Adobe® Photoshop® CS2

Photoshop JavaScript Reference

Adobe

Adobe® Creative Suite 2 Photoshop® JavaScript Scripting Reference for Windows® and Macintosh®.

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Contents

1 Introduction

This reference describes the objects and commands in the Adobe® Photoshop® CS2 JavaScript type library. A companion document, Photoshop CS2 Scripting Guide, describes basic scripting concepts and the Photoshop object model. This document provides reference details of the Photoshop object model, and additional information on JavaScript-specific features.

Adobe Photoshop CS2 uses ExtendScript, Adobe's extended implementation of JavaScript. See Script Support in Adobe Photoshop CS2 for additional information.

This book contains the following sections:

- This introduction, which describes scripting support in Adobe Photoshop CS2, and lists changes to the JavaScript interface since the previous release.
- JavaScript Object Reference, which provides a complete reference for all Photoshop DOM objects and commands.
- Using ScriptUI, which describes how to use ScriptUI, an ExtendScript component that provides a user-interface model to scripters.
- ScriptUI Object Reference, which provides the reference details of the ScriptUI object model.
- Using File and Folder Objects, which describes ExtendScript's platform-independent representation of files and folders.
- File and Folder Object Reference, which provides a complete reference for the ExtendScript `File` and `Folder` classes.
- Scripting Constants, which lists all enumerations used in the Photoshop type library.
- ExtendScript Tools and Features, which describes ExtendScript's debugging tools and programming utilities.

Script Support in Adobe Photoshop CS2

The Scripts menu supports JavaScript scripts for Windows®.

For a file to be recognized by Photoshop as a valid script file it must have the correct file name extension:

Script Type	File Type	Extension	Platform
AppleScript	compiled script OSAS file	`.scpt` (none)	Mac OS®
JavaScript ExtendScript	text	`.js` `.jsx`	Mac OS & Windows
VBScript	text	`.vbs`	Windows
Visual Basic	executable	`.exe`	Windows

JavaScript support

All of the Adobe Creative Suite 2 applications, including Adobe Photoshop CS2, use ExtendScript, Adobe's extended implementation of JavaScript. ExtendScript files are distinguished by the `.jsx` extension. ExtendScript offers all standard JavaScript features, plus additional features and utilities, such as:

- A debugging environment (the ExtendScript Toolkit)
- A localization utility
- Tools that allow you to combine scripts and direct them to particular applications
- Platform-independent file and folder representation

For details of these and additional features, see Using File and Folder Objects and ExtendScript Tools and Features.

Executing scripts

Adobe Photoshop CS2's interface includes a Scripts menu (**File > Scripts**) which provides quick and easy access to your JavaScripts. Scripts can be listed directly as menu items that run when you select them, or you can navigate to and run any JavaScript in your file system.

If Adobe Photoshop CS2 encounters an error during script execution, it displays the error message.

Installing scripts

To install a JavaScript in the Scripts menu, place it in the Scripts folder (**Photoshop CS2 > Presets > Scripts**). The names of the scripts in the Scripts folder, without the file name extension, will be displayed in the Scripts menu. Any number of scripts may be installed in the Scripts menu.

Scripts added to the Scripts folder while Adobe Photoshop CS2 is running will not appear in the Scripts menu until the next time you launch the application.

You may use sub-folders in the Scripts folder to help organize the scripts in the Scripts menu. Each subfolder will be displayed as a separate submenu containing the scripts in that subfolder.

Executing other scripts

The **Browse** item at the end of the **Scripts** menu (**File > Scripts > Browse**) allows you to execute scripts which are not installed in the Scripts folder. You can also use Browse to select scripts installed in the Scripts folder after the application was last launched.

Selecting **Browse** displays a file browser dialog which allows you to select a script file for execution. Only `.js` or `.jsx` files are displayed in the browse dialog. When you select a script file, it is executed the same way as an installed script.

Startup scripts

On startup, Adobe Photoshop CS2 executes all `.jsx` files that it finds in the startup folders.

- On Windows, the startup folder for user-defined scripts is:

  `%APPDATA%\Adobe\StartupScripts`

- On Mac OS, the startup folder for user-defined scripts is:

```
~/Library/Application Support/Adobe/StartupScripts/
```

If your script is in this main startup folder, it is also executed by all other Adobe Creative Suite 2 applications at startup. If such a script is meant to be executed only by Adobe Photoshop CS2, it must include code such as the following:

```
if( BridgeTalk.appName == "photoshop" ) {
    //continue executing script
}
```

For additional details, see Script Locations and Checking Application Installation.

Changes Since Earlier Versions

The following changes have been made to the JavaScript object model and language support in Adobe Photoshop CS2:

- The following classes have been added to the JavaScript interface:
  - `CameraRawOpenOptions`, which you use to specify options when opening a document in Camera Raw format.
  - `ExportOptionsSaveForWeb`, which you use to optimize documents for the Web.
  - `ContactSheetOptions`, which you use to create and format contact sheets.
  - `BatchOptions`, which you use to specify options for the Batch command.
  - `LensBlurOptions`, which you use to specify options when applying the Lens Blur filter to a layer.
  - `Notifier` and `Notifiers`, which you use to associate a script with an event so that the script executes when the event occurs. For example, you can create a `notifier` object to associate a script with the Photoshop CS2 application opening; whenever the application opens, the script runs.
- Support for interapplication communication among Creative Suite 2 applications through exported ExtendScript functions and interapplication messaging. For details, see the *Creative Suite 2 Bridge JavaScript Reference*.
- Support for the ExtendScript Toolkit and other ExtendScript features and utilities. See ExtendScript Tools and Features.

Changes in ScriptUI

The ScriptUI component of JavaScript has been updated and extended in this release, and some features are incompatible with the CS version.

- In Photoshop CS, panel coordinates were measured from outside the frame (including the title bar), but in Photoshop CS2, panel coordinates are measured from the inside the frame (the content area). This means that if you use the same values to set the vertical positions of child controls in a panel, the positions are slightly different in the two versions. When you add a panel to a window, you can choose to set a creation property (`su1PanelCoordinates`), which causes that panel to automatically adjust the positions of its children. When automatic adjustment is enabled, you provide position values that were correct for Photoshop CS, and the result is the same in Photoshop CS2. You can also set automatic adjustment for a window; in this case, it applies to all child panels of that window unless it is explicitly disabled in the child panel.
- In CS you could define an `onClick` event handler function for a `StaticText` element, and the function would be invoked when you click on the text. This is not supported in CS2.

- In Photoshop CS, if a ScriptUI dialog contained one or more `edittext` control elements, keyboard focus was automatically assigned to the first-created `edittext` field. For example, when Photoshop CS runs the following script, focus is assigned to `w.name`, and the content of that control (the string 'Jane Doe') is highlighted.

```
var w = new Window ('dialog', 'Sample dialog', [0, 0, 180, 110]);
w.add ('statictext', [15, 15, 65, 35], 'Name:');
w.name = w.add ('edittext', [70, 15, 165, 35], 'Jane Doe');
w.add ('statictext', [15, 45, 65, 65], 'Address:');
w.addr = w.add ('edittext', [70, 45, 165, 65], 'Notes');
w.ok = w.add ('button', [40, 75, 140, 95], 'OK', { name:'ok' });
w.center();
var ok = w.show() == 1;
```

  In Photoshop CS2, the keyboard focus is not automatically assigned to any control element. The script must specify which control, if any, should have the focus, by setting its `active` property to `true`. For example, you must change the previous script as follows to explicitly assign focus to the `w.name` field:

```
var w = new Window ('dialog', 'Sample dialog', [0, 0, 180, 110]);
w.add ('statictext', [15, 15, 65, 35], 'Name:');
w.name = w.add ('edittext', [70, 15, 165, 35], 'Jane Doe');
w.name.active = true;
w.add ('statictext', [15, 45, 65, 65], 'Address:');
w.addr = w.add ('edittext', [70, 45, 165, 65], 'Notes');
w.ok = w.add ('button', [40, 75, 140, 95], 'OK', { name:'ok' });
w.center();
var ok = w.show() == 1;
```

2 JavaScript Object Reference

The objects of the JavaScript type library for Adobe® Photoshop® CS2 are presented alphabetically and in tabular format in this chapter.

Object properties and methods are described in separate tables for each object. See Working with the Properties Tables and Working with the Methods Tables for information on how to use these tables.

Sample code for several object model classes is given to help illustrate the syntax as well as usage of the object class.

Working with the Properties Tables

The Properties table for an object lists the following:

- The properties you can use with the object
- The value type for each property

  When the value type is a constant or another object, the value is a hypertext link to the constant's or object's listing, as in the following Properties table sample.
- The property's input status: read-only or read-write.
- A description that explains what the property is

  Descriptions are omitted for self-explanatory properties.

Property	Value Type	What it is
displayDialogs	DialogModes	Read-write. Controls whether or not Adobe Photoshop CS2 displays dialog boxes.

Working with the Methods Tables

The Methods table for an object lists the following:

- The method name
- Parameter(s)

  When a parameter type or return value is a constant or another object, the value is a hypertext link to the constant's or object's listing. In the following Methods table sample, the parameter type `ActionDescriptor` is an object; the parameter type `DialogModes` is a constant; the return value `ActionDescriptor` is also an object.

  Appeasements can be required or optional. Optional parameters are indicated in the table by square brackets ([]). See 'Working with Method Parameters' on page 42 for information on using parameters.
- Return value type(s)
- A description, if applicable

Method	Parameter Type	Returns	What it does
executeAction (eventID [, descriptor] [, displayDialogs])	number (long) ActionDescriptor DialogModes	ActionDescriptor	Plays an ActionManager event.

Working with Method Parameters

Optional parameters are surrounded by square brackets ([ ]). In the following Methods table sample, the parameters descriptor and displayDialogs are optional and the parameter eventID is not. See

Therefore, if you use the executeAction() method for the object associated with the sample Methods table above, you *must* include an eventID value in the parentheses following the method name. The eventID value must be a number, as indicated by the number (long) in the table's Parameter Type column.

If you use an optional parameter, you must separate the parameters with a comma, as indicated by the comma that precedes each optional parameter in the table.

Also, if you use an optional parameter, you must enter the values in the order they are listed in the table so that the JavaScript compiler knows which value you are entering. To skip an optional parameter, insert an extra comma to act as a placeholder.

The following sample provides values for an eventID and a displayDialog, but skips the descriptor parameter (represented by the empty value between two commas). The statement executes action #4233 and allows only error type dialog boxes to be displayed.

```
app.executeAction(4233,,error)
```

ActionDescriptor

A record of key-value pairs for actions, such as those included on the Adobe Photoshop CS2 Actions menu.

Note: The `ActionDescriptor` class is part of the Action Manager functionality. See 'Action Manager' on page 183.

Properties

Property	Value Type	What it is
count	`number (long)`	Read-only. The number of keys contained in the descriptor.
typename	`string`	Read-only. The class name of the referenced `actionDescriptor` object.

Methods

Method	Parameter Type	Returns	What it does
clear ()			Clears the descriptor.
erase (key)	`number (long)`		Erases a key from the descriptor.
fromStream (value)	`string`		Creates a descriptor from a stream of bytes; for reading from disk.
getBoolean (key)	`number (long)`	`boolean`	Gets the value of a key of type boolean.
getClass (key)	`number (long)`	`number (long)`	Gets the value of a key of type class.
getData (key)	`number (long)`	`string`	Gets raw byte data as a string value.
getDouble (key)	`number (long)`	`number (double)`	Gets the value of a key of type double.
getEnumerationType (key)	`number (long)`	`number (long)`	Gets the enumeration type of a key.
getEnumerationValue (key)	`number (long)`	`number (long)`	Gets the enumeration value of a key.
getInteger (key)	`number (long)`	`number (long)`	Gets the value of a key of type integer.
getKey (index)	`number (long)`	`number (long)`	Gets the ID of the *N*th key.
getList (key)	`number (long)`	`ActionList`	Gets the value of a key of type list.

Method	Parameter Type	Returns	What it does (Continued)
getObjectType (key)	number (long)	number (long)	Gets the class ID of an object in a key of type object.
getObjectValue (key)	number (long)	ActionDescriptor	Gets the value of a key of type object.
getPath (key)	number (long)	file	Gets the value of a key of type Alias.
getReference (key)	number (long)	ActionReference	Gets the value of a key of type ActionReference.
getString (key)	number (long)	string	Gets the value of a key of type string.
getType (key)	number (long)	DescValueType	Gets the type of a key.
getUnitDoubleType (key)	number (long)	number (long)	Gets the unit type of a key of type UnitDouble.
getUnitDoubleValue (key)	number (long)	number (double)	Gets the value of a key of type UnitDouble.
hasKey (key)	number (long)	boolean	Checks whether the descriptor contains the provided key.
isEqual (otherDesc)	ActionDescriptor	boolean	Determines whether the descriptor is the same as another descriptor.
putBoolean (key, value)	number (long) boolean		Sets the value for a key whose type is boolean.
putClass (key, value)	number (long) number (long)		Sets the value for a key whose type is class.
putData (key, value)	number (long) string	string	Puts raw byte data as a string value.
putDouble (key, value)	number (long) number (double)		Sets the value for a key whose type is double.
putEnumerated (key, enumType, value)	number (long) number (long) number (long)		Sets the enumeration type and value for a key. See Chapter 8, "Scripting Constants", for information on enumerated types.
putInteger (key, value)	number (long) number (long)		Sets the value for a key whose type is integer.

Method	Parameter Type	Returns	What it does (Continued)
putList (key, value)	number (long) ActionList		Sets the value for a key whose type is an ActionList object.
putObject (key, classID, value)	number (long) number (long) ActionDescriptor		Sets the value for a key whose type is an Action Descriptor.
putPath (key, value)	number (long) file		Sets the value for a key whose type is path.
putReference (key, value)	number (long) ActionReference		Sets the value for a key whose type is an object reference.
putString (key, value)	number (long) string		Sets the value for a key whose type is string.
putUnitDouble (key, unitID, value)	number (long) number (long) number (double)		Sets the value for a key whose type is a unit value formatted as a double.
toStream		string	Gets the entire descriptor as a stream of bytes; for writing from disk.

ActionList

The list of commands that comprise an Action (such as an Action created using the Actions palette in the Adobe Photoshop CS2 application).

Note: The `ActionList` object is part of the Action Manager functionality. For details on using the Action Manager, see 'Action Manager' on page 183.

Properties

Property	Value Type	What it is
count	`number (long)`	Read-only. The number of commands that comprise the action.
typename	`string`	Read-only. The class name of the referenced `ActionList` object.

Methods

With the exception of the `clear()` method, you use the methods of this object to either get the value of a specific type of data in the list or set (put) the value type.

Method	Parameter Type	Returns	What it does
clear `()`			Clears the list.
getBoolean `(index)`	`number (long)`	`boolean`	Gets the value of a list item of type boolean.
getClass `(index)`	`number (long)`	`number (long)`	Gets the value of a list item of type class.
getData `(index)`	`number (long)`	`string`	Gets raw byte data as a string value.
getDouble `(index)`	`number (long)`	`number (double)`	Gets the value of a list item of type double.
getEnumerationType `(index)`	`number (long)`	`number (long)`	Gets the enumeration type of a list item.
getEnumerationValue `(index)`	`number (long)`	`number (long)`	Gets the enumeration value of a list item.
getInteger `(index)`	`number (long)`	`number (long)`	Gets the value of a list item of type integer.
getList `(index)`	`number (long)`	`ActionList`	Gets the value of a list item of type list.
getObjectType `(index)`	`number (long)`	`number (long)`	Gets the class ID of a list item of type object.

Method	Parameter Type	Returns	What it does (Continued)
getObjectValue (index)	number (long)	ActionDescriptor	Gets the value of a list item of type object.
getPath (index)	number (long)	file	Gets the value of a list item of type Alias.
getReference (index)	number (long)	ActionReference	Gets the value of a list item of type ActionReference.
getString (index)	number (long)	string	Gets the value of a list item of type string.
getType (index)	number (long)	DescValueType	Gets the type of a list item.
getUnitDoubleType (index)	number (long)	number (long)	Gets the unit value type of a list item of type Double.
getUnitDoubleValue (index)	number (long)	number (double)	Gets the unit value of a list item of type double.
putBoolean (value)	boolean		Sets the value to either true or false.
putClass (value)	number (long)		Sets the class or data type.
putData (value)	string		Puts raw byte data as a string value.
putDouble (value)	number (double)		Sets the value type as a double.
putEnumerated (enumType, value)	number (long) number (long)		Sets the value type as an enumerated, or constant, value. Both the type of constant and the actual value are required in the following format: *constantType.VALUE* See Chapter 8, "Scripting Constants", for information on constant value types and values.
putInteger (value)	number (long)		Sets the value of a list item of type integer.
putList (value)	ActionList		Sets the value of a list item of type list or array.
putObject (classID, value)	number (long) ActionDescriptor		Sets the value of a list item of type object.
putPath (value)	file		Sets the value of a list item of type path.

Method	Parameter Type	Returns	What it does (Continued)
putReference (value)	ActionReference		Sets the value of a list item whose type a reference to an object created in the script.
putString (value)	string		Sets the value of a list item of type string.
putUnitDouble (classID, value)	number (long) number (double)		Sets the value of a list item of type unit value represented as a double.

ActionReference

Contains data describing a referenced Action.

Note: The `ActionReference` object is part of the Action Manager functionality. For details on using the Action Manager, see 'Action Manager' on page 183.

Properties

Property	Value type	What it does
typename	`string`	Read-only. The class name of the referenced Action object.

Methods

Method	Parameter Type	Returns	What it does
getContainer ()		`ActionReference`	Gets the container object in the containment hierarchy for the object.
getDesiredClass ()		`number (long)`	Gets a number representing the class of the object.
getEnumeratedType ()		`number (long)`	Gets the enumeration type. See Chapter 8, "Scripting Constants", for information on enumeration types and values.
getEnumeratedValue ()		`number (long)`	Gets the enumeration value.
getForm ()		`ReferenceFormType`	Gets the form of an `ActionReference`.
getIdentifier ()		`number (long)`	Gets the identifier value for a reference whose form is identifier.
getIndex ()		`number (long)`	Gets the index value for a reference in a list or array.
getName ()		`string`	Gets the name of a reference.
getOffset ()		`number (long)`	Gets the offset of the object's index value.
getProperty ()		`number (long)`	Gets the property ID value.
putClass (desiredClass)	`number (long)`		Sets the class type of the object. The class name is required.

Method	Parameter Type	Returns	What it does (Continued)
putEnumerated (desiredClass, enumType, value)	number (long) number (long) number (long)		Sets the object's type to 'Enumerated'. The class type, enumeration type and actual enumeration value are required in the following format: ***classtype.enumerationType .VALUE***
putIdentifier (desiredClass, value)	number (long) number (long)		Sets the value of the identifier.
putIndex (desiredClass, value)	number (long) number (long)		Sets the object's index value in a list.
putName (desiredClass, value)	number (long) string		Sets the object's name.
putOffset (desiredClass, value)	number (long) number (long)		Sets the object's offset from the current object.
putProperty (desiredClass, value)	number (long) number (long)		Sets the value of the object's property.

Application

The Adobe Adobe Photoshop CS2 application object, which contains all other Adobe Photoshop CS2 objects.

Note: Because you open JavaScripts through the application itself, you do not need to use the `Application` object as part of the containment hierarchy that describes an object.

However, if you choose to include the `Application` object in your code, you must use the pre-defined global object name `app`, rather than the class name `Application`, in a script, as in the following sample:

```
var docRef = app.documents.add(800, 600, 72, "docRef", NewDocumentMode.RGB)
```

The following sample uses the `Application` object incorrectly:

```
var docRef = Application.documents.add(800, 600, 72, "docRef",
NewDocumentMode.RGB)
```

However, the most common way to add an element in your code is to omit references to the `Application` object altogether, as in the following sample:

```
var docRef = documents.add(800, 600, 72, "docRef", NewDocumentMode.RGB)
```

Properties

Property	Value Type	What it is
activeDocument	Document	Read-write. The frontmost document. (Setting this property is equivalent to clicking an open document in the Adobe Photoshop CS2 application to bring it to the front of the screen.)
backgroundColor	SolidColor	Read-write. The color mode for the document's background color.
colorSettings	String	Read-write. The name of selected color setting's set.
displayDialogs	DialogModes	Read-write. The dialog mode for the document, which indicates whether or not Adobe Photoshop CS2 displays dialogs when the script runs.
documents	Documents	Read-only. The collection of open documents.
fonts	TextFonts	Read-only. The fonts installed on this system.
foregroundColor	SolidColor	Read-write. The default foreground color (used to paint, fill, and stroke selections).
freeMemory	number (double)	Read-only. The amount of unused memory available to Adobe Photoshop CS2.
locale	string	Read-only. The language location of the application.
macintoshFileTypes	array of strings	Read-only. A list of file image types Adobe Photoshop CS2 can open.
name	string	Read-only. The application's name.

Property	Value Type	What it is (Continued)
notifiers	Notifiers	Read-only. The collection of notifiers currently configured (in the Scripts Events Manager menu in the Adobe Photoshop CS2 application).
notifiersEnabled	boolean	Read-write. Indication of whether all notifiers are enabled or disabled.
path	file	Read-only. The full path to the location of the Adobe Photoshop CS2 application.
playbackDisplayDialogs	DialogModes	Read-write. The dialog mode for playback mode, which indicates whether or not Adobe Photoshop CS2 displays dialogs in playback mode.
playbackParameters	ActionDescriptor	Read-write. The playback options, which indicate the speed at which Adobe Photoshop CS2 plays actions.
preferences	Preferences	Read-only. The application preference settings (equivalent to selecting **Edit > Preferences** in the Adobe Photoshop CS2 application in Windows or Photoshop > Preferences in Mac OS).
preferencesFolder	alias	Read-only. The full path to the Preferences folder.
scriptingVersion	string	Read-only. The version of the Scripting interface.
typename	string	Read-only. The class name of the referenced app object.
version	string	Read-only. The version of Adobe Photoshop application you are running.
windowsFileTypes	array of strings	Read-only. A list of file image extensions Adobe Photoshop CS2 can open.

Methods

Method	Parameter Type	Returns	What it does
batch (inputFiles, action, from [, options])	array of files string string BatchOptions	string	Runs the batch automation routine **(similar to the Batch command, or File > Automate > Batch in the** Adobe Photoshop CS2 application). **Note:** The inputFiles parameter specifies the source for the files to be manipulated by the Batch command.
beep ()			Causes a "beep" sound.
bringToFront			Makes Adobe Photoshop CS2 the active (front-most) application.
charIDToTypeID (charID)	string	number (long)	Converts from a four character code (character ID) to a runtime ID.
doAction (action, from)	string string		Plays an action from the Actions palette.
executeAction (eventID [, descriptor] [, displayDialogs])	number (long) ActionDescriptor DialogModes	ActionDescriptor	Plays an ActionManager event.
executeActionGet (reference)	ActionReference	ActionDescriptor	Obtains an ActionDescriptor.
load (document)	file		Loads the support document from the specified location.
makeContactSheet (inputFiles [, options])	array of files ContactSheetOptions	string	Creates a contact sheet from the specified files.
makePDFPresentation (inputFiles outputFiles [, options])	array of files file PresentationOptions	string	Creates an Adobe PDF presentation file from the specified input files.
makePhotoGallery (inputFolder outputFolder [, options])	file file GalleryOptions	string	Creates a web photo gallery from the files in the specified input folder.

Method	Parameter Type	Returns	What it does (Continued)
makePhotomerge (inputFiles)	array of files	string	Merges multiple files into one; user interaction required.
makePicturePackage (inputFiles [, options])	array of files PicturePackageOptions	string	Creates a picture package from the specified input files.
open (document [, as])	file object object (open options) **Note:** See individual file type open options, such as CameraRawOpenOptions or EPSOpenOptions, etc.	Document	Opens the specified document as the optionally specified file type.
purge (target)	PurgeTarget		Purges one or more caches.
stringIDToTypeID (stringID)	string	number (long)	Converts from a string ID to a runtime ID.
typeIDToCharID (typeID)	number (number (long))	string	Converts from a runtime ID to a character ID.
typeIDToStringID (typeID)	number (number (long))	string	Converts from a runtime ID to a string ID.

First Sample Script

The following script invokes an alert box to display Properties important to an application such as version number, the path to the application, the amount of memory available, and the number of documents open.

When a user presses the OK button on the alert box, a second dialog opens, which asks users whether they would like the foreground and background colors set for the document presently open. If no document is open, the script opens a new document for the user.

The script (with no document open) produces a progression of three dialogs.

Application.jsx

```
//Create a Welcome message
// Use the name and version properties of the application object to
// Append the application's name and version to the Welcome message
// use "\r" to insert a carriage return
// use the combination operator += to append info to the message
var message = "Welcome to " + app.name;
message += " version " + app.version + "\r\r";

// find out where Adobe Photoshop CS2 is installed
// and add the path to the message
```

```
// add the optional parameter fsName to the path property
// to display the file system name in the most common format
message += "I'm installed in " + app.path.fsName + "\r\r"

// see how much memory Adobe Photoshop CS2 has to play with
message += "You have this much memory available for Adobe Photoshop CS2: " +
app.freeMemory + ""\r\r"

// use the length property of the documents object to
// see how many documents are open
var documentsOpen = app.documents.length
message += "You currently have " + documentsOpen + " document(s) open.\r\r"

// display the message to the user
alert(message)

// answer will be true for a "Yes" answer and false for a "No" answer
var answer = confirm("Do you want me to set the foreground and background to my
favorite colors?")

// set the colors
if (answer) {
   // I don't have a favorite color. Why did I ask you may wonder?
   app.foregroundColor.rgb.red = Math.random() * 255
   app.foregroundColor.rgb.green = Math.random() * 255
   app.foregroundColor.rgb.blue = Math.random() * 255

   app.backgroundColor.rgb.red = Math.random() * 255
   app.backgroundColor.rgb.green = Math.random() * 255
   app.backgroundColor.rgb.blue = Math.random() * 255
}

// Open a document
if (app.documentsOpen == 0) {

   // use the application's path and the offset to the samples folder
   var sampleDocToOpen = File(app.path + "/Samples/Eagle.psd")

   // compose a message with the name of the file
   message = "Would you like me to open a sample for you? ("
   message += sampleDocToOpen.fsName
   message += ")"

   // ask the user another question
   answer = confirm(message)

   // open the document accordingly
   if (answer) {
      open(sampleDocToOpen)
   }
}
```

Second Sample Script

The following script presents a progression of images as an Adobe PDF slide show.

PDFPresentation.jsx

```
// use all the files in the Samples folder
var inputFolder = new Folder(app.path + "/Samples/")

// see if we have something interesting
if (inputFolder != null) {

      // get all the files found in this folder that are Adobe Photoshop CS2 (.psd
format)
      var inputFiles = inputFolder.getFiles("*.psd")

      // output to the desktop
      var outputFile = File("~/Desktop/JavaScriptPresentation.pdf")

      // there are defaults but I like to set the options myself
      var options = new PresentationOptions
      options.presentation = true
      options.view = true
      options.autoAdvance = true
      options.interval = 5
      options.loop = true
      options.transition = TransitionType.RANDOM

      // create the presentation
      makePDFPresentation(inputFiles, outputFile, options)
}
```

Note: To run this code on non-English platforms, substitute the following path for the `outputFile` variable:

```
      var outputFile = File("~/JavaScriptPresentation.pdf")
```

ArtLayer

An object within a document that contains the visual elements of the image (equivalent to a layer in the Adobe Photoshop CS2 application).

Note: Most likely, you will use variables to refer to `ArtLayer` objects in your script. However, if you choose not to use a variable, be aware that, because the `ArtLayer` class is also a property of the Document object, you use the object name, `artLayer`, rather than the class name, `ArtLayer`, in your code.

The following example uses correct syntax to refer to an `ArtLayer` object by name and then assign its `allLocked` property value:

```
documents(0).artLayer("my layer").allLocked = true
```

The following example, which uses an upper case *A* in the object name, is incorrect:

```
documents(0).ArtLayer("my layer").allLocked = true
```

Properties

Property	Value Type	What it is
allLocked	`boolean`	Read-write. Indicates whether to completely lock the layer's contents and settings.
blendMode	`BlendMode`	Read-write. The layer's blending mode.
bounds	`Array(UnitValue)`	Read-only. An array of coordinates that describes the bounding rectangle of the layer.
fillOpacity	`number (double)`	Read-write. The interior opacity of the layer (between 0.0 and 100.0).
grouped	`boolean`	Read-write. Indication of whether to group this layer with the layer beneath it.
isBackgroundLayer	`boolean`	Read-write. Indicates whether the layer is a background layer or normal layer. **Note:** A document can have only one background layer.
kind	`LayerKind`	Read-write. Sets the layer's kind (such as 'text layer') for an empty layer. **Note:** Valid only when the layer is empty and when `isBackgroundLayer` is `false`. See isBackgroundLayer. **Note:** You can use the `kind` property to make a background layer a normal layer; however, to make a layer a background layer, you must set `isBackgroundLayer` to `true`.
linkedLayers	`array of layers`	Read-only. The layers linked to this layer. **Note:** See link.

Property	Value Type	What it is (Continued)
name	string	Read-write. The layer's name.
opacity	number (double)	Read-write. The master opacity of the layer (0.0 - 100.0).
parent	object (Document)	Read-only. The object's container.
pixelsLocked	boolean	Read-write. Indicates whether the pixels in the layer's image can be edited using the paintbrush tool.
positionLocked	boolean	Read-write. Indicates whether the pixels in the layer's image can be moved within the layer.
textItem	TextItem	Read-only. The text item that is associated with the layer. **Note:** Valid only when `kind = LayerKind.TEXT`. See kind.
transparentPixelsLocked	boolean	Read-write. Indicates whether editing is confined to the opaque portions of the layer.
typename	string	Read-only. The class name of the referenced `artLayer` object.
visible	boolean	Read-write. Indicates whether the layer is visible.

Methods

Method	Parameter Type	Returns	What it does
adjustBrightnessContrast (brightness, contrast)	number (number (long)) number (number (long))		Adjusts the brightness (-100 - 100) and contrast (-100 - 100).
adjustColorBalance ([shadows] [, midtones] [, highlights] [, preserveLuminosity]	array of integers array of integers array of integers boolean		Adjusts the color balance of the layer's component channels. For `shadows`, `midtones`, and `highlights`, the array must include three values (-100 - 100), which represent cyan or red, magenta or green, and yellow or blue, when the document mode is CMYK or RGB. **Note:** See mode in the Properties table of the `Document` object.
adjustCurves (curveShape)	array of points (Array (Array(x, y)))		Adjusts the tonal range of the selected channel using up to fourteen points.

Method	Parameter Type	Returns	What it does (Continued)
adjustLevels (inputRangeStart, inputRangeEnd, inputRangeGamma, outputRangeStart, outputRangeEnd)	number (long) number (long) number (double) number (long) number (long)		Adjusts the levels of the selected channels (inputRangeStart: 0 - 253; inputRangeEnd: (inputRangeStart + 2) - 255; inputRangeGamma: 0.10 - 9.99; outputRangeStart: 0 - 253; outputRangeEnd: (outputRangeStart + 2) - 255.
applyAddNoise (amount, distribution, monochromatic)	number (double) NoiseDistribution boolean		Applies the Add Noise filter (amount: 0.1% - 400%).
applyAverage ()			Applies the Average filter.
applyBlur ()			Applies the Blur filter.
applyBlurMore ()			Applies the Blur More filter.
applyClouds ()			Applies the Clouds filter.
applyCustomFilter (characteristics, scale, offset)	array of twenty-five numbers (long) number (long) number (long)		Applies a custom filter. **Note:** Required parameter values define the filter. Refer to Adobe Photoshop CS2 Help for specific instructions.
applyDeInterlace (eliminateFields, createFields)	EliminateFields CreateFields		Applies the De-Interlace filter.
applyDespeckle ()			Applies the Despeckle filter.
applyDifferenceClouds ()			Applies the Difference Clouds filter.
applyDiffuseGlow (graininess, glowAmount, clearAmount)	number (long) number (long) number (long)		Applies the Diffuse Glow filter (graininess: 0 - 10; glowAmount: 0 - 20; clearAmount: 0 - 20).
applyDisplace (horizontalScale, verticalScale, displacement, undefinedareas, displacementMapFiles)	number (long) number (long) DisplacementMapType UndefinedAreas file		Applies the Displace filter using the specified horizontal and vertical scale (-999 - 999), mapping type, treatment of undistorted areas, and path to the distortion image map.

Method	Parameter Type	Returns	What it does (Continued)
applyDustAndScratches (radius, threshold)	number (long) number (long)		Applies the Dust & Scratches filter (radius: 1 - 100; threshold: 0 - 255).
applyGaussianBlur (radius)	number (double)		Applies the Gaussian Blur filter within the specified radius (in pixels) (0.1 - 250.0).
applyGlassEffect (distortion, smoothness, scaling [, invert] [, texture] [, textureFile])	number (long) number (long) number (long) boolean TextureType file		Applies the Glass filter (distortion: 0 - 20; smoothness: 1 - 15; scaling (in percent): 50 - 200).
applyHighPass (radius)	number (double)		Applies the High Pass filter within the specified radius (in pixels) (0.1 - 250.0).
applyLensBlur ([options])	LensBlurOptions		Applies the Lens Blur filter.
applyLensFlare (brightness, flareCenter, lensType)	number (long) Array(UnitValue) LensType		Applies the Lens Flare filter with the specified brightness (0 - 300%), the x and y coordinates (unit value) of the flare center, and the lens type.
applyMaximum (radius)	number (double)		Applies the Maximum filter within the specified radius (in pixels) (1 - 100).
applyMedianNoise (radius)	number (double)		Applies the Median Noise filter within the specified radius (in pixels) (1 - 100).
applyMinimum (radius)	number (double)		Applies the Minimum filter within the specified radius (in pixels) (1 - 100).
applyMotionBlur (angle, radius)	number (long) number (double)		Applies the Motion Blur filter (angle: -360 - 360; radius: 1 - 999).
applyNTSC ()			Applies the NTSC colors filter.
applyOceanRipple (size, magnitude)	number (long) number (long)		Applies the Ocean Ripple filter in the specified size (1 - 15) and magnitude (0 - 20).

Method	Parameter Type	Returns	What it does (Continued)
applyOffset (horizontal, vertical, undefinedAreas)	UnitValue UnitValue OffsetUndefinedAreas		Moves the layer the specified amount horizontally and vertically (min/max amounts depend on layer size), leaving an undefined area at the layer's original location.
applyPinch (amount)	number (long)		Applies the Pinch filter in the specified amount (as a percentage) (-100 - 100).
applyPolarCoordinates (conversion)	PolarConversionType		Applies the Polar Coordinates filter.
applyRadialBlur (amount, blurMethod, blurQuality)	number (long) RadialBlurMethod RadialBlurQuality		Applies the Radial Blur filter in the specified amount (1 - 100) using either a spin or zoom effect and the specified quality.
applyRipple (amount, size)	number (long) RippleSize		Applies the Ripple filter in the specified amount (-999 to 999) throughout the image and in the specified size.
applySharpen ()			Applies the Sharpen filter.
applySharpenEdges ()			Applies the Sharpen Edges filter.
applySharpenMore ()			Applies the Sharpen More filter.
applyShear (curve, undefinedAreas)	array of points (Array (Array(x, y))) UndefinedAreas		Applies the Shear filter (curve: 2 - 255 points).
applySmartBlur (radius, threshold, blurQuality, mode)	number (double) number (double) SmartBlurQuality SmartBlurMode		Applies the smart blur filter (radius: 0.1 - 100.0; threshold: 0.1 - 100.0).
applySpherize (amount, mode)	number (long) SpherizeMode		Applies the Spherize filter in the specified amount (as percentage) (-100 - 100).
applyStyle (styleName)	string		Applies the specified style to the layer. **Note:** You must use a style from the Styles list in the Layer Style dialog.

Method	Parameter Type	Returns	What it does (Continued)
applyTextureFill (textureFile)	file		Applies the Texture Fill filter.
applyTwirl (angle)	number (long)		Applies the Twirl filter at the specified angle (-999 - 999).
applyUnSharpMask (amount, radius, threshold)	number (double) number (double) number (long)		Applies the Unsharp Mask filter (amount: 1 - 500 as percent; radius: 0.1 - 250.00; threshold: 0 - 255).
applyWave (generatorNumber, minimumWavelength, maximumWavelength, minimumAmplitude, maximumAmplitude, horizontalScale, verticalScale, waveType, undefinedAreas, randomSeed)	number (long) number (long) number (long) number (long) number (long) number (long) number (long) WaveType UndefinedAreas number (long)		Applies the Wave filter (generatorNumber**: 1 - 999;** minimumWavelength**: 1 - 998;** maximumWavelength**:** **2 -** minimumWavelength + 1**;** minimumAmplitude**: 1 - 998;** maximumAmplitude**:** **2 -** minimumAmplitude + 1**;** horizontalScale**: 1% - 100%;** verticalScale**: 1% - 100%**).
applyZigZag (amount, ridges, style)	number (long) number (long) ZigZagType		Applies the Zigzag filter (amount: -100 - 100; ridges: 0 - 20).
autoContrast ()			Adjusts the contrast of the selected channels automatically.
autoLevels ()			Adjusts the levels of the selected channels using the auto levels option.
clear ()			Cuts the layer without moving it to the clipboard.
copy ([merge])	boolean		Copies the layer to the clipboard. When the optional argument is set to true, a merged copy is performed (that is, all visible layers are copied to the clipboard).
cut ()			Cuts the layer to the clipboard.
desaturate ()			Converts a color image to a grayscale image in the current color mode by assigning equal values of each component color to each pixel.

Method	Parameter Type	Returns	What it does (Continued)
duplicate ([relativeObject] [, insertionLocation])	object (Layer) ElementPlacement	object (Layer)	Creates a duplicate of the object on the screen.
equalize ()			Redistributes the brightness values of pixels in an image to more evenly represent the entire range of brightness levels within the image.
invert ()			Inverts the colors in the layer by converting the brightness value of each pixel in the channels to the inverse value on the 256-step color-values scale.
link (with)	object (Layer)		Links the layer with the specified layer.
merge ()		ArtLayer	Merges the layer down, removing the layer from the document; returns a reference to the art layer that this layer is merged into.
mixChannels (outputChannels [, monochrome])	array of array of numbers (double) boolean		Modifies a targeted (output) color channel using a mix of the existing color channels in the image. (outputChannels = An array of channel specifications. For each component channel, specify a list of adjustment values (-200 - 200) followed by a 'constant' value (-200 - 200).) **Note:** When monochrome = true, the maximum number of channel value specifications is 1. **Note:** Valid only when document.mode = DocumentMode.RGB or document.mode = DocumentMode.CMYK. **Note:** RGB arrays must include four doubles. CMYK arrays must include five doubles.

Method	Parameter Type	Returns	What it does (Continued)
move (relativeObject, insertionLocation)	object (artLayer or layerSet) ElementPlacement		Moves the layer relative to the object specified in parameters. **Note:** For art layers, only the constant values ElementPlacement.PLACEBEFORE and ElementPlacement.PLACEATEND are valid. For layer sets, only the constant values ElementPlacement.PLACEBEFORE and ElementPlacement.INSIDE are valid.
photoFilter ([fillColor] [, density] [, preserveLuminosity])	SolidColor number (long) boolean		Adjust the layer's color balance and temperature as if a color filter had been applied (density: 1% - 100%).
posterize (levels)	number (long)		Specifies the number of tonal levels (2 - 255) for each channel and then maps pixels to the closest matching level.
rasterize (target)	RasterizeType		Converts the targeted contents in the layer into a flat, raster image.
remove ()			Deletes the object.
resize ([horizontal] [, vertical] [, anchor])	number (double) number (double) AnchorPosition		Resizes the layer to the specified dimensions (as a percentage of its current size) and places it in the specified position.
rotate (angle [, anchor])	number (double) AnchorPosition		Rotates rotates the layer around the specified anchor point (default: AnchorPosition.MIDDLECENTER).

Method	Parameter Type	Returns	What it does (Continued)
selectiveColor (selectionMethod [, reds] [, yellows] [, greens] [, cyans] [, blues] [, magentas] [, whites] [, neutrals] [, blacks])	AdjustmentReference array of numbers (long) array of numbers (long) array of numbers (long) array of numbers (long) array of numbers (long) array of numbers (long) array of numbers (long) array of numbers (long) array of numbers (long)		Modifies the amount of a process color in a specified primary color without affecting the other primary colors. **Note:** Each color array must have four components.
shadowHighlight ([shadowAmount] [, shadowWidth] [, shadowRadius] [, highlightAmount] [, highlightWidth] [, highlightRadius] [, colorCorrection] [, midtoneContrast] [, blackClip] [, whiteClip])	number (long) number (long) number (long) number (long) number (long) number (long) number (long) number (long) number (double) number (double)		Adjusts the range of tones in the image's shadows and highlights (shadowAmount: 0 - 100 as percent; shadowWidth: 0 - 100 as percent; shadowRadius: 0 - 2500 in pixels; highlightAmount: 0 - 100 as percent; highlightWidth: 0 - 100 as percent; highlightRadius: 0 - 2500 in pixels; colorCorrection: -100 - 100; midtoneContrast: -100 - 100; blackClip: 0.000 - 50.000; whiteClip: 0.000 - 50.000).
threshold (level)	number (long)		Converts grayscale or color images to high-contrast, B/W images by converting pixels lighter than the specified threshold to white and pixels darker than the threshold to black (level: 1 - 255).
translate ([deltaX] [, deltaY])	UnitValue UnitValue		Moves the layer the specified amount (in pixels) relative to its current position.
unlink ()			Unlinks the layer.

Sample Script

The following script creates art layers to display a duck and a sand dune in an overlying checkerboard pattern. An alert box prompts the user to press OK. A multi-layered collage then displays.

ArtLayer.jsx

```
// Save the current preferences
var startRulerUnits = app.preferences.rulerUnits
var startTypeUnits = app.preferences.typeUnits
var startDisplayDialogs = app.displayDialogs
```

```
// Set Adobe Photoshop CS2 to use pixels and display no dialogs
app.preferences.rulerUnits = Units.PIXELS
app.preferences.typeUnits = TypeUnits.PIXELS
app.displayDialogs = DialogModes.NO

//Close all the open documents
 while (app.documents.length) {
   app.activeDocument.close()
}

// Create a new document to merge all the samples into
var mergedDoc = app.documents.add(1000, 1000, 72, "Merged Samples",
NewDocumentMode.RGB, DocumentFill.TRANSPARENT, 1)

// Use the path to the application and append the samples folder
var samplesFolder = Folder(app.path + "/Samples/")

//Get all the files in the folder
var fileList = samplesFolder.getFiles()

// open each file
for (var i = 0; i < fileList.length; i++) {
   // The fileList is folders and files so open only files
   if (fileList[i] instanceof File) {
          open(fileList[i])

          // use the document name for the layer name in the merged document
          var docName = app.activeDocument.name

          // flatten the document so we get everything and then copy
          app.activeDocument.flatten()
          app.activeDocument.selection.selectAll()
          app.activeDocument.selection.copy()

          // don't save anything we did
          app.activeDocument.close(SaveOptions.DONOTSAVECHANGES)

          // make a random selection on the document to paste into
          // by dividing the document up in 4 quadrants and pasting
          // into one of them by selecting that area
          var topLeftH = Math.floor(Math.random() * 2)
          var topLeftV = Math.floor(Math.random() * 2)
          var docH = app.activeDocument.width.value / 2
          var docV = app.activeDocument.height.value / 2
          var selRegion = Array(Array(topLeftH * docH, topLeftV * docV),
              Array(topLeftH * docH + docH, topLeftV * docV),
              Array(topLeftH * docH + docH, topLeftV * docV + docV),
              Array(topLeftH * docH, topLeftV * docV + docV),
              Array(topLeftH * docH, topLeftV * docV))
          app.activeDocument.selection.select(selRegion)
          app.activeDocument.paste()

          // change the layer name and opacity
          app.activeDocument.activeLayer.name = docName
          app.activeDocument.activeLayer.fillOpacity = 50
   }
}

// sort the layers by name
```

```
for (var x = 0; x < app.activeDocument.layers.length; x++) {
   for (var y = 0; y < app.activeDocument.layers.length - 1 - x; y++) {
          // Compare in a non-case sensitive way
          var doc1 = app.activeDocument.layers[y].name
          var doc2 = app.activeDocument.layers[y + 1].name
          if (doc1.toUpperCase() > doc2.toUpperCase()) {
              app.activeDocument.layers[y].move(app.activeDocument.layers[y+1],
                  ElementPlacement.PLACEAFTER)
      }
   }
}

// Reset the application preferences
app.preferences.rulerUnits = startRulerUnits
app.preferences.typeUnits = startTypeUnits
app.displayDialogs = startDisplayDialogs
```

ArtLayers

The collection of `artLayer` objects in the document.

Note: Because the `ArtLayers` class is a property of the Document object, you use the object name, `artLayers`, rather than the class name, `ArtLayers`, in your code. For example:

```
var layerRef = docRef.artLayers.add()
```

The following sample uses the `ArtLayers` object incorrectly:

```
var layerRef = docRef.ArtLayers.add()
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `artLayers` collection.
parent	object (document)	Read-only. The object's container.
typename	string	Read-only. The class name of the referenced `artLayers` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	ArtLayer	Gets an element from the `artLayers` collection.
add ()		ArtLayer	Creates a new `artLayer` in the document.
getByName (name)	string	ArtLayer	Get the first element in the `artLayers` collection with the provided name.
removeAll ()		Nothing	Removes all elements from the `artLayers` collection.

BatchOptions

Options to specify when running a Batch command.

Note: You specify the batch source folder as the `inputFiles` parameter of the `batch()` method, which is a method of the `Application` class. See 'batch' on page 53. JavaScript supports only folders as sources for batch commands.

Properties

Property	Value type	What it is
destination	BatchDestinationType	Read-write. The type of destination for the processed files (default: `BatchDestinationType.NODESTINATION`).
destinationFolder	`file`	Read-write. The folder location for the processed files. **Note:** Valid only when `destination = BatchDestinationType.FOLDER`. See destination.
errorFile	`file`	Read-write. The file in which to log errors encountered. **Note:** To display errors on the screen (and stop batch processing when errors occur) leave blank.
fileNaming	`Array (FileNamingType options)`	Read-write. A list of file naming options (maximum: 6). **Note:** Valid only when `destination = BatchDestinationType.FOLDER`. See destination.
macintoshCompatible	`boolean`	Read-write. Indication of whether to make the final file names Macintosh compatible (default: `true`). **Note:** Valid only when `destination = BatchDestinationType.FOLDER`. See destination.
overrideOpen	`boolean`	Read-write. Indication of whether to override action open commands (default: `false`).

Property	Value type	What it is (Continued)
overrideSave	boolean	Read-write. Indication of whether to override save as action steps with the specified destination (default: false). **Note:** Valid only when destination = BatchDestinationType.FOLDER or destination = BatchDestinationType.SAVEANDCLOSE. See destination.
startingSerial	number (long)	Read-write. The starting serial number to use in naming files (default: 1). **Note:** Valid only when destination = BatchDestinationType.FOLDER. See destination.
suppressOpen	boolean	Read-write. Indication of whether to suppress the file open options dialogs (default: false).
suppressProfile	boolean	Read-write. Indication of whether to suppress the color profile warnings (default: false).
typename	string	Read-only. The class name of the referenced batchOptions object.
unixCompatible	boolean	Read-write. Indication of whether to make the final file name Unix compatible (default: true). **Note:** Valid only when destination = BatchDestinationType.FOLDER. See destination.
windowsCompatible	boolean	Read-write. Indication of whether to make the final file names Windows compatible (default: true). **Note:** Valid only when destination = BatchDestinationType.FOLDER. See destination.

BitmapConversionOptions

Options to be specified when converting an image to Bitmap mode.

Note: Convert color images to grayscale before converting the image to bitmap mode. See 'desaturate' on page 62 (in the Methods table of the `ArtLayer` object).

Properties

Property	Value Type	What it is
angle	`number (double)`	Read-write. The angle (in degrees) at which to orient individual dots (-180 - 180). See shape. **Note:** Valid only when `method = BitmapConversionType.HALFTONESCREEN`. See method.
frequency	`number (double)`	Read-write. The number of printer dots (per inch) to use (1.0 - 999.99). **Note:** Valid only when `method = BitmapConversionType.HALFTONESCREEN`. See method.
method	`BitmapConversionType`	Read-write. The conversion method to use (default: `BitmapConversionType.DIFFUSIONDITHER`).
patternName	`string`	Read-write. The name of the pattern to use. **Note:** Valid only when `method = BitmapConversionType.CUSTOMPATTERN`. See method.
resolution	`number (double)`	Read-write. The output resolution in pixels per inch (default: `72.0`).
shape	`BitmapHalfToneType`	Read-write. The dot shape to use. **Note:** Valid only when `method = BitmapConversionType.HALFTONESCREEN`. See method.
typename	`string`	Read-only. The class name of the referenced `bitmapConversionOptions` object.

BMPSaveOptions

Options that can be specified when saving a document in BMP format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
depth	BMPDepthType	Read-write. The number of bits per channel.
flipRowOrder	boolean	Read-write. Indication of whether to write the image from top to bottom (default: false). **Note:** Available only when osType = OperatingSystem.WINDOWS. See osType.
osType	OperatingSystem	Read-write. The target OS. (default: OperatingSystem.WINDOWS).
rleCompression	boolean	Read-write. Indication of whether to use RLE compression. **Note:** Available only when osType = OperatingSystem.WINDOWS. See osType.
typename	string	Read-only. The class name of the referenced BMPSaveOptions object.

CameraRawOpenOptions

Options that can be specified when opening a document in Camera Raw format.

Properties

Property	Value type	What it is
bitsPerChannel	BitsPerChannelType	Read-write. The number of bits per channel.
blueHue	number (long)	Read-write. The blue hue of the shot (-100 - 100).
blueSaturation	number (long)	Read-write. The blue saturation of the shot (-100 - 100).
brightness	number (long)	Read-write. The brightness of the shot (0 - 150).
chromaticAberrationBY	number (long)	Read-write. The chromatic aberration B/Y of the shot (-100 - 100).
chromaticAberrationRC	number (long)	Read-write. The chromatic aberration R/C of the shot (-100 - 100).
colorNoiseReduction	number (long)	Read-write. The color noise reduction of the shot (0 - 100).
colorSpace	ColorSpaceType	Read-write. The colorspace for the image.
contrast	number (long)	Read-write. The contrast of the shot (-50 - 100).
exposure	number (double)	Read-write. The exposure of the shot (4.0 - 4.0).
greenHue	number (long)	Read-write. The green hue of the shot (-100 - 100).
greenSaturation	number (long)	Read-write. The green saturation of the shot (-100 - 100).
luminanceSmoothing	number (long)	Read-write. The luminance smoothing of the shot (0 - 100).
redHue	number (long)	Read-write. The red hue of the shot (-100 - 100).
redSaturation	number (long)	Read-write. The red saturation of the shot (-100 - 100).
resolution	number (double)	Read-write. The resolution of the document in pixels per inch (1 - 999).
saturation	number (long)	Read-write. The saturation of the shot (-100 - 100).
settings	CameraRAWSettingsType	Read-write. The global settings for all Camera RAW options.
shadows	number (long)	Read-write. The shadows of the shot (0 - 100).

Property	Value type	What it is (Continued)
shadowTint	number (long)	Read-write. The shadow tint of the shot (-100 - 100).
sharpness	number (long)	Read-write. The sharpness of the shot (0 - 100).
size	CameraRAWSize	Read-write. The size of the new document.
temperature	number (long)	Read-write. The temperature of the shot (2000 - 50000).
tint	number (long)	Read-write. The tint of the shot (-150 - 150).
typename	string	Read-only. The class name of the referenced cameraRawOpenOptions object.
vignettingAmount	number (long)	Read-write. The vignetting amount of the shot (-100 - 100).
vignettingMidpoint	number (long)	Read-write. The vignetting mid point of the shot (-100 - 100).
whiteBalance	WhiteBalanceType	Read-write. The white balance options for the image.

Channel

Object that stores information about a color element in the image, analogous to a plate in the printing process that applies a single color. The document's color mode determines the number of default channels; for example, an RGB document has four default channels:

- A composite channel: RGB
- Three component channels: red, green, blue

A channel can also be an alpha channel, which stores selections as masks, or a spot channel, which stores spot colors.

Note: Most likely, you will use variables to refer to `Channel` objects in your script. However, if you choose not to use a variable, be aware that, because the `Channel` class is also a property of the Document object, you use the object name, `channel`, rather than the class name, `Channel`, in your code.

The following example uses correct syntax to refer to a `Channel` object by name and then assign its `opacity` property value:

```
documents(0).channel("my channelr").opacity = 22
```

The following example, which uses an upper case *C* in the object name, is incorrect:

```
documents(0).Channel("my channelr").opacity = 22
```

Properties

Property	Value Type	What it is
color	SolidColor	Read-write. The color of the channel. **Note:** Not valid when `type = ChannelType.COMPONENT`.
histogram	array of 256 numbers (long)	Read-only. A histogram of the color of the channel. **Note:** Not valid when `type = ChannelType.COMPONENT`. For component channel histogram values, use the `histogram` property of the `document` object instead. See histogram.
kind	ChannelType	Read-write. The channel type.
name	string	Read-write. The channel's name.
opacity	number (double)	Read-write. The opacity to use for alpha channels or the solidity to use for spot channels (0 - 100). **Note:** Valid only when `type = ChannelType.MASKEDAREA` or `type = ChannelType.SELECTEDAREA`.
parent	object (document)	Read-only. The object's container.

Property	Value Type	What it is (Continued)
typename	string	Read-only. The class name of the referenced channel object.
visible	boolean	Read-write. Indicates whether the channel is visible.

Methods

Method	Parameter Type	Returns	What it does
duplicate ([targetDocument])	Document	Channel	Duplicates the channel.
merge ()			Merges a spot channel into the component channels.
delete ()			Deletes the channel.

Channels

The collection of `channel` objects in the document. See `Channel`.

Note: Because the `Channels` class is also a property of the Document object, you use the object name, `channels`, rather than the class name, `Channels`, in your code. For example:

```
var channelRef = docRef.channels.add()
```

The following sample uses the `ArtLayer` object incorrectly:

```
var channelRef = docRef.Channels.add()
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `channels` collection.
parent	object (document)	Read-only. The `channels` object's container.
typename	string	Read-only. The class name of the referenced `channels` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	Channel	Gets an element from the `channels` collection.
add ()		Channel	Creates a new `channel` object.
getByName (name)	string	Channel	Get the first element in the `channels` collection with the provided name.
removeAll ()			Removes all `channel` objects from the `channels` collection.

Sample Script

The following script produces a strobe effect, as a progression of dialogs display.

Note: This script contains a switch construction that uses a `break` statement. The `break` statement requires an ending semicolon (:), as in the following sample:

```
break;
```

Histogram.jsx

```
// Save the current preferences
var startRulerUnits = app.preferences.rulerUnits
var startTypeUnits = app.preferences.typeUnits
var startDisplayDialogs = app.displayDialogs
```

```
// Set Adobe Photoshop CS2 to use pixels and display no dialogs
app.preferences.rulerUnits = Units.PIXELS
app.preferences.typeUnits = TypeUnits.PIXELS
app.displayDialogs = DialogModes.NO

// if there are no documents open then try to open a sample file
if (app.documents.length == 0) {
   open(File(app.path + "/Samples/Eagle.psd"))
}

// get a reference to the working document
var docRef = app.activeDocument

// create the output file
// first figure out which kind of line feeds we need
if ($.os.search(/windows/i) != -1) {
   fileLineFeed = "windows"
} else {
   fileLineFeed = "macintosh"
}

// create the output file accordingly
fileOut = new File("~/Desktop/Histogram.log")
fileOut.lineFeed = fileLineFeed
fileOut.open("w", "TEXT", "????")

// write out a header
fileOut.write("Histogram report for " + docRef.name)

// find out how many pixels I have
var totalCount = docRef.width.value * docRef.height.value

// more info to the out file
fileOut.write(" with a total pixel count of " + totalCount + "\n")

// channel indexer
var channelIndex = 0

// remember which channels are currently active
var activeChannels = app.activeDocument.activeChannels

// document histogram only works in these modes
if (docRef.mode == DocumentMode.RGB ||
    docRef.mode == DocumentMode.INDEXEDCOLOR ||
    docRef.mode == DocumentMode.CMYK) {

   // activate the main channels so we can get the documents histogram
   TurnOnDocumentHistogramChannels(docRef)

   // Output the documents histogram
   OutputHistogram(docRef.histogram, "Luminosity", fileOut)
}

// local reference to work from
var myChannels = docRef.channels

// loop through each channel and output the histogram
for (var channelIndex = 0; channelIndex < myChannels.length; channelIndex++) {

   // the channel has to be visible to get a histogram
```

```
   myChannels[channelIndex].visible= true

   // turn off all the other channels
   for (var secondaryIndex = 0; secondaryIndex < myChannels.length;
             secondaryIndex++) {
          if (channelIndex != secondaryIndex) {
             myChannels[secondaryIndex].visible= false
      }
   }

   // Use the function to dump the histogram
   OutputHistogram(myChannels[channelIndex].histogram,
          myChannels[channelIndex].name, fileOut)
}

// close down the output file
fileOut.close()

// reset the active channels
docRef.activeChannels = activeChannels

// Reset the application preferences
app.preferences.rulerUnits = startRulerUnits
app.preferences.typeUnits = startTypeUnits
app.displayDialogs = startDisplayDialogs


// Utility function that takes a histogram and name
// and dumps to the output file
function OutputHistogram(inHistogram, inHistogramName, inOutFile) {

   // find ouch which count has the largest number
   // I scale everything to this number for the output
   var largestCount = 0

   // a simple indexer I can reuse
   var histogramIndex = 0

   // see how many samples we have total
   var histogramCount = 0

   // search through all and find the largest single item
   for (histogramIndex = 0; histogramIndex < inHistogram.length;
             histogramIndex++) {
          histogramCount += inHistogram[histogramIndex]
          if (inHistogram[histogramIndex] > largestCount)
             largestCount = inHistogram[histogramIndex]
   }

   // These should match
   if (histogramCount != totalCount) {
          alert("Something bad is happening!")
   }

   // see how much each "X" is going to count as
   var pixelsPerX = largestCount / 100

   // output this data to the file
   inOutFile.write("One X = " + pixelsPerX + " pixels.\n")
```

```
    // output the name of this histogram
    inOutFile.write(inHistogramName + "\n")

    // loop through all the items and output in the following format
    // 001
    // 002
    for (histogramIndex = 0; histogramIndex < inHistogram.length;
              histogramIndex++) {

           // I need an extra "0" for this line item to keep everything in line
           if (histogramIndex < 10)
               inOutFile.write("0")

           // I need an extra "0" for this line item to keep everything in line
           if (histogramIndex < 100)
               inOutFile.write("0")

           // output the index to file
           inOutFile.write(histogramIndex)

           // some spacing to make it look nice
           inOutFile.write(" ")

           // figure out how many X's I need
           var outputX = inHistogram[histogramIndex] / largestCount * 100

           // output the X's
           for (var a = 0; a < outputX; a++)
               inOutFile.write("X")

           inOutFile.write("\n")
    }

    inOutFile.write("\n")
}

// Function to active all the channels according to the documents mode
// Takes a document reference for input
function TurnOnDocumentHistogramChannels(inDocument) {

    // see how many channels we need to activate
    var visibleChannelCount = 0

    // based on the mode of the document
    switch (inDocument.mode) {

           case DocumentMode.BITMAP:
           case DocumentMode.GRAYSCALE:
           case DocumentMode.INDEXEDCOLOR:
               visibleChannelCount = 1
               break;

           case DocumentMode.DUOTONE:
               visibleChannelCount = 2
               break;

           case DocumentMode.RGB:
           case DocumentMode.LAB:
               visibleChannelCount = 3
               break;
```

```
            case DocumentMode.CMYK:
                visibleChannelCount = 4
                break;

            case DocumentMode.DUOTONE:
                visibleChannelCount = 4
                break;

            case DocumentMode.MULTICHANNEL:
            default:
                visibleChannelCount = inDocument.channels.length + 1
                break;
    }

    // now get the channels to activate into a local array
    var aChannelArray = new Array()

    // index for the active channels array
    var aChannelIndex = 0

    for(var channelIndex = 0; channelIndex < inDocument.channels.length;
                channelIndex++) {
            if (channelIndex < visibleChannelCount) {
                aChannelArray[aChannelIndex++] = inDocument.channels[channelIndex]
        }
    }

    // now activate them
    inDocument.activeChannels = aChannelArray

}
```

CMYKColor

The definition of a CMYK color.

Properties

Property	Value Type	What it is
black	number (double)	Read-write. The black color value (as percent) (0.0 - 100.0).
cyan	number (double)	Read-write. The cyan color value (as percent) (0.0 - 100.0).
magenta	number (double)	Read-write. The magenta color value (as percent) (0.0 - 100.0).
typename	string	Read-only. The class name of the referenced CMYKColor object.
yellow	number (double)	Read-write. The yellow color value (as percent) (0.0 - 100.0).

ContactSheetOptions

Options that can be specified for a contact sheet.

Properties

Property	Value Type	What it is
acrossFirst	boolean	Read-write. Indication of whether to place the images horizontally (left to right, then top to bottom) first (default: true).
bestFit	boolean	Read-write. Indication of whether to rotate images for the best fit (default: false).
caption	boolean	Read-write. Indication of whether to use the filename as a caption for the image (default: true).
columnCount	number (long)	Read-write. The number of columns to include (1 - 100; default: 5).
flatten	boolean	Read-write. Indication of whether to flatten all layers in the final document (default: true).
font	GalleryFontType	Read-write. The font used for the caption (default: GalleryFontType.ARIAL).
fontSize	number (long)	Read-write. The font size to use for the caption (default: 12).
height	number (long)	Read-write. The height (in pixels) of the resulting document (100 - 2900; default: 720).
horizontal	number (long)	Read-write. The horizontal spacing (in pixels) between images (0 - 29000; default: 1).
mode	NewDocumentMode	Read-write. The document color mode (default: NewDocumentMode.RGB).
resolution	number (double)	Read-write. The resolution of the document in pixels per inch (35 - 1200; default: 72.0).
rowCount	number (long)	Read-write. The number of rows to use (1 - 100; default: 6).
typename	string	Read-only. The class name of the referenced contactSheetOptions object.
useAutoSpacing	boolean	Read-write. Indication of whether to auto space the images (default: true).

Property	Value Type	What it is (Continued)
vertical	number (long)	Read-write. The vertical spacing (in pixels) between images (0 - 29000; default: 1). **Note:** Valid only when useAutoSpacing = false.
width	number (long)	Read-write. The width (in pixels) of the resulting document (100 - 2900; default: 576).

DCS1_SaveOptions

Options that can be specified when saving a CMYK document in DCS1 format.

Properties

Property	Value Type	What it is
dCS	DCSType	Read-write. (default: `DCSType.COLORCOMPOSITE`).
embedColorProfile	`boolean`	Read-write. Indication of whether to embed the color profile in the document
encoding	SaveEncoding	Read-write. The type of encoding to use for document (default: `SaveEncoding.BINARY`).
halftoneScreen	`boolean`	Read-write. Indication of whether to include halftone screen (default: `false`).
interpolation	`boolean`	Read-write. Indication of use image interpolation (default: `false`)
preview	Preview	Read-write. The type of preview (default: `Preview.MACOSEIGHTBIT`).
transferFunction	`boolean`	Read-write. Indication of whether to include the Transfer functions to compensate for dot gain between the image and film (default: `false`).
typename	`string`	Read-only. The class name of the referenced `DCS1_SaveOptions` object.
vectorData	`boolean`	Read-write. Indication of whether to include vector data. **Note:** Valid only if the document includes vector data (un-rasterized text).

DCS2_SaveOptions

Options that can be specified when saving a CMYK document in DCS2 format.

Properties

Property	Value Type	What it is
dCS	DCSType	Read-write. The type of composite file to create (default: `DCSType.NOCOMPOSITE`).
embedColorProfile	`boolean`	Read-write. Indication of whether to embed the color profile in the document.
encoding	SaveEncoding	Read-write. The type of encoding to use (default: `SaveEncoding.BINARY`).
halftoneScreen	`boolean`	Read-write. Indication of whether to include the halftone screen (default: `false`).
interpolation	`boolean`	Read-write. Indication of whether to use image interpolation (default: `false`).
multiFileDCS	`boolean`	Read-write. Indication of whether to save color channels as multiple files or a single file (default: `false`).
preview	Preview	Read-write. The preview type (default: `Preview.MACOSEIGHTBIT`).
spotColors	`boolean`	Read-write. Indication of whether to save spot colors.
transferFunction	`boolean`	Read-write. Indication of whether to include the Transfer functions to compensate for dot gain between the image and film (default: `false`).
typename	`string`	Read-only. The class name of the referenced `DCS2_SaveOptions` object.
vectorData	`boolean`	Read-write. Indication of whether to include vector data. **Note:** Valid only if the document includes vector data (un-rasterized text).

Document

The active containment object for layers and all other objects in the script; the basic canvas for the file.

Note: In Adobe Photoshop CS2, a document can also be referred to as an image or a canvas.

- The term *image* refers to the entire document and its contents. You can trim or crop an image. You resize an image using the `resizeImage()` method.
- The term *canvas* refers to the space in which the document sits on the screen. You can rotate or flip the canvas. You resize the canvas using the `resizeCanvas()` method.

Note: Most likely, you will use variables to refer to `Document` objects in your script. However, if you choose not to use a variable, be aware that, because the `Document` class is also a property of the Application object, you use the object name, `document`, rather than the class name, `Document`, in your code.

The following example uses correct syntax to refer to a `Document` object by name and then assign its `colorProfileType` property value:

```
document("my document").colorProfileType = ColorProfile.CUSTOM
```

The following example, which uses an upper case *D* in the object name, is incorrect:

```
Document("my document").colorProfileType = ColorProfile.CUSTOM
```

Properties

Property	Value Type	What it is
activeChannels	`Array (Channel objects)`	Read-write. The selected channels.
activeHistoryBrushSource	`HistoryState`	Read-write. The history state to use with the history brush.
activeHistoryState	`HistoryState`	Read-write. The selected `HistoryState` object.
activeLayer	`object (layer)`	Read-write. The selected layer.
artLayers	`ArtLayers`	Read-only. The `artLayers` collection.
backgroundLayer	`ArtLayer`	Read-only. Indicates whether the layer is a background layer.
bitsPerChannel	`BitsPerChannelType`	Read-write. The number of bits per channel.
channels	`Channels`	Read-write. The `channels` collection.
colorProfileName	`string`	Read-write. The name of the color profile. **Note:** Valid only when `colorProfileType = ColorProfile.CUSTOM` or `colorProfileType = ColorProfile.WORKING`. See colorProfileType.
colorProfileType	`ColorProfile`	Read-write. The type of color model that defines the document's working space.

Property	Value Type	What it is (Continued)
componentChannels	Array (Channel objects)	Read-only. A list of the component color channels.
fullName	file	Read-only. The full path name of the document.
height	UnitValue	Read-only. The height of the document (unit value).
histogram	array of 256 numbers (long)	Read-only. A histogram showing the number of pixels at each color intensity level for the composite channel. **Note:** Valid only when `mode = DocumentMode.RGB`; `mode = DocumentMode.CMYK`; or `mode = DocumentMode.INDEXEDCOLOR`. See mode.
historyStates	HistoryStates	Read-only. The `HistoryStates` collection.
info	DocumentInfo	Read-only. Metadata about the document.
layerComps	LayerComp	Read-only. The `LayerComps` collection.
layers	Layers	Read-only. The `Layers` collection.
layerSets	LayerSets	Read-only. The `LayerSets` collection.
managed	boolean	Read-only. Indicates whether the document a is workgroup document.
mode	DocumentMode	Read-only. The color profile.
name	string	Read-only. The document's name.
parent	Application	Read-only. The `Document` object's container.
path	file	Read-only. The path to the document.
pathItems	PathItems	Read-only. The `PathItems` collection.
pixelAspectRatio	number (double)	Read-write. The (custom) pixel aspect ratio to use (0.100 - 10.000).
quickMaskMode	boolean	Read-write. Indicates whether the document is in Quick Mask mode.
resolution	number (double)	Read-only. The document's resolution (in pixels per inch).
saved	boolean	Read-only. Indicates whether the document has been saved since the last change.
selection	Selection	Read-only. The selected area of the document.
typename	string	Read-only. The class name of the `Document` object.

Property	Value Type	What it is (Continued)
width	UnitValue	Read-only. The width of the document (unit value).
xmpMetadata	xmpMetadata	Read-only. Camera raw settings for the image. **Note:** Valid only for documents opened in Camera Raw format.

Methods

Method	Parameter Type	Returns	What it does
changeMode (destinationMode [, options])	ChangeMode object (BitmapConversionOptions or IndexedConversionOptions)		Changes the color profile.
close ([saving])	SaveOptions		Closes the document. If any changes have been made, the script presents an alert with three options: save, do not save, prompt to save. The optional parameter specifies a selection in the alert box (default: SaveOptions.PROMPTTOSAVECHANGES).
convertProfile (destinationProfile, intent [, blackPointCompensation] [, dither])	string Intent boolean boolean		Changes the color profile. **Note:** The destinationProfile parameter must be either a string that names the color mode or Working RGB, Working CMYK, Working Gray, Lab Color (meaning one of the working color spaces or Lab color).
crop (bounds [, angle] [, width] [, height])	Array(UnitValue) number (double) UnitValue UnitValue		Crops the document. The first parameter is an array of four coordinates that mark the portion remaining after cropping, in the following order: left, top, right, bottom.
duplicate ()		Document	Creates a duplicate of the document object.
exportDocument (exportIn [, exportAs] [, options])	file ExportType ExportOptionsIllustrator		Exports the document.
flatten ()			Flattens all layers.

Method	Parameter Type	Returns	What it does (Continued)
flipCanvas (direction)	Direction		Flips the image within the canvas in the specified direction.
importAnnotations (file)	file		Imports annotations into the document.
mergeVisibleLayersl ()			Flattens all visible layers in the document.
paste ([intoSelection])	boolean	ArtLayer	Pastes the contents of the clipboard into the document. If the optional argument is set to true and a selection is active, the contents are pasted into the selection.
print ([postScriptEncoding] [, sourceSpace] [, printSpace] [, intent] [blackPointCompensation])	PrintEncoding SourceSpaceType string Intent boolean		Prints the document. **Note:** printSpace specifies the color space for the printer. Valid values are nothing (that is, the same as the source); or Working RGB, Working CMYK, Working Gray, Lab Color (meaning one of the working color spaces or Lab color); or a string specifying a specific colorspace (default: *nothing*).
rasterizeAllLayers ()			Rasterizes all layers.
resizeCanvas ([width] [, height] [, anchor])	UnitValue UnitValue AnchorPosition		Changes the size of the canvas to display more or less of the image but does not change the image size. See resizeImage.
resizeImage ([width] [, height] [, resolution] [, resampleMethod])	UnitValue UnitValue number (double) ResampleMethod		Changes the size of the image.
revealAll ()			Expands the document to show clipped sections.

Method	Parameter Type	Returns	What it does (Continued)
rotateCanvas (angle)	number (double)		Rotates the canvas (including the image) in clockwise direction.
save ()			Saves the document.
saveAs (saveIn [, options] [, asCopy] [, extensionType])	file object (corresponding SaveOptions object*) boolean Extension * Examples: BMPSaveOptions DCS2 SaveOptions JPEGSaveOptions TiffSaveOptions etc.		Saves the document with specified save options.
splitChannels ()		Array (Document objects)	Splits the document channels into separate images.
trap (width)	number (long)		Applies trapping to a CMYK document. **Note:** Valid only when *document*.mode = DocumentMode.CMYK. See mode .
trim ([type] [, top] [, left] [, bottom] [, right])	TrimType boolean boolean boolean boolean		Trims the transparent area around the image on the specified sides of the canvas. **Note:** Default is true for all boolean values.

Sample Script

The following script creates a document that contains two images (an eagle and a duck) obtained from the Adobe Photoshop CS2 Samples folder and employs the following steps:

- Determines which image is larger.
- Resizes the smaller image to match the larger image.
- Creates a merged document twice as high as either image in order to hold both images.
- Selects part of the document to and pastes the eagle into the selection. T
- Inverts the selection and pastes the duckinto the lower part of the document.
- Positions the eagle over the duck.

Document.jsx

```
// Save the current preferences
var startRulerUnits = app.preferences.rulerUnits
var startTypeUnits = app.preferences.typeUnits
var startDisplayDialogs = app.displayDialogs

// Set Adobe Photoshop CS2 to use pixels and display no dialogs
app.preferences.rulerUnits = Units.PIXELS
app.preferences.typeUnits = TypeUnits.PIXELS
app.displayDialogs = DialogModes.NO

// first close all the open documents
while (app.documents.length) {
   app.activeDocument.close()
}

// Open the eagle and duck files from the samples folder
var eagleDoc = open(File(app.path + "/Samples/Eagle.psd"))
var duckDoc = open(File(app.path + "/Samples/Ducky.tif"))

// Find out which document is larger
// Resize the smaller document the to the larger document's size
// The resize requires the document be the active/front document
if ((eagleDoc.width.value * eagleDoc.height.value) > (duckDoc.width.value *
duckDoc.height.value)) {
   app.activeDocument = duckDoc
   duckDoc.resize(eagleDoc.width, eagleDoc.height)
} else {
   app.activeDocument = eagleDoc
   eagleDoc.resizeImage(duckDoc.width, duckDoc.height)
}

// Create a new document twice as high as two files
var mergedDoc = app.documents.add(duckDoc.width, duckDoc.height * 2,
duckDoc.resolution, "EagleOverDuck")

// Copy the eagle to the top; make it the active document so we can manipulate it
app.activeDocument = eagleDoc
eagleDoc.activeLayer.copy()

//Pastethe eagle to the merged document, making the merged document active
app.activeDocument = mergedDoc

// Select a square area at the top of the new document
var selRegion = Array(Array(0, 0),
                  Array(mergedDoc.width.value, 0),
                  Array(mergedDoc.width.value, mergedDoc.height.value / 2),
                  Array(0, mergedDoc.height.value / 2),
                  Array(0, 0))
// Create the selection
mergedDoc.selection.select(selRegion)

//Paste in the eagle
mergedDoc.paste()

// do the same thing for the duck
app.activeDocument = duckDoc
duckDoc.activeLayer.copy()
```

```
app.activeDocument = mergedDoc
mergedDoc.selection.select(selRegion)

// Inverting the selection so the bottom of the document is now selected
mergedDoc.selection.invert()

// Paste the duck
mergedDoc.paste()

// get rid of our originals without modifying them
duckDoc.close(SaveOptions.DONOTSAVECHANGES)
eagleDoc.close(SaveOptions.DONOTSAVECHANGES)

// Reset the application preferences
app.preferences.rulerUnits = startRulerUnits
app.preferences.typeUnits = startTypeUnits
app.displayDialogs = startDisplayDialogs
```

DocumentInfo

Metadata about a `document` object. These values can be set by selecting File > File Info in the Adobe Photoshop CS2 application.

Note: You use the object name `info`, rather than the class name `DocumentInfo`, in a script, as in the following sample, which sets the `author`, `caption`, and `copyrighted` properties:

```
var docRef = open(fileList[i])
// set the file info
docRef.info.author = "Mr. Adobe programmer"
docRef.info.caption = "Adobe Photo shoot"
docRef.info.copyrighted = CopyrightedType.COPYRIGHTEDWORK
```

The following sample uses the `DocumentInfo` object incorrectly:

```
docRef.DocumentInfo.author = "Mr. Adobe programmer"
docRef.DocumentInfo.caption = "Adobe Photo shoot"
docRef.DocumentInfo.copyrighted = CopyrightedType.COPYRIGHTEDWORK
```

Properties

Property	Value Type	What it is
author	`string`	Read-write.
authorPosition	`string`	Read-write.
caption	`string`	Read-write.
captionWriter	`string`	Read-write.
category	`string`	Read-write.
city	`string`	Read-write.
copyrighted	`CopyrightedType`	Read-write. The copyrighted status.
copyrightNotice	`string`	Read-write.
country	`string`	Read-write.
creationDate	`string`	Read-write.
credit	`string`	Read-write.
exif	`Array of arrays: Array(Array (tag, tag data)), ...)`	Read-only. Camera data that includes camera settings used when the image was taken. Sample array values are: tag = “camera”; tag value = “Cannon”.
headline	`string`	Read-write.
instructions	`string`	Read-write.
jobName	`string`	Read-write.
keywords	`Array (strings)`	Read-write. A list of keywords that can identify the document or its contents.
ownerUrl	`string`	Read-write.

Property	Value Type	What it is (Continued)
parent	object (Document)	Read-only. The info object's container.
provinceState	string	Read-write.
source	string	Read-write.
supplementalCategories	Array (strings)	Read-write.
title	string	Read-write.
transmissionReference	string	Read-write.
typename	string	Read-only. The class name of the referenced info object.
urgency	Urgency	Read-write.

Sample Script

The following script sets document info (metadata) for all of the files in a specified folder and then saves the modified files as low-quality JPEG images in a new folder without changing the originals.

- Ask the user to specify the folder that contains the original files and the output folder for the JPEG images, and then check that the folders exist.
- Open each file and use the documentInfo object properties to tag it with the following metadata:
  - author: Mr. Adobe programmer
  - caption: Adobe Photo shoot
  - captionWriter: Mr. Adobe programmer
  - city: San Jose
  - copyrightNotice: Copyright (c) Adobe programmer Photography
  - copyrighted status: Copyrighted Work
  - country: USA
  - state: CA
- Save the new documents in JPEG format with a low quality setting.

DocumentInfo.jsx

```
// Save the current preferences
var startDisplayDialogs = app.displayDialogs

// Set Adobe Photoshop CS2 to use pixels and display no dialogs
app.displayDialogs = DialogModes.NO

// ask the user for the input folder
var inputFolder = Folder.selectDialog("Select a folder to tag")

// ask the user for the output folder
var outputFolder = Folder.selectDialog("Select a folder for the output files")

// see if we got something interesting from the dialog
if (inputFolder != null && outputFolder != null) {
```

```
// get all the files found in this folder
var fileList = inputFolder.getFiles()

// save the outputs in JPEG
var jpegOptions = new JPEGSaveOptions()

// set the jpeg quality really low so the files are small
jpegOptions.quality = 1

// open each one in turn
for (var i = 0; i < fileList.length; i++) {

      // The fileList includes both folders and files so open only files
      if (fileList[i] instanceof File && fileList[i].hidden == false) {

         // get a reference to the new document
         var docRef = open(fileList[i])

         // tag all of the documents with photo shoot information
         docRef.info.author = "Mr. Adobe programmer"
         docRef.info.caption = "Adobe Photo shoot"
         docRef.info.captionWriter = "Mr. Adobe programmer"
         docRef.info.city = "San Jose"
         docRef.info.copyrightNotice = "Copyright (c) Adobe programmer
            Photography"
         docRef.info.copyrighted = CopyrightedType.COPYRIGHTEDWORK
         docRef.info.country = "USA"
         docRef.info.provinceState = "CA"

         // change the date to a Adobe Photoshop CS2 date format
         // "YYYYMMDD"
         var theDate = new Date()

         // the year is from 1900 ????
         var theYear = (theDate.getYear() + 1900).toString()

         // convert the month from 0..12 to 00..12
         var theMonth = theDate.getMonth().toString()

         if (theDate.getMonth() < 10) {
            theMonth = "0" + theMonth
      }

         // convert the day from 0..31 to 00.31
         var theDay = theDate.getDate().toString()

         if (theDate.getDate() < 10) {
            theDay = "0" + theDay
      }

         // stick them all together
         docRef.info.creationDate = theYear + theMonth + theDay

         // flatten because we are saving to JPEG
         docRef.flatten()

         // go to 8 bit because we are saving to JPEG
         docRef.bitsPerChannel = BitsPerChannelType.EIGHT
```

```
                // save and close
                docRef.saveAs(new File(outputFolder + "/Output" + i + ".jpg"),
                    jpegOptions)

                // don't modify the original
                docRef.close(SaveOptions.DONOTSAVECHANGES)
            }
        }
    }

    // Reset the application preferences
    app.displayDialogs = startDisplayDialogs
```

Documents

The collection of open `document` objects. See `Document` for information on the `document` object.

Note: Because the `Documents` class is a property of the Application object, you use the object name, `documents`, rather than the class name, `Documents`, in your code, as in the following example:

```
documents.add(800, 500, 72, "myDocument", NewDocumentMode.RGB)
```

The following example, which uses an upper case *D* in the object name, is incorrect:

```
Documents.add(800, 500, 72, "myDocument", NewDocumentMode.RGB)
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the documents collection.
parent	object (Application)	Read-only. The documents objects' container.
typename	string	Read-only. The class name of the referenced documents object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	Document	Gets an element from the documents collection.
add ([width] [, height] [, resolution] [, name] [, mode] [, initialFill] [pixelAspectRatio])	UnitValue UnitValue number (double) string NewDocumentMode DocumentFill number (double)	Document	Adds a document object (pixelAspectRatio: 0.100 0 10.00).
getByName (name)	string	Document	Gets the first element in the documents collection with the provided name

EPSOpenOptions

Options that can be specified when opening an EPS format document.

Properties

Property	Value Type	What it is
antiAlias	boolean	Read-write. Indication of whether to use antialias.
constrainProportions	boolean	Read-write. Indication of whether to constrain the proportions of the image.
height	UnitValue	Read-write. The height of the image (unit value).
mode	OpenDocumentMode	Read-write. The color profile to use as the document mode.
resolution	number (double)	Read-write. The resolution of the document in pixels per inch.
typename	string	Read-only. The class name of the referenced EPSOpenOptions object.
width	UnitValue	Read-write. The width of the image (unit value).

EPSSaveOptions

Options that can be specified when saving a document in EPS format.

Properties

Property	Value Type	What it is
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in this document.
encoding	SaveEncoding	Read-write. The type of encoding to use (default: SaveEncoding.BINARY).
halftoneScreen	boolean	Read-write. Indication of whether to include the halftone screen (default: false).
interpolation	boolean	Read-write. Indication of whether to use image interpolation (default: false).
preview	Preview	Read-write. The preview type.
psColorManagement	boolean	Read-write. Indication of whether to use Postscript color management (default: false).
transferFunction	boolean	Read-write. Indication of whether to include the Transfer functions to compensate for dot gain between the image and film (default: false).
transparentWhites	boolean	Read-write. Indication of whether to display white areas as transparent. **Note:** Valid only when *document*.mode - DocumentMode.BITMAP. See 'mode' on page 88 (in the Properties table of the document object) or 'changeMode' on page 90 (in the Methods table of the document object).
typename	string	Read-only. The class name of the referenced EPSSaveOptions object.
vectorData	boolean	Read-write. Indication of whether to include vector data. **Note:** Valid only if the document includes vector data (text).

ExportOptionsIllustrator

Options that can be specified when exporting a PathItem object to an Adobe Illustrator® file.

Properties

Property	Value Type	What it is
path	IllustratorPathType	Read-write. The type of path to export (default: IllustratorPathType.DOCUMENTBOUNDS).
pathName	string	Read-write. The name of the path to export. **Note:** Valid only when path = IllustratorPathType.NAMEDPATH. See path.
typename	string	Read-only. The class name of the referenced exportOptionsIllustrator object.

ExportOptionsSaveForWeb

Options that can be specified when optimizing a document for the web.

Properties

Property	Value type	What it is
blur	number (double)	Read-write. Applies blur to the image to reduce artifacts (default: 0.0).
colorReduction	ColorReductionType	Read-write. The color reduction algorithm (default: ColorReductionType.SELECTIVE).
colors	number (long)	Read-write. The number of colors in the palette (default: 256).
dither	Dither	Read-write. The type of dither (default: Dither.DIFFUSION).
ditherAmount	number (long)	Read-write. The amount of dither (default: 100). **Note:** Valid only when dither = Dither.DIFFUSION. See dither.
format	SaveDocumentType	Read-write. The file format to use (default: SaveDocumentType.COMPUSERVEGIF). **Note:** For this property, only COMPUSERVEGIF, JPEG, PNG-8, PNG-24, and BMP are supported.
includeProfile	boolean	Read-write. Indication of whether to include the document's embedded color profile (default: false).
interlaced	boolean	Read-write. Indication of whether to download in multiple passes; progressive (default: false).
lossy	number (long)	Read-write. The amount of lossiness allowed (default: 0).
matteColor	RGBColor	Read-write. The colors to blend transparent pixels against.
optimized	boolean	Read-write. Indication of whether to create smaller but less compatible files (default: true). **Note:** Valid only when format = SaveDocumentType.JPEG. See format.

Property	Value type	What it is (Continued)
PNG8	boolean	Read-write. Indicates the number of bits; true = 8, false = 24 (default: true). **Note:** Valid only when format = SaveDocumentType.PNG. See format.
quality	number (long)	Read-write. The quality of the produced image (0 - 100 as percentage; default: 60).
transparency	boolean	Read-write. Indication of transparent areas of the image should be included in the saved image(default: true).
transparencyAmount	number (long)	Read-write. The amont of transparency dither (default: 100). **Note:** Valid only if transparency = true. See transparency.
transparencyDither	Dither	Read-write. The transparency dither algorithm (default: transparencyDither = Dither.NONE).
typename	string	Read-only. The class name of the referenced ExportOptionsSaveForWeb object.
webSnap	number (long)	Read-write. The tolerance amount within which to snap close colors to web palette colors (default: 0).

GalleryBannerOptions

Options that define the `bannerOptions` property of the `galleryOptions` object. See 'GalleryOptions' on page 109.

Tip: You can preserve default values for many `galleryBannerOptions` properties by setting the `galleryOptions` property `preserveAllMetadata` to `true` or by choosing **File > Automate > Web Photo Gallery**, and then choosing **Preserve all metadata on the Options area of the Web Photo Gallery dialo**g.

Properties

Property	Value Type	What it is
contactInfo	`string`	Read-write. The web photo gallery contact info.
date	`string`	Read-write. The web photo gallery date (default: current date).
font	`GalleryFontType`	Read-write. The font setting for the banner text (default: `GalleryFontType.ARIAL`).
fontSize	`number (long)`	Read-write. The font size for the banner text (1 - 7; default: `3`).
photographer	`string`	Read-write. The web photo gallery photographer.
siteName	`string`	Read-write. The web photo gallery site name (default: `Adobe Web Photo Gallery`).
typename	`string`	Read-only. The class name of the referenced `galleryBannerOptions` object.

GalleryCustomColorOptions

Options that define the `customColorOptions` property of the `galleryOptions` object. See 'GalleryOptions' on page 109.

Tip: You can preserve default values for many `galleryCustomColorOptions` properties by setting the `galleryOptions` property `preserveAllMetadata` to `true` or by choosing **File > Automate > Web Photo Gallery**, and then choosing **Preserve all metadata on the Options area of the Web Photo Gallery dial**og.

Properties

Property	Value Type	What it is
activeLinkColor	RGBColor	Read-write. The color to use to indicate an active link.
backgroundColor	RGBColor	Read-write. The background color.
bannerColor	RGBColor	Read-write. The banner color.
linkColor	RGBColor	Read-write. The color to use to indicate a link.
textColor	RGBColor	Read-write. The text color.
typename	string	Read-only. The class name of the referenced `galleryCustomColorOptions` object.
visitedLinkColor	RGBColor	Read-write. The color to use to indicate a visited link.

GalleryImagesOptions

Options that define the `imagesOptions` property of the `galleryOptions` object. See 'GalleryOptions' on page 109.

Tip: You can preserve default values for many `galleryImagesOptions` properties by setting the `galleryOptions` property `preserveAllMetadata` to `true` or by choosing **File > Automate > Web Photo Gallery**, and then choosing **Preserve all metadata on the Options area of the Web Photo Gallery dialo**g.

Properties

Property	Value Type	What it is
border	`number (long)`	Read-write. The size (in pixels) of the border that separates images (0 - 99; default: `0`).
caption	`boolean`	Read-write. Indication of whether to generate image captions (default: `false`).
dimension	`number (long)`	Read-write. The resized image dimensions in pixels (default: `350`). **Note:** Valid only when `resizeImages = true`. See resizeImages.
font	GalleryFontType	Read-write. The font to use for image captions (default: `GalleryFontType.ARIAL`).
fontSize	`number (long)`	Read-write. The font size for image captions (1 - 7; default: `3`). **Note:** Valid only when `caption = true`. See caption.
imageQuality	`number (long)`	Read-write. The quality setting for a JPEG image (0 - 12; default: `5`).
includeCopyright	`boolean`	Read-write. Indication of whether to include copyright information in captions (default: `false`). **Note:** Valid only when `caption = true`. See caption.
includeCredits	`boolean`	Read-write. Indication of whether to include the credits in image captions (default: `false`). **Note:** Valid only when `caption = true`. See caption.

Property	Value Type	What it is (Continued)
includeFilename	boolean	Read-write. Indication of whether to include the file name in image captions (default: true). **Note:** Valid only when caption = true. See caption.
includeTitle	boolean	Read-write. Indication of whether to include the title in image captions (default: false). **Note:** Valid only when caption = true. See caption.
numericLinks	boolean	Read-write. Indication of whether to add numeric links (default: true).
resizeConstraint	GalleryConstrainType	Read-write. The image dimensions to constrain in the gallery image (default: GalleryConstrainType.CONSTRAINBOTH). **Note:** Valid only when resizeImages = true. See resizeImages.
resizeImages	boolean	Read-write. Indication of whether to automatically resize images for placement on the gallery pages (default: true).
typename	string	Read-only. The class name of the referenced galleryImagesOptions object.

GalleryOptions

Options that can be specified for a Web photo gallery.

Tip: You can preserve default values for many `galleryOptions` properties by choosing **File > Automate > Web Photo Gallery**, and then choosing **Preserve all metadata on the Options area of the Web Photo Gallery dialog.**

Properties

Property	Value Type	What it is
addSizeAttributes	`boolean`	Read-write. Indicates whether width and height attributes for images will be added (default: `true`).
bannerOptions	`GalleryBannerOptions`	Read-write. The options related to banner settings.
customColorOptions	`GalleryCustomColorOptions`	Read-write. The options related to custom color settings.
emailAddress	`string`	Read-write. The email address to show on the web page.
imagesOptions	`GalleryImagesOptions`	Read-write. The options related to images settings.
includeSubFolders	`boolean`	Read-write. Indication of whether to include all files found in sub folders of the input folder (default: `true`).
layoutStyle	`string`	Read-write. The style to use for laying out the web page (default: `Centered Frame 1 - Basic`).
preserveAllMetadata	`boolean`	Read-write. Indicates whether to save metadata (default: `false`).
securityOptions	`GallerySecurityOptions`	Read-write. The options related to security settings.
thumbnailOptions	`GalleryThumbnailOptions`	Read-write. The options related to thumbnail image settings.
typename	`string`	Read-only. The class name of the referenced `galleryOptions` object.
useShortExtension	`boolean`	Read-write. Indicates whether the short web page extension `.htm` or number (long) web page extension `.html` will be used (default: `true`).
useUTF8Encoding	`boolean`	Read-write. Indicates whether the web page should use UTF-8 encoding (default: `false`).

GallerySecurityOptions

Options that define the `securityOptions` property of the `galleryOptions` object. See 'GalleryOptions' on page 109.

Tip: You can preserve default values for many `gallerySecurityOptions` properties by setting the `galleryOptions` property `preserveAllMetadata` to `true` or by choosing **File > Automate > Web Photo Gallery**, and then choosing **Preserve all metadata on the Options area of the Web Photo Gallery dia**log.

Properties

Property	Value Type	What it is
content	GallerySecurityType	Read-write. The web photo gallery security content (default: `GallerySecurityType.NONE`).
font	GalleryFontType	Read-write. The web photo gallery security font (default: `GalleryFontType.ARIAL`).
fontSize	`number (long)`	Read-write. The web photo gallery security font size (1 - 72; default: `3`).
opacity	`number (long)`	Read-write. The web page security opacity as a percent (default: `100`).
text	`string`	Read-write. The web photo gallery security custom text.
textColor	RGBColor	Read-write. The web page security text color.
textPosition	GallerySecurityTextPositionType	Read-write. The web photo gallery security text position (default: `GallerySecurityTextPositionType.CENTERED`).
textRotate	GallerySecurityTextRotateType	Read-write. The web photo gallery security text orientation to use (default: `GallerySecurityTextRotateType.ZERO`).
typename	`string`	Read-only. The class name of the referenced `gallerySecurityOptions` object.

GalleryThumbnailOptions

Options that define the `thumbnailOptions` property of the `galleryOptions` object. See 'GalleryOptions' on page 109.

Tip: You can preserve default values for many `galleryThumbnailOptions` properties by setting the `galleryOptions` property `preserveAllMetadata` to `true` or by choosing **File > Automate > Web Photo Gallery**, and then choosing **Preserve all metadata on the Options area of the Web Photo Gallery dialo**g.

Properties

Property	Value Type	What it is
border	`number (long)`	Read-write. The amount of border pixels you want around your thumbnail images (0 - 99; default: `0`).
caption	`boolean`	Read-write. Indicates whether there is a caption (default: `false`).
columnCount	`number (long)`	Read-write. The number of columns on the page (default: `5`).
dimension	`number (long)`	Read-write. The web photo gallery thumbnail dimension in pixels (default: `75)`.
font	`GalleryFontType`	Read-write. The web photo gallery font (default: `GalleryFontType.ARIAL`).
fontSize	`number (long)`	Read-write. The font size for thumbnail images text (1 - 7; default: `3`).
includeCopyright	`boolean`	Read-write. Indication of whether to include copyright information for thumbnails (default: `false`).
includeCredits	`boolean`	Read-write. Indication of whether to include credits for thumbnails (default: `false`).
includeFilename	`boolean`	Read-write. Indication of whether to include file names for thumbnails (default: `false`).
includeTitle	`boolean`	Read-write. Indication of whether to include titles for thumbnails (default: `false`).
rowCount	`number (long)`	Read-write. The number of rows on the page (default: `3`).
size	`GalleryThumbSizeType`	Read-write. The thumbnail image size (default: `GalleryThumbSizeType.MEDIUM`).
typename	`string`	Read-only. The class name of the referenced `GalleryThumbnailOptions` object.

GIFSaveOptions

Options that can be specified when saving a document in GIF format.

Properties

Property	Value Type	What it is
colors	number (long)	Read-write. The number of palette colors. **Note:** Valid only when `palette = Palette.LOCALADAPTIVE`; `palette = Palette.LOCALPERCEPTUAL`; `palette = Palette.LOCALSELECTIVE`; `palette = Palette.MACOSPALETTE`; `palette = Palette.UNIFORM`; `palette = Palette.WEBPALETTE`; or `palette = Palette.WINDOWSPALETTE`. See palette.
dither	Dither	Read-write. The dither type.
ditherAmount	number (long)	Read-write. The amount of dither. (1 - 100; default: `75`). **Note:** Valid only for when `dither = Dither.DIFFUSION`. See dither.
forced	ForcedColors	Read-write. The type of colors to force into the color palette.
interlaced	boolean	Read-write. Indicates whether rows should be interlaced (default: `false`).
matte	MatteType	Read-write. The color to use to fill anti-aliased edges adjacent to transparent areas of the image (default: `MatteType.WHITE`). **Note:** When `transparency = false`, the matte color is applied to transparent areas. See transparency.
palette	Palette	Read-write. The type of palette to use (default: `Palette.LOCALSELECTIVE`).
preserveExactColors	boolean	Read-write. Indication of whether to protect colors in the image that contain entries in the color table from being dithered. **Note:** Valid only when `dither = Dither.DIFFUSION`. See dither.

Property	Value Type	What it is (Continued)
transparency	boolean	Read-write. Indication of whether to preserve transparent areas of the image during conversion to GIF format.
typename	string	Read-only. The class name of the referenced GIFSaveOptions object.

GrayColor

Options for defining a gray color.

Properties

Property	Value Type	What it is
gray	number (double)	Read-write. The gray value (0.0 - 100.0; default: 0.0).
typename	string	Read-only. The class name of the referenced grayColor object.

HistoryState

A version of the document stored automatically (and added to the `HistoryStates` collection), which preserves the document's state, each time the document is changed. See HistoryStates for information about the `HistoryStates` collection.

Note: Because the `HistoryState` class is also a property of the Document object, you use the object name, `historyState`, rather than the class name, `HistoryState`, in your code.

The following example uses correct syntax to refer to a `HistoryState` object named `AddLayerMask` and then assign its `snapshot` property value:

```
documents(0).historyState("AddLayerMask").snapshot = true
```

The following example, which uses an upper case *A* in the object name, is incorrect:

```
documents(0).HistoryState("AddLayerMask").snapshot = true
```

Properties

Property	Value Type	What it is
name	`string`	Read-only. The `HistoryState` object's name.
parent	`object (Document)`	Read-only. The `HistoryState` object's container.
snapshot	`boolean`	Read-only. Indicates whether the history state is a snapshot.
typename	`string`	Read-only. The class name of the referenced `HistoryState` object.

HistoryStates

The collection of `HistoryState` objects in the document. See HistoryState for more information on `HistoryState` objects.

Note: Because the `HistoryStates` class is also a property of the Document object, you use the object name, `historyStates`, rather than the class name, `HistoryStates`, in your code.

The following example uses correct syntax to fill a Selection object (referred to by the variable selRef) with an object in the `HistoryStates` collection:

```
selRef.fill(activeDocument.historyStates[7])
```

The following example, which uses an upper case *H* in the object name, is incorrect:

```
selRef.fill(activeDocument.HistoryStates[7])
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `HistoryStates` collection.
parent	object (Document)	Read-only. The `HistoryStates` object's container.
typename	string	Read-only. The class name of the referenced `HistoryStates` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	HistoryState	Gets an element from the `HistoryStates` collection.
getByName (name)	string	HistoryState	Get the first element in the `HistoryStates` collection with the provided name.

HSBColor

Options that can be specified for a color object using the HSB color model.

Properties

Property	Value Type	What it is
brightness	number (double)	Read-write. The brightness value (between 0.0 and 100.0).
hue	number (double)	Read-write. The hue value (between 0.0 and 360.0).
saturation	number (double)	Read-write. The saturation value (between 0.0 and 100.0).
typename	string	Read-only. The class name of the referenced HSBColor object.

IndexedConversionOptions

Options that can be specified when converting an RGB image to an indexed color model.

Properties

Property	Value Type	What it is
colors	number (long)	Read-write. The number of palette colors. **Note:** Valid only when `palette = Palette.LOCALADAPTIVE; palette = Palette.LOCALPERCEPTUAL; palette = Palette.LOCALSELECTIVE; palette = Palette.MACOSPALETTE; palette = Palette.UNIFORM; palette = Palette.WEBPALETTE; or palette = Palette.WINDOWSPALETTE .` See palette.
dither	Dither	Read-write. The dither type.
ditherAmount	number (long)	Read-write. The amount of dither. (1 - 100). **Note:** Valid only when `dither = Dither.diffusion`.
forced	ForcedColors	Read-write. The type of colors to force into the color palette.
matte	MatteType	Read-write. Read-write. The color to use to fill anti-aliased edges adjacent to transparent areas of the image (default: `MatteType.WHITE`). **Note:** When `transparency = false`, the matte color is applied to transparent areas. See transparency.
palette	Palette	Read-write. The palette type (default: `Palette.EXACT`).
preserveExactColors	boolean	Read-write.Indication of whether to protect colors in the image that contain entries in the color table from being dithered. **Note:** Valid only when `dither = Dither.DIFFUSION`. See dither.
transparency	boolean	Read-write. Indication of whether to preserve transparent areas of the image during conversion to GIF format.
typename	string	Read-only. The class name of the referenced `IndexedConversionOptions` object.

JPEGSaveOptions

Options that can be specified when saving a document in JPEG format.

Properties

Property	Value Type	What it is
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in the document.
formatOptions	FormatOptions	Read-write.The download format to use (default: FormatOptions.STANDARDBASELINE).
matte	MatteType	Read-write. The color to use to fill anti-aliased edges adjacent to transparent areas of the image (default: MatteType.WHITE). **Note:** When transparency = false, the matte color is applied to transparent areas. See transparency.
quality	number (long)	Read-write. The image quality setting to use (affects file size and compression) (0 - 12; default: 3).
scans	number (long)	Read-write. The number of scans to make to incrementally display the image on the page (3 - 5; default: 3). **Note:** Valid only for when formatOptions = FormatOptions.PROGRESSIVE.
typename	string	Read-only. The class name of the referenced JPEGSaveOptions object.

LabColor

Options that can be specified when defining a color object using the LAB color model.

Properties

Property	Value Type	What it is
a	number (double)	Read-write. The a-value (-128.0 - 127.0).
b	number (double)	Read-write. The b-value (-128.0 - 127.0).
l	number (double)	Read-write. The L-value (0.0 - 100.0).
typename	string	Read-only. The class name of the referenced LabColor object.

LayerComp

A snapshot of a state of the layers in a document (can be used to view different page layouts or compostions).

Note: Because the `LayerComp` class is also a property of the Document object, you use the object name, `layerComp`, rather than the class name, `LayerComp`, in your code.

The following example uses correct syntax to set the comment property value for a `LayerComp` object named `myLayerComp`:

```
activeDocument.layerComp("myLayerComp").comment = "View from shoreline"
```

The following example, which uses an upper case *L* in the object name, is incorrect:

```
activeDocument.LayerComp("myLayerComp").comment = "View from shoreline"
```

Properties

Property	Value Type	What it is
appearance	boolean	Read-write. Indication of whether to use layer appearance (layer styles) settings.
comment	string	Read-write. A description of the layer comp.
name	string	Read-write. The name of the layer comp.
parent	object (Document)	Read-write. The `layerComp` object's container.
position	boolean	Read-write. Indication of whether to use layer position.
selected	boolean	Read-only. Indication of whether the layer comp is currently selected.
typename	string	Read-only. The class name of the referenced `layerComp` object.
visibility	boolean	Read-write. Indication of whether to use layer visibility settings .

Methods

Method	Parameter Type	Returns	What it does
apply ()			Applies the layer comp to the document.
recapture ()			Recaptures the current layer state(s) for this layer comp.

Method	Parameter Type	Returns	What it does (Continued)
remove ()			Deletes the `layerComp` object.
resetfromComp ()			Resets the layer comp state to the document state.

LayerComps

The collection of `layerComp` objects in the document. See LayerComp for information on `layerComp` objects.

Note: Because the `LayerComps` class is also a property of the Document object, you use the object name, `layerComps`, rather than the class name, `LayerComps`, in your code.

The following example uses correct syntax to add a `LayerComps`:

```
activeDocument.layerComps.add("myLayerComp", "View from Shoreline", true, true,
true)
```

The following example, which uses an upper case *L* in the object name, is incorrect:

```
activeDocument.LayerComps.add("myLayerComp", "View from Shoreline", true, true,
true)
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `layerComps` collection.
parent	object (Document)	Read-only. The `layerComps` object's container.
typename	string	Read-only. The class name of the referenced `layerComps` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	LayerComp	Gets an element from the `layerComps` collection.
add (name, comment, appearance, position, visibility)	string string boolean boolean boolean	LayerComp	Adds a layer comp.
getByName (name)	string	LayerComp	Gets the first element in the collection with the provided name.
removeAll ()			Removes all `layerComp` objects from the `layerComps` collection.

Layers

The collection of layer objects, including `artLayer` and `layerSet` objects, in the document. See ArtLayer for information on `artLayer` objects. See LayerSet for information on `layerSet` objects.

Note: Because the `Layers` object is a property of the Document object (as well as several other objects), you use the object name, `layers`, rather than the class name, `Layers`, in your code. The following example uses the `length` property to count the number of `layer` objects in the active document, then displays the number on the screen:

```
var layerNum = app.activeDocument.layers.length
alert(layerNum)
```

The following example uses an upper case *L*, which is incorrect:

```
var layerNum = app.activeDocument.Layers.length
alert(layerNum)
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `layers` collection.
parent	object (document or layerSet)	Read-only. The `layers` object's container.
typename	string	Read-only. The class name of the referenced `layers` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	object(Layer)	Gets an element from the collection.
getByName (name)	string	Layer	Gets the first element in the `layers` collection with the provided name.
removeAll ()			Removes all layers from the collection.

LayerSet

A group of layer objects, which can include `artLayer` objects and other (nested) `layerSet` objects. A single command or set of commands manipulates all layers in a `layerSet` object.

Note: Most likely, you will use variables to refer to `layerSet` objects in your script. However, if you choose not to use a variable, be aware that, because the `LayerSet` class is also a property of the Document object, you use the object name, `layerSet`, rather than the class name, `LayerSet`, in your code.

The following example uses correct syntax to refer to a `layerSet` object by name and then assign its `allLocked` property value:

```
documents(0).layerSet("myLayerSet").allLocked = true
```

The following example, which uses an upper case *L* in the object name, is incorrect:

```
documents(0).LayerSet("myLayerSet").allLocked = true
```

Properties

Property	Value Type	What it is
allLocked	boolean	Read-write. Indicates whether the contents in the layers contained in the `layerSet` object are editable.
artLayers	ArtLayer	Read-only. The `artLayer` objects in this layer set.
blendMode	BlendMode	Read-write. The blend mode to use for the layer set.
bounds	Array(UnitValue)	Read-only. The bounding rectangle of the layer set.
enabledChannels	Array (Channel objects)	Read-write. The channels enabled for the layer set; must be a list of component channels. **Note:** See `kind` in the Properties table for the Channel object (`Channel`).
layers	LayerSets	Read-only. The layers in this `layerSet` object.
layerSets	LayerSets	Read-only. Layer Sets contained within a Layer Set.
linkedLayers	Array (layers)	Read-only. The layers linked to this `layerSet` object.
name	string	Read-write. The name of the `layerSet` object.
opacity	number (double)	Read-write. The master opacity of the `layerSet` object (0.0 - 100.0).
parent	object (document or layerSet)	Read-only. The `layerSet` object's container.
typename	string	Read-only. The class name of the referenced `layerSet` object.
visible	boolean	Read-write. Indicates whether the `layerSet` object is visible.

Methods

Method	Parameter Type	Returns	What it does
duplicate ([relativeObject] [, insertionLocation])	object (ArtLayer or LayerSet) ElementPlacement	object (Layer)	Creates a duplicate of the layerSet object.
link (with)	object (Layer)		Links the layer set with another layer.
merge ()		ArtLayer	Merges the layerset; returns a reference to the art layer created by this method.
move (relativeObject, insertionLocation)	object (layer or layerSet) ElementPlacement		Moves the layerSet object.
remove ()			Deletes the layerSet object.
resize ([horizontal] [, vertical] [, anchor])	number (double) number (double) AnchorPosition		Resizes all layers in the layer set to to the specified dimensions (as a percentage of its current size) and places the layer set in the specified position.
rotate (angle [, anchor])	number (double) AnchorPosition		Rotates all layers in the layer set around the specified anchor point (default: AnchorPosition.MIDDLECENTER) .
translate ([deltaX] [, deltaY])	UnitValue UnitValue		Moves the position relative to its current position.
unlink ()			Unlinks the layer set.

LayerSets

The collection of `layerSet` objects in the document. See LayerSet for information on `layerSet` objects.

Note: Because the `LayerSets` class is a property of the Document object, you use the object name, `layerSets`, rather than the class name, `LayerSets`, in your code. For example:

```
var laysetRef = docRef.layerSets.add()
```

The following sample uses the `layerSets` object incorrectly:

```
var laysetRef = docRef.LayerSets.add()
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `layerSets` collection.
parent	object (document or layerSet)	Read-only. The `layerSets` object's container.
typename	string	Read-only. The class name of the referenced `layerSets` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	LayerSet	Gets an element from the `layerSets` collection.
add ()		LayerSet	Creates a new `layerSet` object.
getByName (name)	string	LayerSet	Gets the first element in the `layerSets` collection with the provided name.
removeAll ()			Removes the layer set, and any layers or layer sets it contains, from the document.

Sample Script

The following script creates three layer sets, then nests a second layer set in each layer set, and then creates a text layer in each nested set that that displays the text "Layer in *n* Set Inside *n* Set", where *n* represents the ordinal number of the set (first, second, or third).

Note: The script uses the `$` object, which is defined in 'Dollar ($) Object' on page 293.

LayerSets.jsx

```
$.level = 1

//close all open documents
while (app.documents.length) {
   app.activeDocument.close()
```

```
}

// create a working document
var docRef = app.documents.add()

// create an array to hold the layer sets
var myLayerSets = new Array()

// Create an array to hold the text
var textArray = Array("First", "Second", "Third")

//Create an indexer variable
var i = 0

// Create three layer sets at the top level
for (i = 0; i < 3; i++) {
   myLayerSets[i] = new Array()
   myLayerSets[i][0] = docRef.layerSets.add()
}

// Rearrange the layer sets with the first one on top, second next, etc.
myLayerSets[1][0].moveAfter(myLayerSets[0][0])
myLayerSets[2][0].moveAfter(myLayerSets[1][0])

// Create a layer set inside each layer set
for (i = 0; i < 3; i++) {
   myLayerSets[i][0].name = textArray[i] + " Set"
   myLayerSets[i][1] = myLayerSets[i][0].layerSets.add()
   myLayerSets[i][1].name = "Inside " + textArray[i] + " Set"
}

// Create an array to hold the layers
var myLayers = new Array()

// Create a text layer with a description inside each layer set
for (i = 0; i < 3; i++) {
   myLayers[i] = myLayerSets[i][1].artLayers.add()
   myLayers[i].kind = LayerKind.TEXT
   myLayers[i].textItem.contents = "Layer in " + textArray[i] + " Set Inside "
          + textArray[i] + " Set"
   myLayers[i].textItem.position = Array(app.activeDocument.width * i * 0.33,
          app.activeDocument.height * (i + 1) * 0.25)
   myLayers[i].textItem.size = 12
}
```

LensBlurOptions

Defines the optional parameter of the `artLayer` object's `applyLensBlur()` method.

Note: See 'applyLensBlur' on page 60 (in the Methods table of the `artLayer` object).

Properties

Property	Value type	What it is
amount	number (long)	Read-write. The amount of noise (default: 0).
bladeCurvature	number (long)	Read-write. The blade curvature of the iris (default: 0).
brightness	number (long)	Read-write. The brightness for the specular highlights (default: 0).
distribution	NoiseDistribution	Read-write. The distribution value for the noise (default: NoiseDistribution.UNIFORM).
focalDistance	number (long)	Read-write. The blur focal distance for the depth map (default: 0).
invertDepthMap	boolean	Read-write. Indicates whether the depth map is inverted (default: false).
monochromatic	boolean	Read-write. Indicates whether the noise is monochromatic (default: false).
radius	number (long)	Read-write. The radius of the iris (default: 15).
rotation	number (long)	Read-write. The rotation of the iris (default: 0).
shape	Geometry	The shape of the iris (default: Geometry.HEXAGON).
source	DepthMapSource	Read-write. The source for the depth map (default: DepthMapSource.NONE).
threshold	number (long)	Read-write. The threshold for the specular highlights (default: 0).
typename	string	Read-only. The class name of the referenced lensBlurOptions object.

NoColor

An object that represents a missing color.

Properties

Property	Value type	What it is
typename	string	Read-only. The class name of the referenced noColor object.

Notifier

An event-handler object that tells the script to execute specified code when a specified event occurs.

Note: Because the `Notifier` class is also a property of the Document object, you use the object name, `notifier`, rather than the class name, `Notifier`, in your code.

Properties

Property	Value type	What it is
event	`string`	Read-only. The event ID in four characters or a unique string that the notifier is associated with.
eventClass	`string`	Read-only. The class ID of the event associated with the `Notifier` object, four characters or a unique string. **Note:** For a list of four-character codes, see Appendix A: Event ID Codes.
eventFile	`file`	Read-only. The path to the file to execute when the event occurs/activates the notifier.
parent	`object` (`Application`)	Read-only. The `notifier` object's container.
typename	`string`	Read-only. The class name of the referenced `notifier` object.

Methods

Method	Parameter type	Returns	What it does
remove ()			Deletes the `notifier` object. **Note:** You can remove a `notifier` object from the Script Events Manager drop-down list by deleting the file named `Script Events Manager.xml` from in the Photoshop preferences folder. See Adobe Photoshop CS2 help for more information.

Notifiers

The collection of `notifier` objects in the document; the `notifiers` property of the `app` object. See 'Notifier' on page 131 for information on `notifier` objects. See notifiers (in the Properties table of the `app` object).

Note: Because the `Notifiers` class is a property of the Document object, you use the object name, `notifiers`, rather than the class name, `Notifiers`, in your code. For example:

```
var notRef = activeDocument.notifiers.add("OnClickGoButton", app.path +
"/Presets/Scripts/Event Only Scripts/4322.jsx"")
```

The following sample uses the `Notifiers` object incorrectly:

```
var notRef = activeDocument.Notifiers.add("OnClickGoButton", app.path +
"/Presets/Scripts/Event Only Scripts/4322.jsx"")
```

Properties

Property	Value type	What it is
length	number (long)	Read-only. The number of elements in the `notifiers` collection.
parent	object (Application)	Read-only. The `notifiers` object's container
typename	string	Read-only. Read-only. The class name of the referenced `notifiers` object.

Methods

Method	Parameter type	Returns	What it does
index (itemKey)	number	Notifier	Gets an element from the `notifiers` collection.

Method	Parameter type	Returns	What it does (Continued)
add (event, eventFile [, eventClass])	string string file	Notifier	Creates a notifier object. **Note:** eventClass defines the class ID of the event: four characters or a unique string. For a list of four-character codes, see Appendix A: Event ID Codes. **Tip:** Remember to omit the single quotes when including a four-character ID in your code. **Note:** An eventClass value corresponds to the value you would type in the Descriptive Lable box when adding an event in the Script Events Manager in the Adobe Photoshop CS2 application. For more information on using the Script Events Manager, please refer to Adobe Photoshop CS2 help.
removeAll ()			Removes all notifier objects from the notifiers collection. **Note:** You can remove a notifier object from the Script Events Manager drop-down list by deleting the file named Script Events Manager.xml from in the Photoshop preferences folder. See Adobe Photoshop CS2 help for more information.

PathItem

A path or drawing object, such as the outline of a shape or a straight or curved line, which contains sub paths that comprise its geometry.

Note: Because the `PathItem` class is also a property of the Document object, you use the object name, `pathItem`, rather than the class name, `PathItem`, in your code.

The following example uses correct syntax to select a `pathItem` object :

```
activeDocuments.pathItem("myPath").select()
```

The following example, which uses an upper case *P* in the object name, is incorrect:

```
activeDocuments.PathItem("myPath").select()
```

Properties

Property	Value Type	What it is
kind	PathKind	Read-write. The `pathItem` object's type.
name	`string`	Read-write. The `pathItem` object's name.
parent	`object (document)`	Read-only. The `pathItem` object's container.
SubPathItems	SubPathItems	Read-only. The sub path objects for this `pathItem` object.
typename	`string`	Read-only. The class name of the referenced `pathItem` object.

Methods

Method	Parameter Type	Returns	What it does
deselect `()`			Deselects this `pathItem` object.
duplicate `(name)`	`string`		Duplicates this `pathItem` object with the new name specified in the argument.

fillPath `([fillColor] [, mode] [, opacity] [, preserveTransparency] [, feather] [, wholePath] [, antiAlias])`	`Object (SolidColor, ArtLayer, HistoryState)`
	ColorBlendMode
	`number (double)`
	`boolean`
	`number (double)`
	`boolean`
	`boolean`
			Fills the area enclosed by the path (`opacity`: 0 - 100 as percent; `feather`: 0.0 - 250.0 in pixels).

Method	Parameter Type	Returns	What it does (Continued)
makeClippingPath ([flatness])	number (double)		Makes this pathItem object the clipping path for this document; the optional parameter tells the PostScript printer how to approximate curves in the path (0.2 - 100).
makeSelection ([feather] [, antiAlias] [, operation])	number (double) boolean SelectionType		Makes a selection object, whose border is the path, from this pathItem object (feather: 0.0 - 250.0 in pixels). **Note:** See Selection.
remove ()			Deletes this pathItem object.
select ()			Makes this pathItem object the active or selected pathItem object.
strokePath ([tool] [, simulatePressure])	ToolType boolean		Strokes the path with the specified information.

Sample Script

The following creates a path in three segments: two diagonal lines that form a *V*, and a curved line above the *V* that makes it look like a 2D ice cream cone.

Paths.jsx

```
// Save the current preferences
var startRulerUnits = app.preferences.rulerUnits
var startTypeUnits = app.preferences.typeUnits
var startDisplayDialogs = app.displayDialogs

// Set Adobe Photoshop CS2 to use pixels and display no dialogs
app.preferences.rulerUnits = Units.PIXELS
app.preferences.typeUnits = TypeUnits.PIXELS
app.displayDialogs = DialogModes.NO

// first close all the open documents
while (app.documents.length) {
   app.activeDocument.close()
}

// create a document to work with
var docRef = app.documents.add(5000, 7000, 72, "Simple Line")

//line #1--it's a straight line so the coordinates for anchor, left, and //right
//for each point have the same coordinates
var lineArray = new Array()
   lineArray[0] = new PathPointInfo
   lineArray[0].kind = PointKind.CORNERPOINT
```

```
    lineArray[0].anchor = Array(100, 100)
    lineArray[0].leftDirection = lineArray[0].anchor
    lineArray[0].rightDirection = lineArray[0].anchor

    lineArray[1] = new PathPointInfo
    lineArray[1].kind = PointKind.CORNERPOINT
    lineArray[1].anchor = Array(150, 200)
    lineArray[1].leftDirection = lineArray[1].anchor
    lineArray[1].rightDirection = lineArray[1].anchor

var lineSubPathArray = new Array()
    lineSubPathArray[0] = new SubPathInfo()
    lineSubPathArray[0].operation = ShapeOperation.SHAPEXOR
    lineSubPathArray[0].closed = false
    lineSubPathArray[0].entireSubPath = lineArray

//line#2
var lineArray2[0] = new Array()
    lineArray2[0].kind = PointKind.CORNERPOINT
    lineArray2[0].anchor = Array(150, 200)
    lineArray2[0].leftDirection = lineArray2[0].anchor
    lineArray2[0].rightDirection = lineArray2[0].anchor

    lineArray2[1] = new PathPointInfo
    lineArray2[1].kind = PointKind.CORNERPOINT
    lineArray2[1].anchor = Array(200, 100)
    lineArray2[1].leftDirection = lineArray2[1].anchor
    lineArray2[1].rightDirection = lineArray2[1].anchor

    lineSubPathArray[1] = new SubPathInfo()
    lineSubPathArray[1].operation = ShapeOperation.SHAPEXOR
    lineSubPathArray[1].closed = false
    lineSubPathArray[1].entireSubPath = lineArray2

//ice cream curve
//it's a curved line, so there are 3 points, not 2
//coordinates for the middle point (lineArray3[1]) are different.
//The left direction is positioned "above" the anchor on the screen.
//The right direction is positioned "below" the anchor
//You can change the coordinates for these points to see
//how the curve works...
var lineArray3[0] = new Array()
    lineArray3[0].kind = PointKind.CORNERPOINT
    lineArray3[0].anchor = Array(200, 100)
    lineArray3[0].leftDirection = lineArray3[0].anchor
    lineArray3[0].rightDirection = lineArray3[0].anchor

    lineArray3[1] = new PathPointInfo
    lineArray3[1].kind = PointKind.CORNERPOINT
    lineArray3[1].anchor = Array(150, 50)
    lineArray31].leftDirection = Array(100, 50)
    lineArray3[1].rightDirection = Array(200, 50)

    lineArray3[2] = new PathPointInfo
    lineArray3[2].kind = PointKind.CORNERPOINT
    lineArray3[2].anchor = Array(100, 100)
    lineArray3[2].leftDirection = lineArray3[2].anchor
    lineArray3[2].rightDirection = lineArray3[2].anchor

    lineSubPathArray[1] = new SubPathInfo()
```

```
   lineSubPathArray[1].operation = ShapeOperation.SHAPEXOR
   lineSubPathArray[1].closed = false
   lineSubPathArray[1].entireSubPath = lineArray3

//create the path item
var myPathItem = docRef.pathItems.add("A Line", lineSubPathArray);

// stroke it so we can see something
myPathItem.strokePath(ToolType.BRUSH)

// Reset the application preferences
preferences.rulerUnits = startRulerUnits;
preferences.typeUnits = startTypeUnits;
displayDialogs = startDisplayDialogs
```

PathItems

The collection of `pathItem` objects in the document. See PathItem for information on `pathItem` objects.

Note: Because the `PathItems` class is a property of the Document object, you use the object name, `pathItems`, rather than the class name, `PathItems`, in your code. For example:

```
var myPathItem = docRef.pathItems.add("A Line", lineSubPathArray)
```

The following sample uses the `PathItems` object incorrectly:

```
var myPathItem = docRef.PathItems.add("A Line", lineSubPathArray)
```

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of `pathItem` objects in the `pathItems` collection.
parent	object (document)	Read-only. The `pathItems` object's container.
typename	string	Read-only. The class name of the referenced `pathItems` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	PathItem	Gets a `pathItem` object from the `pathItems` collection.
add (name, entirePath)	string Array (SubPathItem objects)	PathItem	Creates a new `pathItem` object.
getByName (name)	string	PathItem	Get the first element in the `pathItems` collection with the provided name.
removeAll ()			Removes all `pathItem` objects from the `pathItems` collection.

PathPoint

Information about an array of `PathPointInfo` objects.

Note: You do not use the `PathPoint` object to create points that make up a path. Rather, you use the `PathPoint` object to retrieve information about the points that describe path segments. To create path points, use the `PathPointInfo` objects. See PathPointInfo.

Properties

Property	Value Type	What it is
anchor	`Array(UnitValue)`	Read-write. The point on the curve (`leftDirection`/`rightDirection` are points representing the control handle end points).
kind	`PointKind`	Read-write. The `PathPoint` object's type.
leftDirection	`Array(UnitValue)`	Read-write. The x and y coordinates that define the left handle.
parent	`object (SubPathItem)`	Read-only. The `PathPoint` object's container.
rightDirection	`Array(UnitValue)`	Read-write. The x and y coordinates that define the right handle.
typename	`string`	Read-only. The class name of the referenced `PathPoint` object.

PathPointInfo

A point on a path, expressed as an array of three coordinate arrays: the anchor point, left direction point, and right direction point. For paths that are straight segments (not curved), the coordinates of all three points are the same. For curved segements, the the coordinates are different. The difference between the anchor point and the left or right direction points determines the arc of the curve. You use the left direction point to bend the curve "outward" or make it convex; you use the right direction point to bend the curve "inward" or make it concave.

Properties

Property	Value Type	What it is
anchor	Array	Read-write. The x and y coordinates of one end point of the path segment.
kind	PointKind	Read-write. The PathPointInfo object's kind.
leftDirection	Array (UnitValue)	Read-write. The location of the left direction point ('in' position).
rightDirection	Array (UnitValue)	Read-write. The location of the right handle ('out' position).
typename	string	Read-only. The class name of the referenced PathPointInfo object.

PathPoints

A collection of `PathPoint` objects that comprises the `PathPoints` property of the `SubPathItem` object. See SubPathItem for more information.

Properties

Property	Value Type	What it is
length	`number (long)`	Read-only. The number of elements in the `PathPoints` collection.
parent	`object (SubPathItem)`	Read-only. The `PathPoints` object's container.
typename	`string`	Read-only. The class name of the referenced `PathPoints` object.

Method	Parameter type	Returns	What it does
index `(itemKey)`	`number`	`PathPoint`	Gets an element from the `PathPoints` collection.

PDFOpenOptions

Options that can be specified when opening a document in generic Adobe PDF format.

Properties

Property	Value Type	What it is
antiAlias	boolean	Read-write. Indication of whether to use antialias.
bitsPerChannel	BitsPerChannelType	Read-write. The number of bits per channel.
constrainProportions	boolean	Deprecated for Adobe Photoshop CS2.
cropPage	CropToType	Read-write. The method of cropping to use.
height	UnitValue	Deprecated for Adobe Photoshop CS2.
mode	OpenDocumentMode	Read-write. The color model to use.
name	string	Read-write. The name of the document.
page	number (long)	Read-write. The page to which to open the document.
resolution	number (double)	Read-write. The resolution of the document (in pixels per inch).
suppressWarnings	boolean	Read-write. Indication of whether to suppress warnings when opening the document.
typename	string	Read-only. The class name of the referenced PDFOpenOptions object.
usePageNumber	boolean	Read-write. Indication of whether the value specified in the page property will refer to an image number when usePageNumber = false. See page.
width	UnitValue	Deprecated for Adobe Photoshop CS2.

PDFSaveOptions

Options that can be specified when saving a document in Adobe PDF format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels with the file.
annotations	boolean	Read-write. Indication of whether to save comments with the file.
colorConversion	boolean	Read-write. Indication of whether to convert the color profile to a destination profile.
convertToEightBit	boolean	Read-write. Indication of whether to convert a 16-bit image to 8-bit for better compatibility with other applications.
descripton	string	Read-write. Description of the save options to use.
destinationProfile	string	Read-write. Description of the final RGB or CMYK output device, such as a monitor or a press standard.
downgradeColorProfile	boolean	Deprecated for Adobe Photoshop CS2.
downSample	PDFResample	Read-write. The down sample method to use.
downSampleSize	number (double)	Read-write. The size to downsample images if they exceed the limit in pixels per inch.
downSampleSizeLimit	number (double)	Read-write. Limits downsampling or subsampling to images that exceed this value in pixels per inch.
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in the document.
embedFonts	boolean	Deprecated for Adobe Photoshop CS2.
embedThumbnail	boolean	Read-write. Indication of whether to include a small preview image in Adobe PDF files.
encoding	PDFStandard	Read-write. The encoding method to use (default: PDFEncoding.PDFZIP).
interpolation	boolean	Deprecated for Adobe Photoshop CS2.

Property	Value Type	What it is (Continued)
jpegQuality	number (long)	Read-write. The quality of the produced image (0 - 12), which is inversely proportionate to the compression amount. **Note:** Valid only when `encoding = PDFEncoding.JPEG`.
layers	boolean	Read-write. Indication of whether to save the document's layers.
optimizeForWeb	boolean	Read-write. Indication of whether to improve performance of PDF files on Web servers.
outputCondition	string	Read-write. An optional comment field for inserting descriptions of the output condition. The text is stored in the PDF/X file.
outputConditionID	string	Read-write. Indentifier for the output condition.
PDFCompatibility	PDFCompatibility	Read-write. The PDF version to make the document compatible with.
PDFStandard	PDFStandard	Read-write. The PDF standard to make the document compatible with.
preserveEditing	boolean	Read-write. Indication of whether to reopen the PDF in Adobe Photoshop CS2 with native Photoshop data intact.
presetFile	string	Read-write. The preset file to use for settings. **Note:** This option overrides other settings.
profileInclusionPolicy	boolean	Read-write. Indication of whether to show which profiles to include.
registryName	string	Read-write. URL where the output condition is registered.
spotColors	boolean	Read-write. Indication of whether to save spot colors.
tileSize	nunber (long)	Read-write. Compression option. **Note:** Valid only when `encoding = PDFEncoding.JPEG2000`.
transparency	boolean	Deprecated for Adobe Photoshop CS2.
typename	string	Read-only. The class name of the referenced `PDFSaveOptions` object.

Property	Value Type	What it is (Continued)
useOutlines	boolean	Deprecated for Adobe Photoshop CS2.
vectorData	boolean	Deprecated for Adobe Photoshop CS2.
view	boolean	Read-write. Indication of whether to open the saved PDF in Adobe Acrobat.

PhotoCDOpenOptions

Options to be specified when opening a Kodak Photo CD (PCD) files, including high-resolution files from Pro Photo CD discs.

Properties

Property	Value Type	What it is
colorProfileName	string	Read-write. The profile to use when reading the image.
colorSpace	PhotoCDColorSpace	Read-write. The colorspace for the image.
orientation	Orientation	Read-write. The image orientation.
pixelSize	PhotoCDSize	Read-write. The image dimensions.
resolution	number (double)	Read-write. The image resolution (in pixels per inch).
typename	string	Read-only. The class name of the referenced photoCDOpenOptions object.

PhotoshopSaveOptions

Options that can be specified when saving a document in PSD format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
annotations	boolean	Read-write. Indication of whether to save the annotations.
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in the document.
layers	boolean	Read-write. Indication of whether to preserve the layers.
spotColors	boolean	Read-write. Indication of whether to save the spot colors.
typename	string	Read-only. The class name of the referenced photoshopSaveOptions object.

PICTFileSaveOptions

Options that can be specified when saving a document in PICT format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
compression	PICTCompression	Read-write. (default: PICTCompression.NONE)
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in the document.
resolution	PICTBitsPerPixels	Read-write. The number of bits per pixel.
typename	string	Read-only. The class name of the referenced PICTFileSaveOptions object.

PICTResourceSaveOptions

Options that can be specified when saving a document as a PICT Resource file.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
compression	PICTCompression	Read-write. The type of compression to use (default: PICTCompression.NONE).
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in the document.
name	string	Read-write. The name of the PICT resource.
resolution	PICTBitsPerPixels	Read-write. The number of bits per pixel.
resourceID	number (long)	Read-write. The ID of the PICT resource (default: 128).
typename	string	Read-only. The class name of the referenced PICTResourceSaveOptions object.

PicturePackageOptions

Options that can be specified for a Picture Package.

Properties

Property	Value type	What it is
content	PicturePackageTextType	Read-write. The content information (default: PicturePackageTextType.NONE).
flatten	boolean	Read-write. Indicates whether all layers in the final document are flattened (default: true).
font	GalleryFontType	Read-write. The font used for security text (default: GalleryFontType.ARIAL).
fontSize	number (long)	Read-write. The font size used for security text (default: 12).
layout	string	Read-write. The layout to use to generate the picture package (default: "(2)5x7").
mode	NewDocumentMode	Read-write. Read-write. The color profile to use as the document mode (default: NewDocumentMode.RGB).
opacity	number (long)	Read-write. The web page security opacity as a percent (default: 100).
resolution	number (double)	Read-write. The resolution of the document in pixels per inch (default: 72.0).
text	string	Read-write. The picture package custom text. **Note:** Valid only when content = PicturePackageType.USER. See content.
textColor	RGBColor	Read-write. The color to use for security text.
textPosition	GallerySecurityTextPositionType	Read-write. The security text position (default: GallerySecurityTextPositionType.CENTERED).
textRotate	GallerySecurityTextRotateType	Read-write. The orientation to use for security text (default: GallerySecurityTextRotateType.ZERO).
typename	string	Read-only. The class name of the referenced PicturePackageOptions object.

PixarSaveOptions

Options that can be specified when saving a document in Pixar format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
typename	string	Read-only. The class name of the referenced PixarSaveOptions object.

PNGSaveOptions

Options that can be specified when saving a document in PNG format.

Properties

Property	Value Type	What it is
interlaced	boolean	Read-write. Indicates whether the should rows be interlaced (default: false).
typename	string	Read-only. The class name of the referenced PNGSaveOptions object.

Preferences

Options to define for the `preferences` property of the `app` object. See preferencesFolder (in the Properties table for the `app` object).

Note: Because the `Preferences` class is a property of the Document object, you use the object name, `preferences`, rather than the class name, `Preferences`, in your code. For example:

```
app.preferences.rulerUnits = Units.PIXELS
app.preferences.typeUnits = TypeUnits.PIXELS
```

The following code incorrectly uses an upper case *P*:

```
app.Preferences.rulerUnits = Units.PIXELS
app.Preferences.typeUnits = TypeUnits.PIXELS
```

Note: Defining the `preferences` properties is basically equivalent to selecting Edit > Preferences (Windows) or Photoshop > Preferences in the Adobe Photoshop CS2 application. For explanations of individual settings, please refer to Adobe Photoshop CS2 Help.

Properties

Property	Value Type	What it is
additionalPluginFolder	`file`	Read-write. The path to an additional plug-in folder. **Note:** Valid only when `useAdditionalPluginFolder = true`. See useAdditionalPluginFolder.
appendExtension	`SaveBehavior`	Read-write. Save files with extensions on Windows.
askBeforeSavingLayeredTIFF	`boolean`	Read-write. Indication of whether to ask the user to verify layer preservation options when saving a file in TIFF format.
autoUpdateOpenDocuments	`boolean`	Read-write. Indication of whether to automatically update open documents.
beepWhenDone	`boolean`	Read-write. Indication of whether to beep when a process finishes.
colorChannelsInColor	`boolean`	Read-write. Indication of whether to display component channels in the Channels palette in color.
colorPicker	`ColorPicker`	Read-write.
columnGutter	`number (double)`	Read-write. The width of the column gutters (in points). (0.1 - 600.0).
columnWidth	`number (double)`	Read-write. Column width (in points) (0.1 - 600.0).

Property	Value Type	What it is (Continued)
createFirstSnapshot	boolean	Read-write. Indication of whether to automatically make the first snapshot when a new document is created.
dynamicColorSliders	boolean	Read-write. Indication of whether dynamic color sliders appear in the Color palette.
editLogItems	EditLogItemsType	Read-write. The options for editing history log items. **Note:** Valid only when useHistoryLog = true. See useHistoryLog.
exportClipboard	boolean	Read-write. Indication of whether to retain Adobe Photoshop CS2 contents on the clipboard after you exit the application.
fontPreviewSize	FontPreviewType	Read-write. Indication of whether to show font previews in the type tool font menus.
fullSizePreview	boolean	Read-write. (Mac only.) Indication of whether to show image preview as a full size image or thumb**nail.**
gamutWarningOpacity	number (double)	Read-write. (0 - 100 as percent).
gridSize	GridSize	Read-write. The size to use for squares in the grid.
gridStyle	GridLineStyle	Read-write. The formatting style for non-printing grid lines.
gridSubDivisions	number (long)	Read-write. (1 - 100)
guideStyle	GuideLineStyle	Read-write. The formatting style for non-printing guide lines.
iconPreview	boolean	Read-write. (Mac only.)
imageCacheForHistograms	boolean	Read-write. Indication of whether to use the sampled data cache for histograms in the Level dialog (faster but not as accurate).
imageCacheLevels	number (long)	Read-write. The number of images to hold in the cache (1 - 8).
imagePreviews	SaveBehavior	Read-write. The behavior mode to use when saving files.
interpolation	ResampleMethod	Read-write. The method to use to assign color values to any new pixels created when an image is resampled or resized.

Property	Value Type	What it is (Continued)
keyboardZoomResizesWindows	boolean	Read-write. Indication of whether to automatically resize the window when zooming in or out using keyboard shortcuts.
macOSThumbnail	boolean	Read-write. (Mac only.) Indication of whether to create a thumbnail when saving the image.
maximizeCompatibility	QueryStateType	Read-write. The behavior to use to check whether to maximize compatibility when opening Adobe Photoshop CS2 (PSD) files .
maxRAMuse	number (long)	Read-write. The maximum percentage of available RAM used by Adobe Photoshop CS2 (5 - 100).
nonLinearHistory	boolean	Read-write. Indication of whether to allow non-linear history.
numberofHistoryStates	number (long)	Read-write. The number of history states to preserve (1 - 100).
otherCursors	OtherPaintingCursors	Read-write. The type of pointer to use.
paintingCursors	PaintingCursors	Read-write. The type of pointer to use.
parent	object (Application)	Read-write. The preferences object's container.
pixelDoubling	boolean	Read-write. Indication of whether to halve the resolution or (double the size of pixels) to make previews display more quickly.
pointSize	PointType	Read-write. The point/pica size.
recentFileListLength	number (long)	Read-write. The number of items in the recent file list (0 - 30).
rulerUnits	Units	Read-write. The unit the scripting system will use when receiving and returning values.
saveLogItems	SaveLogItemsType	Read-write. The options for saving the history items.
saveLogItemsFile	file	Read-write. The path to the history log file.
savePaletteLocations	boolean	Read-write. Indication of whether to make new palette locations the default location.

Property	Value Type	What it is (Continued)
showAsianTextOptions	boolean	Read-write. Indication of whether to display Asian text options in the Paragraph palette.
showEnglishFontNames	boolean	Read-write. Indication of whether to list Asian font names in English.
showSliceNumber	boolean	Read-write. Indication of whether to display slice numbers in the document window when using the Slice tool.
showToolTips	boolean	Read-write. Indication of whether to show pop up definitions on mouse over.
smartQuotes	boolean	Read-write. Indication of whether to use curly or straight quote marks.
typename	string	Read-only. The class name of the referenced `preferences` object.
typeUnits	TypeUnits	Read-write. The unit type-size that the numeric inputs are assumed to represent.
useAdditionalPluginFolder	boolean	Read-write. Indication of whether to use an additional folder for compatible plug-ins stored with a different application.
useDiffusionDither	boolean	Read-write. Indication of whether to use diffusion dithering to minimize distinctive patterning caused by pattern dithering.
useHistoryLog	boolean	Read-write. Indication of whether to create a log file for history states.
useLowerCaseExtension	boolean	Read-write. Indicates whether the file extension should be lowercase.
useShiftKeyForToolSwitch	boolean	Read-write. Indication of whether to enable cycling through a set of hidden tools.
useVideoAlpha	boolean	Read-write. Indication of whether to enable Adobe Photoshop CS2 to send transparency information to your computer's video board. (Requires hardware support.)
windowsThumbnail	boolean	Read-write. (Requires hardware support.) Indication of whether to create a thumbnail when saving the image on Windows.

PresentationOptions

Options that can be specified for Adobe PDF presentations.

Properties

Property	Value Type	What it is
autoAdvance	boolean	Read-write. Indication of whether to auto advance images when when viewing the presentation (default: true). **Note:** Valid only when presentation = true. See presentation.
includeFilename	boolean	Read-write. Indication of whether to include the file name for the image (default: false).
interpolation	boolean	Read-write. Indication of whether to use image interpolation (default: false).
loop	boolean	Read-write. Indication of whether to begin the presentation again after the last page (default: false). **Note:** Valid only when autoAdvance = true. See autoAdvance.
magnification	MagnificationType	Read-write. The magnification type to use when viewing the image.
pDFFileOptions	PDFSaveOptions	Read-write. Options to use when creating the PDF file.
presentation	boolean	Read-write. Indication of whether the output will be a presentation (default: false); when false, the output is a Multi-Page document.
transition	TransitionType	Read-write. The transition from one image to the next (default: TransitionType.NONE). **Note:** Valid only when autoAdvance = true. See autoAdvance.
typename	string	Read-only. The class name of the referenced PresentationOptions object.

RawFormatOpenOptions

Options that can be specified when opening a document in RAW format.

Properties

Property	Value Type	What it is
bitsPerChannel	number (long)	Read-write. The number of bits for each channel. **Note:** The only valid values are `bitsPerChannel = BitsPerChannelType.EIGHT` or `bitsPerChannel = BitsPerChannelType.SIXTEEN`.
byteOrder	ByteOrder	Read-write. The order in which bytes will be read. **Note:** Valid only when `bitsPerChannel = BitsPerChannelType.SIXTEEN`. See bitsPerChannel.
channelNumber	number (long)	Read-write. The number of channels in the image (1 - 56). **Note:** The value of `channelNumber` cannot exceed the number of channels in the image. When `bitsPerChannel = BitsPerChannelType.SIXTEEN`, only the following values are valid: 1, 3, or 4. See bitsPerChannel.
headerSize	number (long)	Read-write. The number of bytes of information that will appear in the file before actual image information begins; that is, the number of zeroes inserted at the beginning of the file as placeholders (0 - 1919999).
height	number (long)	Read-write. The height of the image (in pixels).
interleaveChannels	boolean	Read-write. Indication of whether to store color values sequentially.
retainHeader	boolean	Read-write. Indication of whether to retain the header when saving. **Note:** Valid only when headerSize is 1 or greater.
typename	string	Read-only. The class name of the referenced `RawFormatOpenOptions` object.
width	number (long)	Read-write. The image width in pixels.

RawSaveOptions

Options that can be specified when saving a document in RAW format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indicates whether alpha channels should be saved.
spotColors	boolean	Read-write. Indicates whether the spot colors should be saved.
typename	string	Read-only. The class name of the referenced RawSaveOptions object.

RGBColor

The definition of a color in RGB color mode.

Properties

Property	Value Type	What it is
blue	number (double)	Read-write. The blue color value (0.0 - 255.0; default: 255.0).
green	number (double)	Read-write. The green color value (0.0 - 255.0; default: 255.0).
hexValue	string	Read-write. The hex representation of the color.
red	number (double)	Read-write. The red color value (0.0 - 255.0; default: 255.0).
typename	string	Read-only. The class name of the referenced RGBColor object.

Selection

The selected area of a document or layer.

Note: Because the `Selection` class is a property of the Document object, you use the object name, `selection`, rather than the class name, `Selection`, in your code, as in the following example:

```
checkersDoc.selection.fill(app.foregroundColor)
```

Properties

Property	Value Type	What it is
bounds	`array of UnitValues`	Read-only. The bounding rectangle of the entire selection.
parent	`object (Document)`	Read-only. The object's container.
typename	`string`	Read-only. The class name of the referenced `selection` object.

Methods

Method	Parameter Type	Returns	What it does
clear `()`			Clears the selection and does not copy it to the clipboard.
contract `(by)`	`UnitValue`		Contracts the selection by the specified amount.
copy `([merge])`	`boolean`		Copies the selection to the clipboard. When the optional argument is used and set to `true`, a merged copy is performed (all visible layers in the selection are copied).
cut `()`			Clears the current selection and copies it to the clipboard.
deselect `()`			Deselects the current selection.
expand `(by)`	`UnitValue`		Expands the selection by the specified amount.
feather `(by)`	`UnitValue`		Feathers the edges of the selection by the specified amount.

Method	Parameter Type	Returns	What it does (Continued)
fill (filltype [, mode] [, opacity] [, preserveTransparency])	Object (SolidColor, ArtLayer, HistoryState); or String ColorBlendMode number (long) boolean		Fills the selection (opacity: 1 - 100 as percent).
grow (tolerance, antiAlias)	number (long) boolean		Grows the selection to include all adjacent pixels falling within the specified tolerance range.
invert ()			Inverts the selection (deselects the selection and selects the rest of the layer or document). **Note:** To flip the selection shape, see rotate.
load (from [, combination] [, inverting])	Channel SelectionType boolean		Loads the selection from the specified channel.
makeWorkPath ([tolerance])	number (double)		Makes this selection item the work path for this document.
resize ([horizontal] [, vertical] [, anchor])	number (double) number (double) AnchorPosition		Resizes the selected area to the specified dimensions and anchor position.
resizeBoundary ([horizontal] [, vertical] [, anchor])	number (double) number (double) AnchorPosition		Changes the size of the selection to the specified dimensions around the specified anchor.
rotate (angle [, anchor])	number (double) AnchorPosition		Rotates the selection by the specified amount around the specified anchor point.
rotateBoundary (angle [, anchor])	number (double) AnchorPosition		Rotates the boundary of the selection around the specified anchor.
select (region [, type] [, feather] [, antiAlias])	Array (points: Array (Array (x,y),...) SelectionType number (double) boolean		Selects the specified region.
selectAll ()			Selects the entire layer.

Method	Parameter Type	Returns	What it does (Continued)
selectBorder (width)	UnitValue		Selects the selection border only (in the specified width); subsequent actions do not affect the selected area within the borders.
similar (tolerance, antiAlias)	number (long) boolean		Grows the selection to include pixels throughout the image falling within the tolerance range.
smooth (radius)	number (long)		Cleans up stray pixels left inside or outside a color-based selection (within the radius specified in pixels).
store (into [, combination])	Channel SelectionType		Saves the selection as a channel.
stroke (strokeColor, width [, location] [, mode] [, opacity] [, preserveTransparency])	Object (color) number (long) StrokeLocation ColorBlendMode number (long) boolean		Strokes the selection border (opacity: 1 - 100 as percent).
translate ([deltaX] [, deltaY])	UnitValue UnitValue		Moves the entire selection relative to its current position.
translateBoundary ([deltaX] [, deltaY])	UnitValue UnitValue		Moves the selection relative to its current position.

Sample Script

The following script creates a checkerboard using the following steps:

- Create an 800 x 800 pixel document.
- Divide the entire document into 100 x 100 pixel squares.
- Select every other square in the first row, then shift the selection criteria to select the alternate squares in the following row. Repeat until every other square in the document is selected.
- Fill the selected squares with the foreground color from the palette.
- Invert the selection and fill the newly selected squares with the background color from the palette.
- Deselect the squares to remove the selection outlines (the “marching ants").

Selection.jsx

```
// Save the current preferences
var startRulerUnits = app.preferences.rulerUnits
var startTypeUnits = app.preferences.typeUnits
```

```
var startDisplayDialogs = app.displayDialogs

// Set Adobe Photoshop CS2 to use pixels and display no dialogs
app.preferences.rulerUnits = Units.PIXELS
app.preferences.typeUnits = TypeUnits.PIXELS
app.displayDialogs = DialogModes.NO

//Close all the open documents
while (app.documents.length) {
   app.activeDocument.close()
}

//Create variables for the 800 pixel board divided in even 100 x 100 squares
var docSize = 800
var cells = 8
var cellSize = docSize / cells

// create a new document
var checkersDoc = app.documents.add(docSize, docSize, 72, "Checkers")

// Create a variable to use for selecting the checker board
// That allows me to shift the selection one square to the right
//on every other row, and then shift back for the rows in between.
var shiftIt = true

// loop through vertically to create the first row
for (var v = 0; v < docSize; v += cellSize) {

   // Switch the shift for a new row
   shiftIt = !shiftIt

   // loop through horizontally
   for (var h = 0; h < docSize; h += (cellSize * 2)) {

         // push over the cellSize to start with only
         if (shiftIt && h == 0) {
            h += cellSize
      }

         // Select a square
         selRegion = Array(Array(h, v),
                     Array(h + cellSize, v),
                     Array(h + cellSize, v + cellSize),
                     Array(h, v + cellSize),
                     Array(h, v))

         // In the first ineration of the loop, start the selection
         //In subsequent iterations, use the EXTEND constant value
         //of the select() method to add to the selection (in the loop's else clause)
         if (h == 0 && v == 0) {
            checkersDoc.selection.select(selRegion)
         } else {
            checkersDoc.selection.select(selRegion, SelectionType.EXTEND)
      }

         // turn this off for faster execution
         // turn this on for debugging
         WaitForRedraw()
   }
}
```

```
// Fill the current selection with the foreground color
checkersDoc.selection.fill(app.foregroundColor)

//Invert the selection
checkersDoc.selection.invert()

// Fill the new selection with the background color
checkersDoc.selection.fill(app.backgroundColor)

// Clear the selection to get rid of the non-printing borders
checkersDoc.selection.deselect()

// Reset the application preferences
app.preferences.rulerUnits = startRulerUnits
app.preferences.typeUnits = startTypeUnits
app.displayDialogs = startDisplayDialogs

// A helper function for debugging
// It also helps the user see what is going on
// if you turn it off for this example you
// get a flashing cursor for a number (long) time
function WaitForRedraw()
{
   var eventWait = charIDToTypeID('Wait')
   var enumRedrawComplete = charIDToTypeID('RdCm')
   var typeState = charIDToTypeID('Stte')
   var keyState = charIDToTypeID('Stte')

   var desc = new ActionDescriptor()

   desc.putEnumerated(keyState, typeState, enumRedrawComplete)

   executeAction(eventWait, desc, DialogModes.NO)
}
```

SGIRGBSaveOptions

Options that can be specified when saving a document in SGIRGB format.

Note: The SGIRGB format is not installed automatically with Adobe Photoshop CS2.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
spotColors	boolean	Read-write. Indication of whether to save the spot colors.
typename	string	Read-only. The class name of the referenced SGIRGBSaveOptions object.

SolidColor

A color definition used in the document.

Properties

Property	Value Type	What it is
cmyk	CMYKColor	Read-write. The CMYK color mode.
gray	GrayColor	Read-write. The Grayscale color mode.
hsb	HSBColor	Read-write. The HSB color mode.
lab	LabColor	Read-write. The LAB color mode.
model	ColorModel	Read-write. The color model.
nearestWebColor	RGBColor	Read-only. The nearest web color to the current color.
rgb	RGBColor	Read-write. The RGB color mode.
typename	string	Read-only. The class name of the referenced SolidColor object.

Methods

Method	Parameter Type	Returns	What it does
isEqual (color)	SolidColor	boolean	Indication of whether the SolidColor object is visually equal to the specified color.

SubPathInfo

An array of `PathPointInfo` objects that describes a straight or curved segment of a path.

Properties

Property	Value Type	What it is
closed	`boolean`	Read-write. Indication of whether the path describes an enclosed area.
entireSubPath	`Array (PathPoint objects)`	Read-write.
operation	`ShapeOperation`	Read-write. The sub path's operation on other sub paths.
typename	`string`	Read-only. The class name of the referenced `SubPathInfo` object.

SubPathItem

Information about a path.

Note: You do not use the `SubPathItem` object to create a path. Rather, you use the `SubPathInfo` object to retrieve information about a path. (Note that all of the `SubPathItem` object's properties are *Read-only*.) To create path segments, see SubPathInfo.

Properties

Property	Value Type	What it is
closed	boolean	Read-only. Indicates whether the path is closed.
operation	ShapeOperation	Read-only. The sub path operation on other sub paths.
parent	object (PathItem)	Read-only. The object's container.
pathPoints	PathPoints	Read-only. The `PathPoints` collection.
typename	string	Read-only. The class name of the referenced `SubPathItem` object.

SubPathItems

A collection of `SubPathItem` objects. See SubPathItem.

Properties

Property	Value Type	What it is
length	`number (long)`	Read-only. The number of elements in the `SubPathItems` collection.
parent	`object (PathItem)`	Read-only. The `SubPathItems` object's container.
typename	`string`	Read-only. The class name of the referenced `SubPathItems` object.

Methods

Method	Parameter type	Returns	What it does
index `(itemKey)`	`number`	`SubPathItem`	Gets an element from the `SubPathItems` collection.

TargaSaveOptions

Options that can be set when saving a document in TGA (Targa) format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
resolution	TargaBitsPerPixels	Read-write. The number of bits per pixel (default: TargaBitsPerPixels.TWENTYFOUR).
rleCompression	boolean	Read-write. Indicates whether RLE compression should be used (default: true).
typename	string	Read-only. The class name of the referenced TargaSaveOptions object.

TextFont

Details about a font in the `TextFonts` collection. See TextFonts for more information on the `TextFonts` collection.

Properties

Property	Value Type	What it is
family	string	Read-only. The font family.
name	string	Read-only. The name of the font.
parent	object (Application)	Read-only. The object's container.
postScriptName	string	Read-only. The PostScript name of the font.
style	string	Read-only. The font style.
typename	string	Read-only. The class name of the referenced `textFont` object.

TextFonts

The collection of fonts available on your computer.

Note: The `TextFonts` class corresponds to the `fonts` property of the `TextFonts` object. In a script, you use the object name `fonts` , rather than the class name `TextFonts`, to refer to a `TextFonts` object. The following example uses the length property to determine, and then display, the number of `TextFonts` installed on the machine.

- Correct:

```
alert(app.fonts.length)
```

- Incorrect:

```
alert(app.TextFonts.length)
```

See `Application`, specifically the `fonts` property, for more information.

Properties

Property	Value Type	What it is
length	number (long)	Read-only. The number of elements in the `TextFonts` collection.
parent	object (`Application`)	Read-only. The object's container.
typename	string	Read-only. The class name of the referenced `TextFonts` object.

Methods

Method	Parameter Type	Returns	What it does
index (itemKey)	number	`TextFont`	Gets an element from the `TextFonts` collection.
getByName (name)	string	`TextFont`	Gets the first element in the `TextFonts` collection with the provided name.

TextItem

The text in an `artLayer` object whose `kind` property is `LayerKind.TEXT`. See ArtLayer, specifically the `kind` property, for more information.

Note: Because the `TextItem` class is a property of the `ArtLayer` class, you use the object name, `textItem`, rather than the class name, `TextItem`, in your code. For example:

```
myLayers[i].textItem.contents = "Layer in " + textArray[i] + " Set Inside "
```

Properties

Property	Value Type	What it is
alternateLigatures	`boolean`	Read-write. Indication of whether to use alternate ligatures. **Note:** Alternate ligatures are the same as Discretionary Ligatures. Please refer to Adobe Photoshop CS2 Help for more information.
antiAliasMethod	AntiAlias	Read-write. The method of anti aliasing to use.
autoKerning	AutoKernType	Read-write. The auto kerning option to use.
autoLeadingAmount	`number (double)`	Read-write. The percentage to use for auto (default) leading (0.01 - 5000.00 in points). **Note:** Valid only when `useAutoLeading = true`. See useAutoLeading.
baselineShift	`UnitValue`	Read-write. The unit value to use in the baseline offset of text.
capitalization	TextCase	Read-write. The text case.
color	SolidColor	Read-write. The text color.
contents	`string`	Read-write. The actual text in the layer.
desiredGlyphScaling	`number (double)`	Read-write. The desired amount (percentage) to scale the horizontal size of the text letters (50 - 200; at 100, the width of characters is not scaled). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED`; `justification = Justification.FULLYJUSTIFIED`; `justification = Justification.LEFTJUSTIFIED`; or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumGlyphScaling and maximumGlyphScaling.

Property	Value Type	What it is (Continued)
desiredLetterScaling **Note:** 'Letter Scaling' is basically equivalent to 'Letter Spacing' in the Adobe Photoshop CS2 application Justification dialog (Select Justification on the Paragraphs palette menu).	number (double)	Read-write. The amount of space between letters (100 - 500; at 0, no space is added between letters). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumLatterScaling and maximumLetterScaling.
desiredWordScaling **Note:** 'Word Scaling' is basically equivalent to 'Word Spacing' in the Adobe Photoshop CS2 application Justification dialog (Select Justification on the Paragraphs palette menu).	number (double)	Read-write. The amount (percentage) of space between words (0 -1000; at 100, no additional space is added between words). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumWordScaling and maximumWordScaling.
direction	Direction	Read-write. The text orientation.
fauxBold	boolean	Read-write. Indication of whether to use faux bold (default: `false`). **Note:** Using `fauxBold.true` is equivalent to selecting text and clicking the Faux Bold button in the Character palette.
fauxItalic	boolean	Read-write. Indication of whether to use faux italic (default: `false`). **Note:** Using `fauxItalic.true` is equivalent to selecting text and clicking the Faux Italic button in the Character palette.
firstLineIndent	UnitValue	Read-write. The amount (unit value) to indent the first line of paragraphs (-1296 - 1296).
font	string	Read-write. The text face of the character.

Property	Value Type	What it is (Continued)
hangingPunctuation	boolean	Read-write. Indication of whether to use roman Hanging Punctuation.
height	UnitValue	Read-write. The height of the bounding box (unit value) for paragraph text. **Note:** Valid only when `kind = TextType.PARAGRAPHTEXT`. See kind.
horizontalScale	number (long)	Read-write. Character scaling (horizontal) in proportion to vertical scale (0 - 1000 in percent). See verticalScale.
hyphenateAfterFirst	number (long)	Read-write. The number of letters after which hyphenation in word wrap is allowed (1 - 15).
hyphenateBeforeLast	number (long)	Read-write. The number of letters before which hyphenation in word wrap is allowed (1 - 15).
hyphenateCapitalWords	boolean	Read-write. Indication of whether to allow hyphenation in word wrap of capitalized words.
hyphenateWordsLongerThan	number (long)	Read-write. The minimum number of letters a word must have in order for hyphenation in word wrap to be allowed (2 - 25).
hyphenation	boolean	Read-write. Indication of whether to use hyphenation in word wrap.
hyphenationZone	UnitValue	Read-write. The distance at the end of a line that will cause a word to break in unjustified type (0 - 720 pica).
hyphenLimit	number (long)	Read-write. The maximum number of consecutive lines that can end with a hyphenated word.
justification	Justification	Read-write. The paragraph justification.
kind	TextType	Read-write. The text-wrap type.
language	Language	Read-write. The language to use.
leading	UnitValue	Read-write. The leading amount (unit value).
leftIndent	UnitValue	Read-write. The amount (unit value) of space to indent text from the left (-1296 - 1296).
ligatures	boolean	Read-write. Indication of whether to use ligatures.

Property	Value Type	What it is (Continued)
maximumGlyphScaling	number (double)	Read-write. The maximum amount (percentage) to scale the horizontal size of the text letters (50 - 200; at 100, the width of characters is not scaled). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumGlyphScaling and desiredGlyphScaling.
maximumLetterScaling **Note:** 'Letter Scaling' is basically equivalent to 'Letter Spacing' in the Adobe Photoshop CS2 application Justification dialog (Select Justification on the Paragraphs palette menu).	number (double)	Read-write. The maximum amount of space to allow between letters (100 - 500; at 0, no space is added between letters). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumLatterScaling and desiredLetterScaling.
maximumWordScaling **Note:** 'Word Scaling' is basically equivalent to 'Word Spacing' in the Adobe Photoshop CS2 application Justification dialog (Select Justification on the Paragraphs palette menu).	number (double)	Read-write. The maximum amount (percentage) of space to allow between words (0 -1000; at 100, no additional space is added between words). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumWordScaling and desiredWordScaling.

Property	Value Type	What it is (Continued)
minimumGlyphScaling	number (double)	Read-write. The minimum amount (percentage) to scale the horizontal size of the text letters (50 - 200; at 100, the width of characters is not scaled). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: minimumGlyphScaling and desiredGlyphScaling.
minimumLatterScaling **Note:** 'Letter Scaling' is basically equivalent to 'Letter Spacing' in the Adobe Photoshop CS2 application Justification dialog (Select Justification on the Paragraphs palette menu).	number (double)	Read-write. The minimum amount (percentage) of space between letters (100 - 500; at 0, no space is removed between letters). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: maximumLetterScaling and desiredLetterScaling.
minimumWordScaling **Note:** 'Word Scaling' is basically equivalent to 'Word Spacing' in the Adobe Photoshop CS2 application Justification dialog (Select Justification on the Paragraphs palette menu).	number (double)	Read-write. The minimum amount (percentage) of space between words (0 -1000; at 100, no space is removed between words). **Note:** Valid only when `justification = Justification.CENTERJUSTIFIED; justification = Justification.FULLYJUSTIFIED; justification = Justification.LEFTJUSTIFIED;` or `justification = Justification.RIGHTJUSTIFIED`. See justification. The following values are also required: maximumWordScaling and desiredWordScaling.

Property	Value Type	What it is (Continued)
noBreak	boolean	Read-write. Indication of whether to allow words to break at the end of a line. **Tip:** When enacted on large amounts of consecutive characters, `noBreak = true` can prevent word wrap and thus may prevent some text from appearing on the screen.
oldStyle	boolean	Read-write. Indication of whether to use old style type.
parent	object (ArtLayer)	Read-write. The `textItem` object's container.
position	Array (UnitValue)	Read-write. The position of origin for the text. The array must contain two values (unit value). **Tip:** Setting the `position` property is basically equivalent to clicking the text tool at a point in the document to create the point of origin for text.
rightIndent	UnitValue	Read-write. The amount of space (unit value) to indent text from the right (-1296 - 1296).
size	number (double)	Read-write. The font size in points.
spaceAfter	UnitValue	Read-write. The amount of space (unit value) to use after each paragraph (-1296 - 1296).
spaceBefore	UnitValue	Read-write. The amount of space (unit value) to use before each paragraph (-1296 - 1296).
strikeThru	StrikeThruType	Read-write. The text strike through option to use.
textComposer	TextComposer	Read-write. The composition method to use to evaluate line breaks and optimize the specified hyphenation and justification options. **Note:** Valid only when `kind = TextType.PARAGRAPHTEXT`. See kind.
tracking	number (double)	Read-write. The amount of uniform spacing between multiple characters (-1000 - 10000). **Note:** Tracking units are 1/1000 of an em space. The width of an em space is relative to the current type size. In a 1-point font, 1 em equals 1 point; in a 10-point font, 1 em equals 10 points. So, for example, 100 units in a 10-point font are equivalent to 1 point.
typename	string	Read-only. The class name of the referenced `textItem` object.
underline	UnderlineType	Read-write. The text underlining options.

Property	Value Type	What it is (Continued)
useAutoLeading	boolean	Read-write. Indication of whether to use a font's built-in leading information.
verticalScale	number (long)	Read-write. Character scaling (vertical) in proportion to horizontal scale (0 - 1000 in percent). See horizontalScale.
warpBend	number (double)	Read-write. The warp bend percentage (-100 - 100).
warpDirection	Direction	Read-write. The warp direction.
warpHorizontalDistortion	number (double)	Read-write. The horizontal distortion (as percentage) of the warp (-100 - 100).
warpStyle	WarpStyle	Read-write. The style of warp to use.
warpVerticalDistortion	number (double)	Read-write. The vertical distortion (as percentage) of the warp (-100 - 100).
width	UnitValue	Read-write. The width of the bounding box (unit value) for paragraph text. **Note:** Valid only when `kind = TextType.PARAGRAPHTEXT`. See kind.

Methods

Method	Parameter Type	Returns	What it does
convertToShape ()			Converts the text item and its containing layer to a fill layer with the text changed to a clipping path.
createPath ()			Creates a clipping path from the outlines of the actual text items (such as letters or words).

TiffSaveOptions

Options that can be specified when saving a document in TIFF format.

Properties

Property	Value Type	What it is
alphaChannels	boolean	Read-write. Indication of whether to save the alpha channels.
annotations	boolean	Read-write. Indication of whether to save the annotations.
byteOrder	ByteOrder	Read-write. The order in which the document's bytes will be read. (The default is ByteOrder.MACOS when running on MacOS and ByteOrder.IBM when running on a PC.)
embedColorProfile	boolean	Read-write. Indication of whether to embed the color profile in the document.
imageCompression	TIFFEncoding	Read-write. The compression type (default: TIFFEncoding.NONE).
interleaveChannels	boolean	Read-write. Indication of whether the channels in the image will be interleaved.
jpegQuality	number (long)	Read-write. The quality of the produced image (0 - 12), which is inversely proportionate to the amount of JPEG compression. **Note:** Valid only when imageCompression = TIFFEncoding.JPEG.
layerCompression	LayerCompression	Read-write. The method of compression to use when saving layers (as opposed to saving composite data). **Note:** Valid only when layers = true. See layers
layers	boolean	Read-write. Indication of whether to save the layers.
saveImagePyramid	boolean	Read-write. Indication of whether to preserve multi-resolution information (default: false).
spotColors	boolean	Read-write. Indication of whether to save the spot colors.
transparency	boolean	Read-write. Indication of whether to save the transparency as an additional alpha channel when the file is opened in another application.
typename	string	Read-only. The class name of the referenced tiffSaveOptions object.

xmpMetadata

Camera raw image file settings stored in an XMP file in the same folder as the raw file with the same base name and an XMP extension.

Properties

Property	Value Type	What it is
parent	object (Document)	Read-only. The object's container.
rawData	string	Read-only. The raw XML form of file information.
typename	string	Read-only. The class name of the referenced xmpMetadata object.

3 Action Manager

Adobe Photoshop CS2 actions allow you to save time by automating repetitive tasks. You create and run actions in the application interface using the Actions palette.

You can also manage actions in scripts using a utility called the *Action Manager*. The Action Manager allows you to write scripts that target Adobe Photoshop CS2 functionality that is not otherwise accessible in the scripting interface, such as third party plug-ins and filters. The only requirement for using the Action Manager is that the task that you want to access from the Action Manager is recordable.

This chapter describes how to use the Action Manager and the scripting interface objects it includes.

The ScriptListener Plug-In

Before you use the Action Manager, you must install the ScriptListener plug-in. ScriptListener records a file with scripting code corresponding to the actions you perform in the UI.

Tip: Because ScriptListener records most of your actions, install ScriptListener only when you are creating Action Manager. Leaving ScriptListener installed continuously will not only create large files that occupy memory on your hard drive, it can slow Adobe Photoshop CS2 performance.

When you perform a task or series of tasks in Adobe Photoshop CS2, ScriptListener creates a file, `ScriptingListenerJS.log`, which contains JavaScript code that represents your actions.

- On Windows, ScriptListener places file the file on your C:\ drive.
- On Mac OS, ScriptListener creates the file on the desktop.

Note: There is no AppleScript interface to the Action Manager. However, you can access the Action Manager from an AppleScript by executing a JavaScript via the AppleScript.

Installing ScriptListener

The ScriptListener plug-in is located in the `..\Adobe Photoshop CS2\Scripting Guide\Utilities` folder.

➤ **To install the ScriptListener:**

1. Select the file `ScriptListener.8li` and then choose Edit > Copy.
2. Paste the file copy to the following location:

   `..\Adobe Photoshop CS\Plug-Ins\Adobe Photoshop Only\Automate`
3. Open Adobe Photoshop CS2.

   Note: If Adobe Photoshop CS2 is already open, close it and then start it again.

➤ **To uninstall the ScriptListener:**

1. Close Adobe Photoshop CS2.

2. Verify that a copy of the file `ScriptListener.8li` still exists in the `..\Adobe Photoshop CS2\Scripting Guide\Utilities` folder.
3. Delete the file `ScriptListener.8li` from the following location:

   `..\Adobe Photoshop CS\Plug-Ins\Adobe Photoshop Only\Automate`
4. Delete the log file `ScriptingListenerJS.log` from your C:\ drive (Windows) or desktop (Mac OS).

Note: In Windows, even though you remove the ScriptListener from the Automate folder, it may continue to record actions. To prevent the `ScriptingListenerJS.log` file from becoming too large, delete it each time you finish playing a Adobe Photoshop CS2 action.

Action Manager Scripting Objects

The objects ActionDescriptor, ActionList and ActionReference are part of the Action Manager functionality.

Using the Action Manager from JavaScript

The section demonstrates how to create the `ScriptingListenerJS.log` log file and use its contents to create your script.

The procedures in this section uses the Action Manager to make the Emboss filter available to the scripting interface. (By default, the Emboss filter is available only via the Adobe Photoshop CS2 interface.)

Note: ScriptListener must be installed in the `Automate` folder before you begin the following procedure. See Installing ScriptListener.

➤ **To make the Emboss filter scriptable:**

1. Open Adobe Photoshop CS2, then open a document.
2. Choose Window > Actions, then choose New Action from the Actions palette menu.
3. Name the action, then click Record.
4. Choose Filter > Stylize > Emboss.
5. Using the following settings:
   - Angle: 135
   - Height: 3
   - Amount: 100
6. Do one of the following:
   - In Windows, open `C:\ScriptingListenerJS.log`.

- On Mac OS, open `ScriptingListenerJS.log` on the desktop.

At the end of the file you will see code similar to the following (although your numbers may be different):

```
var id19 = charIDToTypeID( "Embs" );
var desc4 = new ActionDescriptor();
var id20 = charIDToTypeID( "Angl" );
desc4.putInteger( id20, 135 );
var id21 = charIDToTypeID( "Hght" );
desc4.putInteger( id21, 3 );
var id22 = charIDToTypeID( "Amnt" );
desc4.putInteger( id22, 100 );
executeAction( id19, desc4 );
```

Note: ScriptListener separates logged commands with horizontal lines composed of hyphens (-----...). If this is not the first action recorded in the log, you can easily locate the most recent action; it follows the final hyphen-line.

7. In the script, identify the values that you used with the filter (135, 3 and 100), then copy the JavaScript code from `ScriptListenerJS.log` to another file and substitute the filter specification values with variable names.

   In the following example, `135` has been replaced with `angle`; `3` has been replaced with `height`; `100` has been replaced with `amount`.

```
var id19 = charIDToTypeID( "Embs" );
   var desc4 = new ActionDescriptor();
   var id20 = charIDToTypeID( "Angl" );
   desc4.putInteger( id20, angle );
   var id21 = charIDToTypeID( "Hght" );
   desc4.putInteger( id21, height );
   var id22 = charIDToTypeID( "Amnt" );
   desc7.putInteger( id22, amount );
   executeAction( id19, desc4 );
```

8. Wrap the code in a JavaScript function. In the following example, the function name is `emboss`.

```
function emboss( angle, height, amount )
{
   var id19 = charIDToTypeID( "Embs" );
   var desc4 = new ActionDescriptor();
   var id20 = charIDToTypeID( "Angl" );
   desc4.putInteger( id20, angle );
   var id21 = charIDToTypeID( "Hght" );
   desc4.putInteger( id21, height );
   var id22 = charIDToTypeID( "Amnt" );
   desc7.putInteger( id22, amount );
   executeAction( id19, desc4 );
}
```

9. To use a JavaScript to apply the Emboss filter to a document, include the emboss function in the JavaScript and call the function with the desired parameters. For example, the following example applies the Emboss filter with angle 75, height 2, and amount 89.

```
// Open the document in the script
//Call emboss with desired parameters
emboss( 75, 2, 89 );
//finish the script

//include the function in the script file
```

```
function emboss(angle, height, amount )
{
   var id32 = charIDToTypeID( "Embs" );
   var desc7 = new ActionDescriptor();
   var id33 = charIDToTypeID( "Angl" );
   desc7.putInteger( id33, angle );
   var id34 = charIDToTypeID( "Hght" );
   desc7.putInteger( id34, height );
   var id35 = charIDToTypeID( "Amnt" );
   desc7.putInteger( id35, amount );
   executeAction( id32, desc7 );
}
```

4 Using ScriptUI

Overview

ScriptUI is a component that works with the ExtendScript JavaScript interpreter to provide JavaScript programs with the ability to create and interact with user interface elements. It provides an object model for windows and UI control elements within an Adobe Creative Suite 2 application. ScriptUI objects are available to JavaScript scripts for the following applications:

- Adobe Photoshop CS2
- Adobe Bridge CS2

Note: Adobe GoLive CS SDK includes another version of these objects, which have diverged somewhat in usage and functionality. See the *Adobe GoLive CS SDK Programmer's Guide* and *Adobe GoLive CS SDK Programmer's Reference* for details.

This chapter describe how to work with these objects, and Chapter 5, "ScriptUI Object Reference," provides the details of the objects with their properties, methods, and creation parameters.

ScriptUI Programming Model

ScriptUI defines `Window` objects that represent platform-specific windows, and various control elements such as `Button` and `StaticText`, that represent user-interface controls. These objects share a common set of properties and methods that allow you to query the type, move the element around, set the title, caption or content, and so on. Many element types also have properties unique to that class of elements.

Creating a window

ScriptUI defines the following types of windows:

- Modal dialog boxes: not resizable, holds focus when shown.
- Main windows: resizable, suitable for use as an application's main window. (Main windows are not normally created by script developers for Adobe Creative Suite 2 applications.)

To create a new window, use the `Window` constructor function. The constructor takes the desired type of the window. The type is `"dialog"` for a modal dialog. You can supply optional arguments to specify an initial window title and bounds.

The following example creates an empty dialog with the variable name `dlg`, which is used in subsequent examples:

```
// Create an empty dialog window near the upper left of the screen
var dlg = new Window('dialog', 'Alert Box Builder', [100,100,480,490]);
```

Newly created windows are initially hidden; the `show` method makes them visible and responsive to user interaction. For example:

```
dlg.show();
```

Container elements

All `Windows` are containers—that is, they contain other elements within their bounds. Within a `Window`, you can create other types of container elements: `Panels` and `Groups`. These can contain control elements, and can also contain other `Panel` and `Group` containers. However, a `Window` cannot be added to any container.

- A `Group` is the simplest container used to visually organize related controls. You would typically define a group and populate it with related elements, for instance an `edittext` box and its descriptive `statictext` label.
- A `Panel` is a frame object, also typically used to visually organize related controls. It has a text property to specify a title, and can have a border to visually separate the collection of elements from other elements of a dialog.

You might create a `Panel` and populate it with several `Groups`, each with their own elements. You can create nested containers, with different layout properties for different containers, in order to define a relatively complex layout without any explicit placement.

You can add elements to any container using the `add` method (see Adding elements to containers). An element added to a container is considered a child of that container. Certain operations on a container apply to its children; for example, when you hide a container, its children are also hidden.

Window layout

When a script creates a `Window` and adds various UI elements to it, the locations and sizes of elements and spacing between elements is known as the *layout* of the window. Each UI element has properties which define its location and dimensions: `location`, `size`, and `bounds`. These properties are initially undefined, and a script that employs Automatic Layout should leave them undefined for the main window as well as its contained elements, allowing the automatic layout mechanism to set their values.

Your script can access these values , and (if not using auto-layout) set them as follows:

- The `location` of a window is defined by a Point object containing a pair of coordinates (`x` and `y`) for the top left corner (the *origin*), specified in the screen coordinate system. The `location` of an element within a window or other container is defined as the origin point specified in the container's coordinate system. That is, the `x` and `y` values are relative to the origin of the container.

  The following examples show equivalent ways of placing the content region of an existing window at screen coordinates [10, 50]:

  ```
  win.location = [10, 50];
  win.location = {x:10, y:50};
  win.location = "x:10, y:50";
  ```

- The `size` of an element's region is defined by a Dimension object containing a `width` and `height` in pixels.

  The following examples show equivalent ways of changing an existing window's width and height to 200 and 100:

  ```
  win.size = [200, 100];
  win.size = {width:200, height:100};
  win.size = "width:200, height:100";
  ```

  This example shows how to change a window's height to 100, leaving its location and width unchanged:

  ```
  win.size.height = 100;
  ```

- The `bounds` of an element are defined by a Bounds object containing both the origin point (`x`, `y`) and size (`width`, `height`) To define the size and location of windows and controls in one step, use the `bounds` property.

  The value of the `bounds` property can be a string with appropriate contents, an inline JavaScript `Bounds` object, or a four-element array. The following examples show equivalent ways of placing a 380 by 390 pixel window near the upper left corner of the screen:

```
var dlg = new Window('dialog', 'Alert Box Builder', [100,100,480,490]);
dlg.bounds = [100,100,480,490];
dlg.bounds = {x:100, y:100, width:380, height:390};
dlg.bounds = {left:100, top:100, right:480, bottom:490};
dlg.bounds = "left:100, top:100, right:480, bottom:490";
```

The `window` dimensions define the size of the *content region* of the window, or that portion of the window that a script can directly control. The actual window size is typically larger, because the host platform's window system typically adds title bars and borders. The `bounds` property for a `Window` refers only to its content region. To determine the bounds of the frame surrounding the content region of a window, use the Window Object's frameBounds property.

Adding elements to containers

To add elements to a `window`, `panel`, or `group`, use the container's add method. This method accepts the `type` of the element to be created and some optional parameters, depending on the element type. It creates and returns an object of the specified type.

In additions to windows, ScriptUI defines the following user-interface elements and controls:

- Panels (frames) and groups, to collect and organize other control types
- Push buttons with text or icons, radio buttons, checkbox buttons
- Static text or images, edit text
- Progressbars, scrollbars, sliders
- Lists, which include list boxes and drop-down (also called popup) lists. Each item in a list is a control of type `item`, and the parent list's `items` property contains an array of child items. You can add list items with the parent list's add method.

You can specify the initial size and position of any new element relative to the working area of the parent container, in an optional `bounds` parameter. Different types of elements have different additional parameters. For elements which display text, for example, you can specify the initial text. See the ScriptUI Object Reference for details.

The order of optional parameters must be maintained. Use the value `undefined` for a parameter you do not wish to set. For example, if you want to use automatic layout to determine the bounds, but still set the title and text in a panel and button, the following creates `Panel` and `Button` elements with an initial `text` value, but no `bounds` value:

```
dlg.btnPnl = dlg.add('panel', undefined, 'Build it');
dlg.btnPnl.testBtn = dlg.btnPnl.add('button', undefined, 'Test');
```

Tip: This example creates a dynamic property, `btnPnl`, on the parent window object, which contains the returned reference to the child control object. This is not required, but provides a useful way to access your controls.

A new element is initially set to be visible, but it not shown unless its parent object is shown.

Creation properties

Some element types have attributes that can only be specified when the element is created. These are not normal properties of the element, in that they cannot be changed during the element's lifetime, and they are only needed once. For these element types, you can supply an optional *creation-properties* argument to the `add` method. This argument is an object with one or more properties that control aspects of the element's appearance, or special functions such as whether an edit text element is editable or read-only. See Control object constructors for details.

All UI elements have an optional creation property called `name`, which assigns a name for identifying that element. For example, the following creates a new `Button` element with the name 'ok':

```
dlg.btnPnl.buildBtn =
   dlg.btnPnl.add('button', undefined, 'Build', {name:'ok'});
```

Note: In Photoshop CS, panel coordinates were measured from outside the frame (including the title bar), but in Photoshop CS2, panel coordinates are measured from the inside the frame (the content area). This means that if you use the same values to set the vertical positions of child controls in a panel, the positions are slightly different in the two versions. When you add a panel to a window, you can choose to set a creation property (`su1PanelCoordinates`), which causes that panel to automatically adjust the positions of its children; see the add method for panel. When automatic adjustment is enabled, you provide position values that were correct for Photoshop CS, and the result is the same in Photoshop CS2. You can also set automatic adjustment for a window; in this case, it applies to all child panels of that window unless it is explicitly disabled in the child panel. See Window object constructor.

Accessing child elements

A reference to each element added to a container is appended to the container's `children` property. You can access the child elements through this array, using a 0-based index. For controls that are not containers, the `children` collection is empty.

In this example, the `msgPnl` panel was the first element created in `dlg`, so the script can access the panel object at index 0 of the parent's `children` property to set the the text for the title:

```
var dlg = new Window('dialog', 'Alert Box Builder');
dlg.msgPnl = dlg.add('panel');
dlg.children[0].text = 'Messages';
```

If you use a creation property to assign a name to a newly created element, you can access that child by its name, either in the `children` array of its parent, or directly as a property of its parent. For example, the `Button` in a previous example was named "`ok`", so it can be referenced as follows:

```
dlg.btnPnl.children['ok'].text = "Build";
dlg.btnPnl.ok.text = "Build";
```

For list controls (type `list` and `dropdown`), you can access the child list-item objects through the `items` array.

Removing elements

To add elements to a `window`, `panel`, or `group`, use the container's remove method. This method accepts an object representing the element to be removed, or the name of the element, or the index of the element in the container's `children` collection (see Accessing child elements).

The specified element is removed from view if it was currently visible, and it is no longer accessible from the container or window. The results of any further references by a script to the object representing the element are undefined.

To remove list items from a list, use the parent list control's remove method in the same way. It removes the item from the parent's `items` list, hides it from view, and deletes the item object.

Types of controls

The following sections introduce the types of controls you can add to a `Window` or other container element (`panel` or `group`). For details of the properties and functions, and of how to create each type of element, see ScriptUI Object Reference.

Containers

These are types of Control Objects which are contained in windows, and which contain and group other controls.

`Panel`	Typically used to visually organize related controls. • Set the `text` property to define a title which appears at the top of the `Panel`. • An optional `borderStyle` creation property controls the appearance of the border drawn around the panel. You can use `Panels` as separators: those with `width = 0` appear as vertical lines and those with `height = 0` appear as horizontal lines. `var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);` **`dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');`**
`Group`	Used to visually organize related controls. Unlike `Panels`, `Groups` have no title or visible border. You can use them to create hierarchies of controls, and for fine control over layout attributes of certain groups of controls within a larger panel. For examples, see Creating more complex arrangements.

User interface controls

These are types of Control Objects which are contained in windows, panels, and groups, and which provide specific kinds of display and user interaction.

StaticText

Typically used to display text strings that are not intended for direct manipulation by a user, such as informative messages or labels.

This example creates a `Panel` and adds several `StaticText` elements:

```
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');
dlg.msgPnl.titleSt = dlg.msgPnl.add('statictext', [15,15,105,35],
  'Alert box title:');
dlg.msgPnl.msgSt = dlg.msgPnl.add('statictext', [15,65,105,85],
  'Alert message:');
dlg.show();
```

EditText

Allows users to enter text, which is returned to the script when the dialog is dismissed. Text in `EditText` elements can be selected, copied, and pasted.

- Set the `text` property to assign the initial displayed text in the element, and read it to obtain the current text value, as entered or modified by the user.
- Set the `textselection` property to replace the current selection with new text, or to insert text at the cursor (insertion point). Read this property to obtain the current selection, if any.

This example adds some `EditText` elements, with initial values that a user can accept or replace:

```
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.msgPnl = dlg.add('panel', [25,15,355,130], 'Messages');
dlg.msgPnl.titleSt = dlg.msgPnl.add('statictext', [15,15,105,35],
  'Alert box title:');
dlg.msgPnl.titleEt = dlg.msgPnl.add('edittext', [115,15,315,35],
  'Sample Alert');
dlg.msgPnl.msgSt = dlg.msgPnl.add('statictext', [15,65,105,85],
  'Alert message:');
dlg.msgPnl.msgEt = dlg.msgPnl.add('edittext', [115,45,315,105],
  '<your message here>', {multiline:true});
dlg.show();
```

Note the creation property on the second `EditText` field, where `multiline:true` indicates a field in which a long text string can be entered. The text wraps to appear as multiple lines.

Button

Typically used to initiate some action from a window when a user clicks the button; for example, accepting a dialog's current settings, canceling a dialog, bringing up a new dialog, and so on.

- Set the `text` property to assign a label to identify a `Button`'s function.
- The `onClick` callback method provides behavior.

```
var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);
dlg.btnPnl = dlg.add('panel', [15,50,365,95], 'Build it');
dlg.btnPnl.testBtn = dlg.btnPnl.add('button', [15,15,115,35], 'Test');
dlg.btnPnl.buildBtn = dlg.btnPnl.add('button', [125,15,225,35],
  'Build', {name:'ok'});
dlg.btnPnl.cancelBtn = dlg.btnPnl.add('button', [235,15,335,35],
  'Cancel', {name:'cancel'});
dlg.show();
```

IconButton

A button that displays an icon instead of text. Like a text button, typically initiates an action in response to a click.

- The `icon` property identifies the icon image; see Displaying icons.
- The `onClick` callback method provides behavior.

Image	Displays an iconic image. • The icon property identifies the icon image; see Displaying icons.

Checkbox	Allows the user to set a boolean state.
	• Set the text property to assign an identifying text string that appears next to the clickable box.
	• The user can click to select or deselect the box, which shows a checkmark when selected. The value=true when it is selected (checked) and false when it is not.
	When you create a Checkbox, you can set its value property to specify its initial state and appearance.
	`// Add a checkbox to control the buttons that dismiss an alert box`
	`dlg.hasBtnsCb = dlg.add('checkbox', [125,145,255,165],`
	`'Should there be alert buttons?');`
	`dlg.hasBtnsCb.value = true;`

RadioButton	Allows the user to select one choice among several.
	• Set the text property to assign an identifying text string that appears next to the clickable button.
	• The value=true when the button is selected. The button shows the state in a platform-specific manner, with a filled or empty dot, for example.
	You group a related set of radio buttons by creating all the related elements one after another. When any button's value becomes true, the value of all other buttons in the group becomes false. When you create a group of radio buttons, you should set the state of one of them true:
	`var dlg = new Window('dialog', 'Alert Box Builder',[100,100,480,245]);`
	`dlg.alertBtnsPnl = dlg.add('panel', [45,50,335,95], 'Button alignment');`
	`dlg.alertBtnsPnl.alignLeftRb = dlg.alertBtnsPnl.add('radiobutton',`
	`[15,15,95,35], 'Left');`
	`dlg.alertBtnsPnl.alignCenterRb = dlg.alertBtnsPnl.add('radiobutton',`
	`[105,15,185,35], 'Center');`
	`dlg.alertBtnsPnl.alignRightRb = dlg.alertBtnsPnl.add('radiobutton',`
	`[195,15,275,35], 'Right');`
	`dlg.alertBtnsPnl.alignCenterRb.value = true;`
	`dlg.show();`

Progressbar	Typically used to display the progress of a time-consuming operation. A colored bar covers a percentage of the area of the control, representing the percentage completion of the operation. The value property reflects and controls how much of the visible area is colored, relative to the maximum value (maxvalue). By default the range is 0 to 100, so the value=50 when the operation is half done.
Slider	Typically used to select within a range of values. The slider is a horizontal bar with a draggable indicator, and you can click a point on the slider bar to jump the indicator to that location. The value property reflects and controls the position of the indicator, within the range determined by minvalue and maxvalue. By default the range is 0 to 100, so setting value=50 moves the indicator to the middle of the bar.

Scrollbar	Like a slider, the scrollbar is a bar with a draggable indicator. It also has "stepper" buttons at each end, that you can click to jump the indicator by the amount in the `stepdelta` property. If you click a point on the bar outside the indicator, the indicator jumps by the amount in the `jumpdelta` property.
	You can create scrollbars with horizontal or vertical orientation; if `width` is greater than `height`, it is horizontal, otherwise it is vertical.
	Scrollbars are often created with an associated `EditText` field to display the current value of the scrollbar, and to allow setting the scrollbar's position to a specific value. This example creates a scrollbar with associated `StaticText` and `EditText` elements within a panel:
	`dlg.sizePnl = dlg.add('panel', [60,240,320,315], 'Dimensions');`
	`dlg.sizePnl.widthSt = dlg.sizePnl.add('statictext', [15,15,65,35], 'Width:');`
	`dlg.sizePnl.widthScrl = dlg.sizePnl.add('scrollbar', [75,15,195,35], 300, 300, 800);`
	`dlg.sizePnl.widthEt = dlg.sizePnl.add('edittext', [205,15,245,35]);`
	The last three arguments to the `add` method that creates the scrollbar define the values for the `value`, `minvalue` and `maxvalue` properties.

ListBox **DropDownList**	These controls display lists of items, which are represented by `ListItem` objects in the `items` property. You can access the items in this array using a 0-based index. • A `ListBox` control displays a list of choices. When you create the object, you specify whether it allows the user to select only one or multiple items. If a list contains more items than can be displayed in the available area, a scrollbar may appear that allows the user to scroll through all the list items. • A `DropDownList` control displays a single visible item. When you click the control, a list drops down and allows you to select one of the other items in the list. Drop-down lists can have nonselectable separator items for visually separating groups of related items, as in a menu. You can specify the choice items on creation of the list object, or afterward using the list object's add method. You can remove items programmatically with the list object's remove and removeAll method.
ListItem	Items added to or inserted into any type of list control are `ListItem` objects, with properties that can be manipulated from a script. `ListItem` elements can be of the following types: • `item`: the typical item in any type of list. It displays text or an icon, and can be selected. To display an icon, set the item object's `icon` property; see Displaying icons. • `separator`: a separator is a nonselectable visual element in adrop-down list. Although it has a `text` property, the value is ignored, and the item is displayed as a horizontal line.

Displaying icons

You can display icon images in Image or IconButton controls, or in place of strings as the selectable items in a Listbox or DropdownList control. In each case, the image is defined by setting the element's `icon` property, either to a named icon resource, a File Object, or the pathname of a file containing the iconic image (see Specifying Paths).

The image data for an icon must be in Portable Network Graphics (PNG) format. See http://www.libpng.org for detailed information on the PNG format.

You can set or reset the `icon` property at any time to change the image displayed in the element.

The scripting environment can define icon *resources*, which are available to scripts by name. To specify an icon resource, set a control's `icon` property to the resource's JavaScript name, or refer to the resource by name when creating the control. For example, to create a button with an application-defined icon resource:

```
myWin.upBtn = myWin.add ("iconbutton", undefined, "SourceFolderIcon");
```

Photoshop CS2 defines these icon resources:

```
Step1Icon
Step2Icon
Step3Icon
Step4Icon
SourceFolderIcon
DestinationFolderIcon
```

If a script does not explicitly set the `preferredSize` or `size` property of an element that displays a icon image, the value of `preferredSize` is determined by the dimensions of the iconic image. If the size values are explicitly set to dimensions smaller than those of the actual image graphic, the displayed image is clipped. If they are set to dimensions larger than those of the image graphic, the displayed image is centered in the larger space. An image is never scaled to fit the available space.

Prompts and alerts

Static functions on the Window Class are globally available to display short messages in standard dialogs. The host application controls the appearance of these simple dialogs, so they are consistent with other alert and message boxes displayed by the application. You can often use these standard dialogs for simple interactions with your users, rather than designing special-purpose dialogs of your own.

Use the static functions alert, confirm, and prompt on the `Window` class to invoke these dialogs with your own messages. You do not need to create a `window` object to call these functions.

Modal dialogs

A modal dialog is initially invisible. Your script invokes it using the show method, which does not return until the dialog has been dismissed. The user can dismiss it by using a platform-specific window gesture, or by using one of the dialog controls that you supply, typically an **OK** or **Cancel** button. The onClick method of such a button must call the close or hide method to close the dialog. The `close` method allows you to pass a value to be returned by the `show` method.

For an example of how to define such buttons and their behavior, see Defining Behavior for Controls with Event Callbacks.

Creating and using modal dialogs

A dialog typically contains some controls that the user must interact with, to make selections or enter values that your script will use. In some cases, the result of the user action is stored in the object, and you can retrieve it after the dialog has been dismissed. For example, if the user changes the state of a `Checkbox` or `RadioButton`, the new state is found in the control's `value` property.

However, if you need to respond to a user action while the dialog is still active, you must assign the control a callback function for the interaction event, either onClick or onChange. The callback function is the value of the `onClick` or `onChange` property of the control.

For example, if you need to validate a value that the user enters in a `edittext` control, you can do so in an `onChange` callback handler function for that control. The callback can perform the validation, and perhaps display an alert to inform the user of errors.

Sometimes, a modal dialog presents choices to the user that must be correct before your script allows the dialog to be dismissed. If your script needs to validate the state of a dialog after the user clicks **OK**, you can define an onClose event handler for the dialog. This callback function is invoked whenever a window is closed. If the function returns `true`, the window is closed, but if it returns `false`, the close operation is cancelled and the window remains open.

Your `onClose` handler can examine the states of any controls in the dialog to determine their correctness, and can show alert messages or use other modal dialogs to alert the user to any errors that must be corrected. It can then return `true` to allow the dialog to be dismissed, or `false` to allow the user to correct any errors.

Dismissing a modal dialog

Every modal dialog should have at least one button that the user can click to dismiss the dialog. Typically modal dialogs have an **OK** and a **Cancel** button to close the dialog with or without accepting changes that were made in it.

You can define onClick callbacks for the buttons that close the parent dialog by calling its close method. You have the option of sending a value to the `close` method, which is in turn passed on to and returned from the show method that invoked the dialog. This return value allows your script to distinguish different closing events; for example, clicking **OK** can return 1, clicking **Cancel** can return 2. However, for this typical behavior, you do not need to define these callbacks explicitly; see Default and cancel elements below.

For some dialogs, such as a simple alert with only an **OK** button, you do not need to return any value. For more complex dialogs with several possible user actions, you might need to distinguish more outcomes. If you need to distinguish more than two closing states, you must define your own closing callbacks rather than relying on the default behavior.

If, by mistake, you create a modal dialog with no buttons to dismiss it, or if your dialog does have buttons, but their `onClick` handlers do not function properly, a user can still dismiss the dialog by typing ESC. In this case, the system will execute a call to the dialog's `close` method, passing a value of 2. This is not, of course, a recommended way to design your dialogs, but is provided as an escape hatch to prevent the application from hanging in case of an error in the operations of your dialog.

Default and cancel elements

The user can typically dismiss a modal dialog by clicking an **OK** or **Cancel** button, or by typing certain keyboard shortcuts. By convention, typing ENTER is the same as clicking **OK** or the default button, and typing ESC is the same as clicking **Cancel**. The keyboard shortcut has the same effect as calling notify for the associated `button` control.

To determine which control is notified by which keyboard shortcut, set the `dialog` object's defaultElement and cancelElement properties. The value is the control object that should be notified when the user types the associated keyboard shortcut.

- For buttons assigned as the `defaultElement`, if there is no `onClick` handler associated with the button, clicking the button or typing ENTER calls the parent dialog's close method, passing a value of 1 to be returned by the show call that opened the dialog.
- For buttons assigned as the `cancelElement`, if there is no `onClick` handler associated with the button, clicking the button or typing ESC calls the parent dialog's close method, passing a value of 2 to be returned by the show call that opened the dialog.

If you do not set the `defaultElement` and `cancelElement` properties explicitly, ScriptUI tries to choose reasonable defaults when the dialog is about to be shown for the first time. For the default element, it looks for a button whose `name` or `text` value is "`ok`" (disregarding case). For the cancel element, it looks for a button whose `name` or `text` value is "`cancel`" (disregarding case). Because it looks at the `name` value first, this works even if the `text` value is localized. If there is no suitable button in the dialog, the property value remains `null`, which means that the keyboard shortcut has no effect in that dialog.

To make this feature most useful, it is recommended that you always provide the `name` creation property for buttons meant to be used in this way.

Resource Specifications

You can create one or more UI elements at a time using a *resource specification*. This specially formatted string provides a simple and compact means of creating an element, including any container element and its component elements. The resource-specification string is passed as the `type` parameter to the `Window()` or `add()` constructor function.

The general structure of a resource specification is an element type specification (such as `dialog`), followed by a set of braces enclosing one or more property definitions.

```
var myResource = "dialog{ control_specs }";
var myDialog = new Window ( myResource );
```

Controls are defined as properties within windows and other containers. For each control, give the class name of the control, followed by the properties of the control enclosed in braces. For example, the following specifies a `Button`:

```
testBtn: Button { text: 'Test' }
```

The following resource string specifies a panel that contains several `StaticText` and `EditText` controls:

```
"msgPnl: Panel { text: 'Messages', bounds:[25,15,355,130], \
   titleSt: StaticText { text:'Alert box title:', \
      bounds:[15,15,105,35] }, \
   titleEt: EditText { text:'Sample Alert', bounds:[115,15,315,35] }, \
   msgSt: StaticText { text:'Alert message:', \
      bounds:[15,65,105,85] }, \
   msgEt: EditText { text:'<your message here>', \
      bounds:[115,45,315,105], properties:{multiline:true} } \
}"
```

The property with name `properties` specifies creation properties; see Creation properties.

A property value can be specified as `null`, `true`, `false`, a string, a number, an inline array, or an object.

- An inline array contains one or more values in the form:

  ```
  [value, value,...]
  ```

- An object can be an inline object, or a named object, in the form :

  ```
  {classname inlineObject}
  ```

- An inline object contains one or more properties, in the form:

  ```
  {propertyName:propertyValue,propertyName:propertyValue,... }
  ```

The Resource specification example shows how to build a complete window and all its contents with a resource specificaiton. The resource specification format can also be used to create a single element or container and its child elements. For example, if the `alertBuilderResource` in Resource specification example did not contain the panel `btnPnlResource`, you could define that resource separately, then add it to the dialog as follows:

```
var btnPnlResource =
   "panel { text: 'Build it', bounds:[15,330,365,375], \
      testBtn: Button { text:'Test', bounds:[15,15,115,35] }, \
      buildBtn: Button { text:'Build', bounds:[125,15,225,35], \
      properties:{name:'ok'} }, \
      cancelBtn: Button { text:'Cancel', bounds:[235,15,335,35], \
      properties:{name:'cancel'} } \
   }";
dlg = new Window(alertBuilderResource);
dlg.btnPnl = dlg.add(btnPnlResource);
dlg.show();
```

Defining Behavior for Controls with Event Callbacks

You must define the behavior of your controls in order for them to respond to user interaction. You do this by defining event-handling callback functions as part of the definition of the control or window. To respond to a specific event, define a handler function for it, and assign a reference to that function in the corresponding property of the window or control object. Different types of windows and controls respond to different actions, or events:

- Windows generate events when the user moves or resizes the window. To handle these events, define callback functions for onMove, onMoving, onResize, and onResizing. To respond to the user opening or closing the window, define callback functions for onShow and onClose.
- Button, radiobutton, and checkbox controls generate events when the user clicks within the control bounds. To handle the event, define a callback function for onClick.
- Edittext, scrollbar, and slider controls generate events when the content or value changes—that is, when the user types into an edit field, or moves the scroll or slider indicator. To handle these events, define callback functions for onChange and onChanging.

Defining event handler functions

Your script can define an event handler as a named function referenced by the callback property, or as an unnamed function defined inline in the callback property.

- If you define a named function, assign its name as the value of the corresponding callback property. For example:

```
function hasBtnsCbOnClick { /* do something interesting */ }
hasBtnsCb.onClick = hasBtnsCbOnClick;
```

- For a simple, unnamed function, set the property value directly to the function definition:

```
UI_element.callback_name = function () { handler_definition};
```

Event-handler functions take no arguments.

For example, the following sets the `onClick` property of the checkbox `hasBtnsCb`, to a function that enables another control in the same dialog:

```
hasBtnsCb.onClick = function ()
   { this.parent.alertBtnsPnl.enabled = this.value; };
```

The following statements set the `onClick` event handlers for buttons that close the containing dialog, returning different values to the `show` method that invoked the dialog, so that the calling script can tell which button was clicked:

```
buildBtn.onClick = function () { this.parent.parent.close(1); };
cancelBtn.onClick = function () { this.parent.parent.close(2); };
```

Simulating user events

You can simulate user actions by sending an event notification directly to a window or control with the `notify` method. A script can use this method to generate events in the controls of a window, as if a user was clicking buttons, entering text, or moving the window. If you have defined an event-handler callback for the element, the `notify` method invokes it.

The `notify` method takes an optional argument that specifies which event it should simulate. If a control can generate only one kind of event, notification generates that event by default.

The following controls generate the `onClick` event:

```
button
checkbox
iconbutton
radiobutton
```

The following controls generate the `onChange` event:

```
dropdownlist
edittext
listbox
scrollbar
slider
```

The following controls generate the `onChanging` event:

```
edittext
scrollbar
slider
```

In `radiobutton` and `checkbox` controls, the boolean `value` property automatically changes when the user clicks the control. If you use `notify()` to simulate a click, the `value` changes just as if the user had clicked. For example, if the `value` of a checkbox `hasBtnsCb` is `true`, this code changes the value to `false`:

```
if (dlg.hasBtnsCb.value == true) dlg.hasBtnsCb.notify();
// dlg.hasBtnsCb.value is now false
```

Automatic Layout

When a script creates a window and its associated UI elements, it can explicitly control the size and location of each element and of the container elements, or it can take advantage of the automatic layout capability provided by ScriptUI. The automatic layout mechanism uses certain available information about UI elements, along with a set of layout rules, to establish a visually pleasing layout of the controls in a dialog, automatically determining the proper sizes for elements and containers.

Automatic layout is easier to program than explicit layout. It makes a script easier to modify and maintain, and it also makes the script easier to localize for different languages.

The script programmer has considerable control over the automatic layout process. Each container has an associated layout manager object, specified in the `layout` property. The layout manager controls the sizes and positions of the contained elements, and also sizes the container itself.

There is a default layout manager object, or you can create a new one:

```
myWin.layout = new AutoLayoutManager(myWin);
```

Default layout behavior

By default, the `autoLayoutManager` object implements the default layout behavior. A script can modify the properties of the default layout manager object, or create a new, custom layout manager if it needs more specialized layout behavior. See Custom layout manager example.

Child elements of a container can be organized in a single row or column, or in a stack, where the elements overlap one other in the same region of the container, and only the top element is fully visible. This is controlled by the container's `orientation` property, which can have the value `row`, `column`, or `stack`.

You can nest `Panel` and `Group` containers to create more complex organizations. For example, to display two columns of controls, you can create a panel with a row orientation that in turn contains two groups, each with a column orientation.

Containers have properties to control inter-element spacing and margins within their edges. The layout manager provides defaults if these are not set.

The alignment of child elements within a container is controlled by the `alignChildren` property of the container, and the `alignment`property of the individual controls. The `alignChildren` property determines an overall strategy for the container, which can be overridden by a particular child element's `alignment` value.

A layout manager can determine the best size for a child element through the element's `preferredSize` property. The value defaults to dimensions determined by the UI framework based on characteristics of the control type and variable characteristics such as a displayed text string.

For details of how you can set these property values to affect the automatic layout, see Automatic layout properties.

Note: ScriptUI does not offer direct control of fonts, and fonts are chosen differently on different platforms, so windows that are created the same way can appear different on different platforms.

Automatic layout properties

Your script establishes rules for the layout manager by setting the values of certain properties, both in the container object and in the child elements. The following examples show the effects of various combinations of values for these properties. The examples are based on a simple window containing a `StaticText`, `Button` and `EditText` element, created (using Resource Specifications) as follows:

```
var w = new Window(
   "window { \
      orientation: 'row', \
      st: StaticText { }, \
      pb: Button { text: 'OK' }, \
      et: EditText { size:[20, 30] } \
   }");
w.show();
```

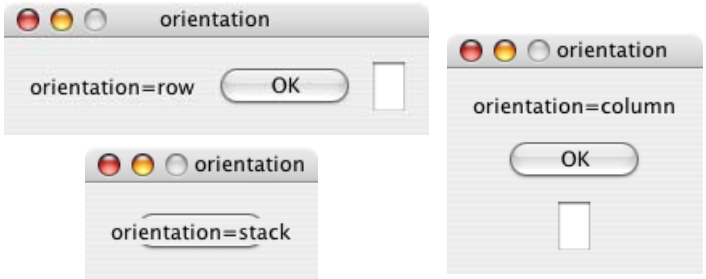
Each example shows the effects of setting particular layout properties in various ways. In each window, `w.text` is set so that the window title shows which property is being varied, and `w.st.text` is set to display the particular property value being demonstrated.

Container orientation

The `orientation` property of a container specifies the organization of child elements within it. It can have these values:

- `row`: Child elements are arranged next to each other, in a single row from left to right across the container. The height of the container is based on the height of the tallest child element in the row, and the width of the container is based on the combined widths of all the child elements.
- `column`: Child elements are arranged above and below each other, in a single column from top to bottom across the container. The height of the container is based on the combined heights of all the child elements, and the width of the container is based on the widest child element in the column.
- `stack`: Child elements are arranged overlapping one another, as in a stack of papers. The elements overlie one another in the same region of the container. Only the top element is fully visible. The height of the container is based on the height of the tallest child element in the stack, and the width of the container is based on the widest child element in the stack.

The following figure shows the results of laying out the sample window with each of these orientations:



Aligning children

The alignment of child elements within a container is controlled by two properties: `alignChildren` in the parent container, and `alignment` in each child. The `alignChildren` value in the parent container controls the alignment of all children within that container, unless it is overridden by the `alignment` value set on an individual child element.

These properties use the same values, which specify alignment along one axis, depending on the orientation of the container. The property values are not case-sensitive; for example, the strings `FILL`, `Fill`, and `fill` are all valid.

Elements in a row can be aligned along the vertical axis, in these ways:

- `top`: The element's top edge is located at the top margin of its container.
- `bottom`: The element's bottom edge is located at the bottom margin of its container.
- `center`: The element is centered within the top and bottom margins of its container.
- `fill`: The element's height is adjusted to fill the height of the container between the top and bottom margins.

Elements in a column can be aligned along the horizontal axis, in these ways:

- `left`: The element's left edge is located at the left margin of its container.
- `right`: The element's right edge is located at the right margin of its container.
- `center`: The element is centered within the right and left margins of its container.
- `fill`: The element's width is adjusted to fill the width of the container between the right and left margins.

Elements in a stack can be aligned along either the vertical or the horizontal axis, in these ways:

- `top`: The element's top edge is located at the top margin of its container, and the element is centered within the right and left margins of its container.
- `bottom`: The element's bottom edge is located at the bottom margin of its container, and the element is centered within the right and left margins of its container.
- `left`: The element's left edge is located at the left margin of its container, and the element is centered within the top and bottom margins of its container.
- `right`: The element's right edge is located at the right margin of its container, and the element is centered within the top and bottom margins of its container.
- `center`: The element is centered within the top, bottom, right and left margins of its container.
- `fill`: The element's height is adjusted to fill the height of the container between the top and bottom margins., and the element's width is adjusted to fill the width of the container between the right and left margins.

The following figure shows the results of creating the sample window with row orientation and the `bottom` and `top` alignment settings in the parent's `alignChildren` property:

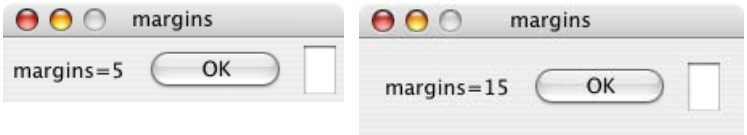
The following figure shows the results of creating the sample window with column orientation and the `right`, `left`, and `fill` alignment settings in the parent's `alignChildren` property. Notice how in the `fill` case, each element is made as wide as the widest element in the container:

You can override the container's child alignment, as specified by `alignChildren`, by setting the `alignment` property of a particular child element. The following diagram shows the result of setting `alignment` to `right` for the `EditText` element, when the parent's `alignChildren` value is left:

Setting margins

The `margins` property of a container specifies the number of pixels between the edges of a container and the outermost edges of the child elements. You can set this property to a simple number to specify equal margins, or using a Margins object, which allows you to specify different margins for each edge of the container.

The following figure shows the results of creating the sample window with row orientation and margins of 5 and 15 pixels:



This figure shows the results of creating the sample window with column orientation, a top margin of 0 pixels, a bottom margin of 20 pixels, and left and right margins of 15 pixels:

Spacing between children

The `spacing` property of a container specifies the number of pixels separating one child element from its adjacent sibling element.

This figure shows the results of creating the sample window with row orientation, and spacing of 15 and 5 pixels, respectively:

This figure shows the results of creating the sample window with column orientation, and spacing of 20 pixels:

Determining a preferred size

Each element has a `preferredSize` property, which is initially defined with reasonable default dimensions for the element. The default value is calculated by ScriptUI, and is based on constant characteristics of each type of element, and variable characteristics such as the text string to be displayed in a button or text element.

If an element's `size` property is not defined, the layout manager uses the value of `preferredSize` to determine the dimensions of each element during the layout process. Generally, you should avoid setting the `preferredSize` property explicitly, and let ScriptUI determine the best value based on the state of an element at layout time. This allows you to set the `text` properties of your UI elements using localizable strings (see Localization in ScriptUI Objects). The width and height of each element are calculated at layout time based on the chosen language-specific text string, rather than relying on the script to specify a fixed size for each element.

However, a script can explicitly set the `preferredSize` property to give hints to the layout manager about the intended sizes of elements for which a reasonable default size is not easily determined, such as an `EditText` element that has no initial text content to measure.

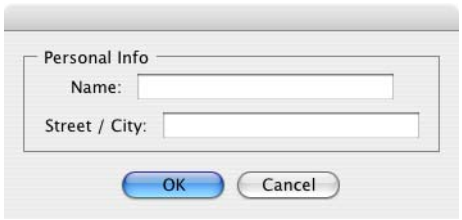
Creating more complex arrangements

You can easily create more complex arrangements by nesting `Group` containers within `Panel` containers and other `Group` containers.

Many dialogs consist of rows of information to be filled in, where each row has columns of related types of controls. For instance, an edit field is typically in a row next to a static text label that identifies it, and a series of such rows are arranged in a column. This example (created using Resource Specifications) shows a simple dialog in which a user can enter information into two `EditText` fields, each arranged in a row with

its StaticText label. To create the layout, a Panel with a column orientation contains two Group elements with row orientation. These groups contain the control rows. A third Group, outside the panel, contains the row of buttons.

```
res =
"dialog { \
   info: Panel { orientation: 'column', \
      text: 'Personal Info', \
      name: Group { orientation: 'row', \
         s: StaticText { text:'Name:' }, \
         e: EditText { preferredSize: [200, 20] } \
      }, \
      addr: Group { orientation: 'row', \
         s: StaticText { text:'Street / City:' }, \
         e: EditText { preferredSize: [200, 20] } \
      }  \
   }, \
   buttons: Group { orientation: 'row', \
      okBtn: Button { text:'OK', properties:{name:'ok'} }, \
      cancelBtn: Button { text:'Cancel', properties:{name:'cancel'} } \
   } \
}";
win = new Window (res);
win.center();
win.show();
```



In this simplest example, the columns are not vertically aligned. When you are using fixed-width controls in your rows, a simple way to get an attractive alignment of the StaticText labels for your EditText fields is to align the child rows in the Panel to the right of the panel. In the example, add the following to the Panel specification:

```
info: Panel { orientation: 'column', alignChildren:'right', \
```

This creates the following result:

Suppose now that you need two panels, and want each panel to have the same width in the dialog. You can specify this at the level of the dialog window object, the parent of both panels. Specify alignChildren='fill', which makes each child of the dialog match its width to the widest child.

```
res =
   "dialog { alignChildren: 'fill', \
      info: Panel { orientation: 'column', alignChildren:'right', \
         text: 'Personal Info', \
         name: Group { orientation: 'row', \
```

```
            s: StaticText { text:'Name:' }, \
            e: EditText { preferredSize: [200, 20] } \
        } \
    }, \
    workInfo: Panel { orientation: 'column', \
        text: 'Work Info', \
        name: Group { orientation: 'row', \
            s: StaticText { text:'Company name:' }, \
            e: EditText { preferredSize: [200, 20] } \
        } \
    }, \
    buttons: Group { orientation: 'row', alignment: 'right', \
        okBtn: Button { text:'OK', properties:{name:'ok'} }, \
        cancelBtn: Button { text:'Cancel', properties:{name:'cancel'} } \
    } \
}";
win = new Window (res); win.center(); win.show();
```

To make the buttons to appear at the right of the dialog, the `buttons` group overrides the `fill` alignment of its parent (the dialog), and specifies `alignment='right'`.

Creating dynamic content

Many dialogs need to present different sets of information based on the user selecting some option within the dialog. You can use the `stack` orientation to present different views in the same region of a dialog.

A `stack` orientation of a container places child elements so they are centered in a space which is wide enough to hold the widest child element, and tall enough to contain the tallest child element. If you arrange groups or panels in such a stack, you can show and hide them in different combinations to display a different set of controls in the same space, depending on other choices in the dialog.

For example, this dialog changes dynamically according to the user's choice in the `DropDownList`.

The following script creates this dialog. It compresses the "Personal Info" and "Work Info" panels from the previous example into a single `Panel` that has two `Groups` arranged in a stack. A `DropDownList` allows the user to choose which set of information to view. When the user makes a choice in the list, its onChange function shows one group, and hides the other.

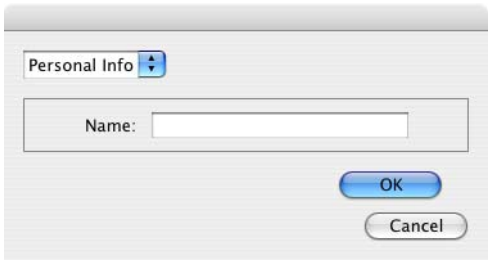
```
res =
    "dialog { \
        whichInfo: DropDownList { alignment:'left' }, \
```

```
        allGroups: Panel { orientation:'stack', \
            info: Group { orientation: 'column', \
                name: Group { orientation: 'row', \
                    s: StaticText { text:'Name:' }, \
                    e: EditText { preferredSize: [200, 20] } \
                } \
            }, \
            workInfo: Group { orientation: 'column', \
                name: Group { orientation: 'row', \
                    s: StaticText { text:'Company name:' }, \
                    e: EditText { preferredSize: [200, 20] } \
                } \
                }, \
        }, \
        buttons: Group { orientation: 'row', alignment: 'right', \
            okBtn: Button { text:'OK', properties:{name:'ok'} }, \
            cancelBtn: Button { text:'Cancel', properties:{name:'cancel'} } \
        } \
    }";
win = new Window (res);
win.whichInfo.onChange = function () {
    if (this.selection != null) {
        for (var g = 0; g < this.items.length; g++)
            this.items[g].group.visible = false; //hide all other groups
        this.selection.group.visible = true;//show this group
    }
}
var item = win.whichInfo.add ('item', 'Personal Info');
item.group = win.allGroups.info;
item = win.whichInfo.add ('item', 'Work Info');
item.group = win.allGroups.workInfo;
win.whichInfo.selection = win.whichInfo.items[0];
win.center();
win.show();
```

Custom layout manager example

This script creates a dialog almost identical to the one in the previous example, except that it defines a layout-manager subclass, and assigns an instance of this class as the `layout` property for the last `Group` in the dialog. (The example also demonstrates the technique for defining a reusable class in JavaScript.)

This script-defined layout manager positions elements in its container in a stair-step fashion, so that the buttons are staggered rather than in a straight line.




```
/* Define a custom layout manager that arranges the children
** of 'container' in a stair-step fashion.*/

function StairStepButtonLayout (container) { this.initSelf(container); }
```

```
// Define its 'method' functions
function SSBL_initSelf (container) { this.container = container; }

function SSBL_layout() {
   var top = 0, left = 0;
   var width;
   var vspacing = 10, hspacing = 20;
   for (i = 0; i < this.container.children.length; i++) {
      var child = this.container.children[i];
      if (typeof child.layout != "undefined")
         // If child is a container, call its layout method
         child.layout.layout();
      child.size = child.preferredSize;
      child.location = [left, top];
      width = left + child.size.width;
      top += child.size.height + vspacing;
      left += hspacing;
   }
   this.container.preferredSize = [width, top - vspacing];
}

// Attach methods to Object's prototype
StairStepButtonLayout.prototype.initSelf = SSBL_initSelf;
StairStepButtonLayout.prototype.layout = SSBL_layout;

// Define a string containing the resource specification for the controls
res =
 "dialog { \
   whichInfo: DropDownList { alignment:'left' }, \
   allGroups: Panel { orientation:'stack', \
      info: Group { orientation: 'column', \
         name: Group { orientation: 'row', \
            s: StaticText { text:'Name:' }, \
            e: EditText { preferredSize: [200, 20] } \
         } \
      }, \
      workInfo: Group { orientation: 'column', \
         name: Group { orientation: 'row', \
            s: StaticText { text:'Company name:' }, \
            e: EditText { preferredSize: [200, 20] } \
         } \
      }, \
   }, \
   buttons: Group { orientation: 'row', alignment: 'right', \
      okBtn: Button { text:'OK', properties:{name:'ok'} }, \
      cancelBtn: Button { text:'Cancel', properties:{name:'cancel'} } \
   } \
 }";
// Create window using resource spec
win = new Window (res);
// Create list items, select first one
win.whichInfo.onChange = function () {
   if (this.selection != null) {
      for (var g = 0; g < this.items.length; g++)
         this.items[g].group.visible = false;
      this.selection.group.visible = true;
   }
}
var item = win.whichInfo.add ('item', 'Personal Info');
item.group = win.allGroups.info;
```

```
item = win.whichInfo.add ('item', 'Work Info');
item.group = win.allGroups.workInfo;
win.whichInfo.selection = win.whichInfo.items[0];

// Override the default layout manager for the 'buttons' group
// with custom layout manager
win.buttons.layout = new StairStepButtonLayout(win.buttons);

win.center();
win.show();
```

The AutoLayoutManager algorithm

When a script creates a `window` object and its elements and shows it the first time, the visible UI-platform window and controls are created. At this point, if no explicit placement of controls was specified by the script, all the controls are located at [0, 0] within their containers, and have default dimensions. Before the window is made visible, the layout manager's `layout` method is called to assign locations and sizes for all the elements and their containers.

The default `AutoLayoutManager`'s `layout` method performs these steps when invoked during the initial call to a `window` object's `show` method.

➤ **For example:**

1. Read the `bounds` property for the managed container; if undefined, proceed with auto layout. If defined, assume that the script has explicitly placed the elements in this container, and cancel the layout operation (if both the `location` and `size` property have been set, this is equivalent to setting the `bounds` property, and layout does not proceed).

2. Determine the container's margins and inter-element spacing from its `margins` and `spacing` properties, and the orientation and alignment of its child elements from the container's `orientation` and `alignChildren` properties. If any of these properties are undefined, use default settings obtained from platform and UI framework-specific default values.

3. Enumerate the child elements, and for each child:
   - If the child is a container, call its layout manager (that is, execute this entire algorithm again for the container).
   - Read its `alignment` property; if defined, override the default alignment established by the parent container with its `alignChildren` property.
   - Read its `size` property: if defined, use it to determine the child's dimensions. If undefined, read its `preferredSize` property to get the child's dimensions. Ignore the child's `location` property.

   All the per-child information is collected for later use.

4. Based on the orientation, calculate the trial location of each child in the row or column, using inter-element spacing and the container's margins.

5. Determine the column, row, or stack dimensions, based on the dimensions of the children.

6. Using the desired alignment for each child element, adjust its trial location relative to the edges of its container. For stack orientation, center each child horizontally and vertically in its container.

7. Set the `bounds` property for each child element.

8. Set the container's `preferredSize` property, based on the margins and dimensions of the row or column of child elements.

Automatic layout restrictions

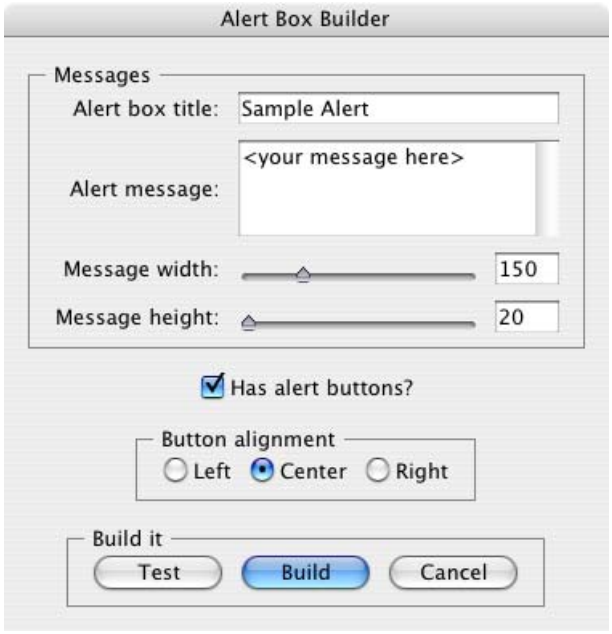
The following restrictions apply to the automatic layout mechanism:

- The default layout manager does not attempt to lay out a container that has a defined `bounds` property. The script programmer can override this behavior by defining a custom layout manager for the container.
- The layout mechanism does not track changes to element sizes after the initial layout has occurred. The script can initiate another layout by calling the layout manager's `layout` method, and can force the manager to recalculate the sizes of all child containers by passing the optional argument as `true`.
- The layout mechanism does not support re-layout if a dialog window is resized.

Example scripts

These examples demonstrate two ways of building and populating a ScriptUI dialog. The first creates each control with a separate `add` method, while the second defines a resource string that creates the control hierarchy.

The two examples create the same dialog, which collects values from the user. When the Alert Box Builder dialog is dismissed, the script builds a resource string from the collected values, and saves it to a file. That resource string can later be used to create and display the user-configured alert box.



Alert box builder

This variation builds the dialog using the window and panel `add` methods to create each control.

```
//------------- Functions -------------//
/* This function creates the builder dialog using the add method
** An alternative that uses a resource specification is shown
** in the following section */

function createBuilderDialog() {
   // Create an empty dialog window near the upper left of the screen
   var dlg = new Window('dialog', 'Alert Box Builder');
   dlg.frameLocation = [100, 100];
   // Add a panel to hold title and 'message text' strings
   dlg.msgPnl = dlg.add('panel', undefined, 'Messages');
   dlg.msgPnl.alignChildren = "right";
   dlg.msgPnl.title = dlg.msgPnl.add('group');
   dlg.msgPnl.msg = dlg.msgPnl.add('group');
   dlg.msgPnl.msgWidth = dlg.msgPnl.add('group');
   dlg.msgPnl.msgHeight = dlg.msgPnl.add('group');
   with (dlg.msgPnl) {
      title.st = title.add('statictext', undefined, 'Alert box title:');
      title.et = title.add('edittext', undefined, 'Sample Alert');
      title.et.preferredSize = [200,20];
      msg.st = msg.add('statictext', undefined, 'Alert message:');
      msg.et = msg.add('edittext', undefined, '<your message here>',
```

```
            {multiline:true});
         msg.et.preferredSize = [200,60];
         msgWidth.st = msgWidth.add('statictext', undefined, 'Message width:');
         msgWidth.sl = msgWidth.add('slider', undefined, 150, 100, 300);
         msgWidth.sl.preferredSize = [150, 20];
         msgWidth.et = msgWidth.add('edittext');
         msgWidth.et.preferredSize = [40, 20];
         msgHeight.st = msgHeight.add('statictext', undefined, 'Message height:');
         msgHeight.sl = msgHeight.add('slider', undefined, 20, 20, 300);
         msgHeight.sl.preferredSize = [150, 20];
         msgHeight.et = msgHeight.add('edittext');
         msgHeight.et.preferredSize = [40, 20];
      }
      // Add a checkbox to control the presence of buttons to dismiss the alert box
      dlg.hasBtnsCb = dlg.add('checkbox', undefined, 'Has alert buttons?');
      // Add panel to determine alignment of buttons on the alert box
      dlg.alertBtnsPnl = dlg.add('panel', undefined, 'Button alignment');
      dlg.alertBtnsPnl.orientation = "row";
      dlg.alertBtnsPnl.alignLeftRb =
         dlg.alertBtnsPnl.add('radiobutton', undefined, 'Left');
      dlg.alertBtnsPnl.alignCenterRb =
         dlg.alertBtnsPnl.add('radiobutton', undefined, 'Center');
      dlg.alertBtnsPnl.alignRightRb =
         dlg.alertBtnsPnl.add('radiobutton', undefined, 'Right');
      // Add a panel with buttons to test parameters and
      // create the alert box specification
      dlg.btnPnl = dlg.add('panel', undefined, 'Build it');
      dlg.btnPnl.orientation = "row";
      dlg.btnPnl.testBtn = dlg.btnPnl.add('button', undefined, 'Test');
      dlg.btnPnl.buildBtn = dlg.btnPnl.add('button', undefined, 'Build',
         {name:'ok'});
      dlg.btnPnl.cancelBtn =
         dlg.btnPnl.add('button', undefined, 'Cancel', {name:'cancel'});

      return dlg;
   } // createBuilderDialog

   /* This function initializes the values in the controls
   ** of the builder dialog */

   function initializeBuilder(builder) {
      // Set up initial control states
      with (builder) {
         hasBtnsCb.value = true;
         alertBtnsPnl.alignCenterRb.value = true;
         with (msgPnl) {
            msgWidth.et.text = msgWidth.sl.value;
            msgHeight.et.text = msgHeight.sl.value;
         }
      }
      // Attach event callback functions to controls
      /* The 'has buttons' checkbox enables or disables the panel that
          determines the justification of the 'alert' button group */
      builder.hasBtnsCb.onClick =
         function () { this.parent.alertBtnsPnl.enabled = this.value; };
      /* The edittext fields and scrollbars in msgPnl are connected */
      with (builder.msgPnl) {
         msgWidth.et.onChange =
            function () { this.parent.parent.msgWidth.sl.value = this.text; };
         msgWidth.sl.onChanging =
```

```
            function () { this.parent.parent.msgWidth.et.text = this.value; };
         msgHeight.et.onChange =
            function () { this.parent.parent.msgHeight.sl.value = this.text; };
         msgHeight.sl.onChanging =
            function () { this.parent.parent.msgHeight.et.text = this.value; };
      }
      with (builder.btnPnl) {
         // The Test button creates a trial Alert box from
         // the current specifications
         testBtn.onClick =
            function () {
               Window.alert('Type Enter or Esc to dismiss the test Alert box');
               createTestDialog(createResource(this.parent.parent));
            };
         // The Build and Cancel buttons close this dialog
         buildBtn.onClick =
            function () { this.parent.parent.close(1); };
         cancelBtn.onClick =
            function () { this.parent.parent.close(2); };
      };
   } // initializeBuilder

   /* This function invokes the dialog an returns its result */
   function runBuilder(builder) {
      return builder.show();
   }
   /* This function creates and returns a string containing a dialog
   ** resource specification that will create an Alert dialog using
   ** the parameters the user entered in the builder dialog. */
   function createResource(builder) {
      // Define the initial part of the resource spec with dialog parameters
      var res = "dialog { " +
         stringProperty("text", builder.msgPnl.title.et.text) +
         "\n";
      // Define the alert message statictext element, sizing it as user specified
      var textWidth = Number(builder.msgPnl.msgWidth.et.text);
      var textHeight = Number(builder.msgPnl.msgHeight.et.text);
      res += "  msg: StaticText { " +
         stringProperty("text", builder.msgPnl.msg.et.text) +
         " preferredSize: [" + textWidth + ", " + textHeight + "],\n" +
         "    justify:'center', properties:{multiline:true} }";
      // Define buttons if desired
      var hasButtons = builder.hasBtnsCb.value;
      if (hasButtons) {
         var groupAlign = "center";
         // Align buttons as specified
         if (builder.alertBtnsPnl.alignLeftRb.value)
            groupAlign = "left";
         else if (builder.alertBtnsPnl.alignRightRb.value)
            groupAlign = "right";
         res += ",\n" +
            "  btnGroup: Group {\n" +
            stringProperty("    alignment", groupAlign) +
            "\n" +
            "    okBtn: Button { " +
            stringProperty("text", "OK") +"},\n";
         res += "    cancelBtn: Button { " +
            stringProperty("text", "Cancel") +"}" +
            "  }";
      }
```

```
   // done
   res += "\n}";
   return res;
}
function stringProperty(pname, pval) {
   return pname + ":'" + pval + "', ";
}
function createTestDialog(resource) {
   var target = new Window (resource);
   target.center();
   return target.show();
}
//------------- Main script -------------//
var builder = createBuilderDialog(); //for an alternative, see below
initializeBuilder(builder);
if (runBuilder(builder) == 1) {
   // Create the Alert dialog resource specification string
   var resSpec = createResource(builder);
   // Write the resource spec string to a file w/platform file-open dialog
   var fname = File.openDialog('Save resource specification');
   var f = File(fname);
   if (f.open('w')) {
      var ok = f.write(resSpec);
      if (ok)
         ok = f.close();
      if (! ok)
         Window.alert("Error creating " + fname + ": " + f.error);
   }
}
```

Resource specification example

This example provides an alternative method of building the same initial Alert box builder dialog, using a resource specification instead of explicit calls to the `add` method of a container element. To use this alternate version, add this code to the beginning of the previous example in place of the `createBuilderDialog` function. In the main script, replace the line:

```
var builder = createBuilderDialog();
```

with this line:

```
var builder = createBuilderDialogFromResource();
```

The new code follows:

```
var alertBuilderResource =
   "dialog { \
      text: 'Alert Box Builder', frameLocation:[100,100], \
      msgPnl: Panel { orientation:'column', alignChildren:'right', \
         text: 'Messages', \
         title: Group { \
            st: StaticText { text:'Alert box title:' }, \
            et: EditText { text:'Sample Alert', \
                  preferredSize:[200, 20] } \
         }, \
         msg: Group { \
            st: StaticText { text:'Alert message:' }, \
            et: EditText { text:'<your message here>', \
                  preferredSize:[200, 60], properties:{multiline:true} } \
         }, \
```

```
            msgWidth: Group { alignChildren:'center', \
               st: StaticText { text:'Message width:' }, \
               sl: Slider { minvalue:100, maxvalue:300, value:150, \
                     preferredSize:[150, 20] }, \
               et: EditText { preferredSize:[40, 20] } \
            }, \
            msgHeight: Group { alignChildren:'center', \
               st: StaticText { text:'Message height:' }, \
               sl: Slider { minvalue:20, maxvalue:300, \
                     preferredSize:[150, 20] }, \
               et: EditText { preferredSize:[40, 20] } \
            } \
         }, \
         hasBtnsCb: Checkbox { text:'Has alert buttons?', \
                        alignment:'center' }, \
         alertBtnsPnl: Panel { orientation:'row', \
            text: 'Button alignment', \
            alignLeftRb: RadioButton { text:'Left' }, \
            alignCenterRb: RadioButton { text:'Center' }, \
            alignRightRb: RadioButton { text:'Right' } \
         }, \
         btnPnl: Panel { orientation:'row', \
            text: 'Build it', \
            testBtn: Button { text:'Test' }, \
            buildBtn: Button { text:'Build', properties:{name:'ok'} }, \
            cancelBtn: Button { text:'Cancel', properties:{name:'cancel'} } \
         } \
      }";

// This function creates the builder dialog from the resource string
function createBuilderDialogFromResource() {
   var builder = new Window(alertBuilderResource);
   return builder;
} // createBuilderDialogFromResource
```

Localization in ScriptUI Objects

For portions of your user interface that are displayed on the screen, you may want to localize the displayed text. You can localize the display strings in any ScriptUI object (including These tables list unique identifiers for the top-level menus in Adobe Bridges) simply and efficiently, using the Global localize function. This function takes as its argument a *localization object* containing the localized versions of a string.

For complete details of this ExtendScript feature, see Localizing ExtendScript Strings.

A localization object is a JavaScript object literal whose property names are locale names, and whose property values are the localized text strings. The locale name is an identifier as specified in the ISO 3166 standard. In this example, a `btnText` object contains localized text strings for several locales. This object supplies the text for a `Button` to be added to a window `w`:

```
btnText = { en: "Yes", de: "Ja", fr: "Oui" };
b1 = w.add ("button", undefined, localize (btnText));
```

The `localize` function extracts the proper string for the current locale. It matches the current locale and platform to one of the object's properties and returns the associated string. On a German system, for example, the property `de` provides the string `"Ja"`.

When your script uses localization to provide language-appropriate strings for UI elements, it should also take advantage of the Automatic Layout feature. The layout manager can determine the best size for each UI element based on its localized `text` value, automatically adjusting the layout of your script-defined dialogs to allow for the varying widths of strings for different languages.

Variable values in localized strings

The `localize` function allows you to include variables in the string values. Each variable is replaced with the result of evaluating an additional argument. For example:

```
today = {
   en: "Today is %1/%2.",
   de: "Heute ist der %2.%1."
   };
d = new Date();
Window.alert (localize (today, d.getMonth()+1, d.getDate()));
```

Enabling automatic localization

If you do not need variable replacement, you can use automatic localization. To turn on automatic localization, set the global value:

```
$.localization=true
```

When it is enabled, you can specify a localization object directly as the value of any property that takes a localizable string, without using the `localize` function. For example:

```
btnText = { en: "Yes", de: "Ja", fr: "Oui" };
b1 = w.add ("button", undefined, btnText);
```

The `localize` function always performs its translation, regardless of the setting of the `$.localize` variable. For example:

```
//Only works if the $.localize=true
b1 = w.add ("button", undefined, btnText);
```

```
//Always works, regardless of $.localize value
b1 = w.add ("button", undefined, localize (btnText));
```

If you need to include variables in the localized strings, use the `localize` function.

5 ScriptUI Object Reference

Overview

ScriptUI is a component that works with the ExtendScript JavaScript interpreter to provide JavaScript programs with the ability to create and interact with user interface elements. It provides an object model for windows and UI control elements within an Adobe Creative Suite 2 application.

For an overview of the ScriptUI object model and a description of usage, see Chapter 4, "Using ScriptUI."

This chapter provides the details of the ScriptUI classes and objects with their properties, methods, and creation parameters.

Window Class

The `Window` class defines these static properties and functions which are available globally through reference to the class. Window instances created with `new Window()` do not have these properties and functions.

Window class properties

`coreVersion`	String	The internal core version number of the ScriptUI components. Read only.
`version`	String	The main version number of the ScriptUI components. Read only.

Window class functions

`alert` `Window.alert (`*`message`*`[, title, errorIcon])`	Displays the localizable *`message`* string in a user alert box that provides an **OK** button. For details, see the ExtendScript alert function. The alert dialog is not intended for lengthy messages. When the string argument is too long, the alert dialog truncates it.
`confirm` `Window.confirm (`*`message`*`[,noAsDflt ,title ])`	Displays the localizable *`message`* string in a self-sizing modal dialog box with **Yes** and **No** buttons. Returns `true` if the user clicks **Yes**, `false` if the user clicks **No**. For details, see the ExtendScript confirm function. The confirmation dialog can show longer messages than the alert and prompt dialogs, but if this string is too long, the dialog truncates it.

`find`
`Window.find (`*`resourceName`*`)`
`Window.find (`*`type, title`*`)`
	Finds and returns an existing window object, which can be a window already created by a script, or a windows created by the application (if the application supports this case).
	`resourceName`: A named resource that identifies a window that the application exposes to JavaScript. (Not supported in all ScriptUI implementations.)
	`type`: The window creation type, `dialog`. Used to distinguish between windows with the same title. If the type is unimportant, pass `null` or an empty string.
	`title`: The title of the window to find.
	If it finds an existing window, the method returns the corresponding JavaScript `window` object. If not, it returns `null`.

getResourceText `Window.getResourceText (textResource)`	Finds and returns a text string representation of the *textResource* from the host application's resource data. If no string resource matches the *textResource* name, the name is treated as literal text.
prompt `Window.prompt (message, preset[, title ])`	Displays a modal dialog that returns the user's text input. • When the user clicks **OK** to dismiss the dialog, the method returns the text the user entered. • When the user clicks the **Cancel** button, the method returns `null`. For details, see the ExtendScript prompt function.

Window Object

Window object constructor

To create a new `Window` object:

```
new Window (type [, title, bounds, {creation_properties}]);
```

type	The window type. The value is: `dialog`: Creates a modal dialog.
title	Optional. The window title. A localizable string.
bounds	Optional. The window's position and size.
creation_properties	Optional. An object that can contain any of these properties: `resizeable`: When `true`, the window can be resized by the user. Default is `false`. `su1PanelCoordinates`: When `true`, the child panels of this window automatically adjust the positions of their children for compatibility with Photoshop CS (in which the vertical coordinate was measured from outside the frame). Default is `false`. Individual panels can override the parent window's setting.

Creates and returns a new `window` object, or `null` if window creation failed.

Window object properties

Window elements contain the following properties, in addition to those common to all ScriptUI elements:

defaultElement	Object	For a window of type `dialog`, the control to notify when a user types the ENTER key. By default, looks for a `button` whose name or text is "ok" (case disregarded).
cancelElement	Object	For a window of type `dialog`, the control to notify when a user types the ESC key in Windows®, or the CMD. combination in Mac OS®. By default, looks for a `button` whose name or text is "`cancel`" (case disregarded).

frameBounds	Bounds	A Bounds object for the boundaries of the Window's frame in screen coordinates. The frame consists of the title bar and borders that enclose the content region of a window, depending on the windowing system. Read only.
frameLocation	Point	A Point object for the location of the top left corner of the Window's frame. The same as `[frameBounds.x, frameBounds.y]`. Set this value to move the window frame to the specified location on the screen. The `frameBounds` value changes accordingly.
frameSize	Dimension	A Dimension object for the size and location of the Window's frame in screen coordinates. Read only.

Container properties

The following table shows properties that are available on `window` objects and container objects (controls of type `panel` and `group`).

`alignChildren`	String	Tells the layout manager how unlike-sized children of a container should be aligned within a column or row. Order of creation determines which children are at the top of a column or the left of a row; the earlier a child is created, the closer it is to the top or left of its column or row.
		If defined, `alignment` for a child element overrides the `alignChildren` setting for the parent container.
		Allowed values depend on the `orientation` value. For `orientation=row`:
		`top`
		`bottom`
		`center (default)`
		`fill`
		For `orientation=column`:
		`left`
		`right`
		`center (default)`
		`fill`
		For `orientation=stack`:
		`top`
		`bottom`
		`left`
		`right`
		`center (default)`
		`fill`
		Values are not case sensitive.

`children`	Array of Object	The collection of UI elements that have been added to this container (`window`, `panel`, `group`). An array indexed by number or by a string containing an element's `name`. The `length` property of this array is the number of child elements for container elements, and is zero for controls. Read only.
`layout`	LayoutManager	A LayoutManager Object for a container (`window`, `panel`, `group`). The first time a container object is made visible, ScriptUI invokes this layout manager by calling its `layout` function. Default is an instance of the `LayoutManager` class that is automatically created when the container element is created.
`margins`	Margins	A Margins object describing the number of pixels between the edges of this container and the outermost child elements. You can specify different margins for each edge of the container. The default value is based on the type of container, and is chosen to match the standard Adobe UI guidelines.

orientation	String	How elements are organized within this container. Interpreted by the layout manager for the container. The default LayoutManager Object accepts the (case-insensitive) values:
		`row`
		`column`
		`stack`
		The default orientation depends on the type of container. For `Window` and `Panel`, the default is `column`, and for `Group` the default is `row`.
		The allowed values for the container's `alignChildren` and its children's `alignment` properties depend on the orientation.

spacing	Number	The number of pixels separating one child element from its adjacent sibling element. Because each container holds only a single row or column of children, only a single spacing value is needed for a container. The default value is based on the type of container, and is chosen to match standard Adobe UI guidelines.

Window object functions

These functions are defined for `window` objects.

add `(type [, bounds, text, { creation_props> } ]);`	Creates and returns a new control or container object and adds it to the children of this window. Returns `null` if unable to create the object.
type	The control type. See Control types and creation parameters.
bounds	Optional. A bounds specification that describes the size and position of the new control or container, relative to its parent. See Bounds object for specification formats. If supplied, this value creates a new Bounds object which is assigned to the new object's `bounds` property.
text	Optional. String. Initial text to be displayed in the control as the title, label, or contents, depending on the control type. If supplied, this value is assigned to the new object's `text` property.
creation_props	Optional. Object. The properties of this object specify creation parameters, which are specific to each object type. See Control types and creation parameters.
center *windowObj*`.center ([`*window*`])`	Centers this window on the screen, or with respect to another specified window.
window	Optional. A Window Object.

close *windowObj*.close ([*result*])	Closes this window. If an onClose callback is defined for the window, calls that function before closing the window.
result	Optional. A number to be returned from the show method that invoked this window as a modal dialog.
hide *windowObj*.hide()	Hides this window. When a window is hidden, its children are also hidden, but when it is shown again, the children retain their own visibility states. For a modal dialog, closes the dialog and sets its result to 0.
notify *windowObj*.notify([*event*])	Sends a notification message, simulating the specified user interaction event. For example, to simulate a dialog being moved by a user: `myDlg.notify("onMove")`
event	Optional. The name of the window event handler to call. One of: onClose onMove onMoving onResize onResizing onShow
remove *windowObj*.remove(*index*) *windowObj*.remove(*text*) *windowObj*.remove(*child*)	Removes the specified child control from this window's children array. No error results if the child does not exist. Returns undefined.
index *text* *child*	The child control to remove, specified by 0-based index, text value, or as a control object.
show *windowObj*.show()	Shows this window, container, or control. If an onShow callback is defined for a window, calls that function before showing the window. When a window or container is hidden, its children are also hidden, but when it is shown again, the children retain their own visibility states. For a modal dialog, opens the dialog and does not return until the dialog is dismissed. If it is dismissed via the close method, this method returns any *result* value passed to that method. Otherwise, returns 0.

Window event-handling callbacks

The following callback functions can be defined to respond to events in windows. To respond to an event, define a function with the corresponding name in the window object.

Callback	Description
onClose	Called when a request is made to close the window, either by an explicit call to the close function or by a user action (clicking the OS-specific close icon in the title bar). The function is called before the window actually closes; it can return false to cancel the close operation.
onMove	Called when the window has been moved.

Callback	Description
`onMoving`	Called while a window in being moved, each time the position changes. A handler can monitor the move operation.
`onResize`	Called when the window has been resized.
`onResizing`	Called while a window is being resized, each time the height or width changes. A handler can monitor the resize operation.
`onShow`	Called when a request is made to open the window using the show method, before the window is made visible, but after automatic layout is complete. A handler can modify the results of the automatic layout.

Control Objects

Control object constructors

Use the `add` method to create new containers and controls. The `add` method is available on `window` and container (`panel` and `group`) objects. (See also add for dropdownlist and listbox controls.)

add *(type [, bounds, text,* *{ creation_props> }]);*	Creates and returns a new control or container object and adds it to the children of this window or container. Returns `null` if unable to create the object.

type	The control type. See Control types and creation parameters.
bounds	Optional. A bounds specification that describes the size and position of the new control or container, relative to its parent. See Bounds object for specification formats. If supplied, this value creates a new Bounds object which is assigned to the new object's `bounds` property.
text	Optional. String. Initial text to be displayed in the control as the title, label, or contents, depending on the control type. If supplied, this value is assigned to the new object's `text` property.
creation_props	Optional. Object. The properties of this object specify creation parameters, which are specific to each object type. See Control types and creation parameters.

Control types and creation parameters

The following type names can be used in string literals as the `type` specifier for the `add` method, available on `window` and container (`panel` and `group`) objects. The class names can used in resource specifications to define controls within a window or panel.

Type name	Class name	Description
button	`Button`	A pushbutton containing a text string. Calls the onClick callback if the control is clicked or if its notify method is called. To add to a window `w`: `w.add ("button" [, bounds, text ]);` *bounds*: Optional. The control's position and size. *text*: Optional. The text displayed in the control.
checkbox	`Checkbox`	A dual-state control showing a box with a checkmark when `value=true`, empty when `value=false`. Calls the onClick callback if the control is clicked or if its notify method is called. To add to a window `w`: `w.add ("checkbox" [, bounds, text ]);` *bounds*: Optional. The control's position and size. *text*: Optional. The text displayed in the control.

Type name	Class name	Description
dropdownlist	DropDownList	A drop-down list with zero or more items. Calls the onChange callback if the item selection is changed or if its notify method is called. To add to a window w: `w.add ("dropdown list", bounds [, items] [, {creation_properties}]);` *bounds*: The control's position and size. *items*: Optional. Supply this argument or the *creation_properties* argument, not both. An array of strings for the text of each list item. An item object is created for each item. An item with the text string "-" creates a separator item. *creation_properties*: Optional. Supply this argument or the *items* argument, not both. This form is most useful for elements defined using Resource Specifications. An object that contains the following property: **items**: An array of strings for the text of each list item. An item object is created for each item. An item with the text string "-" creates a separator item.
edittext	EditText	An edit text field that the user can change. Calls the onChange callback if the text is changed and the user types ENTER or the control loses focus, or if its notify method is called. Calls the onChanging callback when any change is made to the text. The textselection property contains currently selected text. To add to a window w: `w.add ("edittext" [, bounds, text, {creation_properties}]);` *bounds*: Optional. The control's position and size. *text*: Optional. The text displayed in the control. *creation_properties*: Optional. An object that contains any of the following properties: **multiline**: When false (the default), the control accepts a single line of text. When true, the control accepts multiple lines, in which case the text wraps within the width of the control. **readonly**: When false (the default), the control accepts text input. When true, the control does not accept input but only displays the contents of the text property. **noecho**: When false (the default), the control displays input text. When true, the control does not display input text (used for password input fields). **enterKeySignalsOnChange**: When false (the default), the control signals an onChange event when the editable text is changed and the control loses the keyboard focus (that is, the user tabs to another control, clicks outside the control, or types ENTER). When true, the control only signals an onChange event when the editable text is changed and the user types ENTER; other changes to the keyboard focus do not signal the event.

Type name	Class name	Description
group	Group	A container for other controls. Containers have additional properties that control the children; see Container properties. Hiding a group hides all its children. Making it visible makes visible those children that are not individually hidden. To add to a window w: `w.add ("group" [, bounds]);` *bounds*: Optional. The element's position and size.
iconbutton	IconButton	A pushbutton containing an icon. Calls the onClick callback if the control is clicked or if its notify method is called. To add to a window w: `w.add ("iconbutton" [, bounds, icon, {creation_properties}]);` *bounds*: Optional. The control's position and size. *icon*: Optional. The named resource for the icon or family of icons displayed in the button control, or a pathname or File Object for an image file. Images must be in PNG format. *creation_properties*: Optional. An object that contains the following property: **style**: A string for the visual style, one of: button: Has a visible border with a raised or 3D appearance. toolbutton: Has a flat appearance, appropriate for inclusion in a toolbar
image	Image	Displays an icon or image. To add to a window w: `w.add ("image" [, bounds, icon]);` *bounds*: Optional. The control's position and size. *icon*: Optional. The named resource for the icon or family of icons displayed in the image control, or a pathname or File Object for an image file. Images must be in PNG format.
item	ListItem	A choice item in a list box or drop-down list. The objects are created when items are specified on creation of the parent list object, or afterward using the list control's add method. • Items in a drop-down list can be of type separator, in which case they cannot be selected, and are shown as a horizontal line. Item objects have these properties which are not found in other controls: index selected

Type name	Class name	Description
listbox	ListBox	A list box with zero or more items. Calls the onChange callback if the item selection is changed or if its notify method is called. To add to a window w: `w.add ("listbox", bounds [, items, {creation_properties}]);` *bounds*: Optional. The control's position and size. *items*: Optional. An array of strings for the text of each list item. An item object is created for each item. Supply this argument, or the items property in *creation_properties*, not both. *creation_properties*: Optional. An object that contains any of the following properties: **multiselect**: When false (the default), only one item can be selected. When true, multiple items can be selected. **items**: An array of strings for the text of each list item. An item object is created for each item. An item with the text string "-" creates a separator item. Supply this property, or the items argument, not both. This form is most useful for elements defined using Resource Specifications.
panel	Panel	A container for other types of controls, with an optional frame. Containers have additional properties that control the children; see Container properties. Hiding a panel hides all its children. Making it visible makes visible those children that are not individually hidden. To add to a window w: `w.add ("panel" [, bounds, text, {creation_properties} ]);` *bounds*: Optional. The element's position and size. A panel whose width is 0 appears as a vertical line. A panel whose height is 0 appears as a horizontal line. *text*: Optional. The text displayed in the border of the panel. *creation_properties*: Optional. An object that contains the following property: **borderStyle**: A string that specifies the appearance of the border drawn around the panel. One of black, etched, gray, raised, sunken. Default is etched. **su1PanelCoordinates**: When true, this panel automatically adjusts the positions of its children for compatability with Photoshop CS. Default is false, meaning that the panel does not adjust the positions of its children, even if the parent window has automatic adjustment enabled.

Type name	Class name	Description
progressbar	Progressbar	A horizontal rectangle that shows progress of an operation. All progressbar controls have a horizontal orientation. The value property contains the current position of the progress indicator; the default is 0. There is a minvalue property, but it is always 0; attempts to set it to a different value are silently ignored. To add to a window w: w.add ("progressbar" [, *bounds*, *value*, *maxvalue*]); *bounds*: Optional. The control's position and size. *value*: Optional. The initial position of the progress indicator. Default is 0. *maxvalue*: Optional. The maximum value that the value property can be set to. Default is 100.
radiobutton	RadioButton	A dual-state control, grouped with other radiobuttons, of which only one can be in the selected state. Shows the selected state when value=true, empty when value=false. Calls the onClick callback if the control is clicked or if its notify method is called. All radiobuttons in a group must be created sequentially, with no intervening creation of other element types. Only one radiobutton in a group can be set at a time; setting a different radiobutton unsets the original one. To add to a window w: w.add ("radiobutton" [, *bounds*, *text*]); *bounds*: Optional. The control's position and size. *text*: Optional. The text displayed in the control.

Type name	Class name	Description
scrollbar	Scrollbar	A scrollbar with a draggable scroll indicator and stepper buttons to move the indicator. The scrollbar control has a horizontal orientation if the width is greater than the height at creation time, or vertical if its height is greater than its width. Calls the onChange callback after the position of the indicator is changed or if its notify method is called. Calls the onChanging callback repeatedly while the user is moving the indicator. The value property contains the current position of the scrollbar's indicator within the scrolling area, within the range of minvalue and maxvalue. The stepdelta property determines the scrolling unit for the up or down arrow; default is 1. The jumpdelta property determines the scrolling unit for a jump (as when the bar is clicked outside the indicator or arrows); default is 20% of the range between minvalue and maxvalue. To add to a window w: `w.add ("scrollbar" [, bounds, value, minvalue, maxvalue]);` *bounds*: Optional. The control's position and size. *value*: Optional. The initial position of the scroll indicator. Default is 0. *minvalue*: Optional. The minimum value that the value property can be set to. Default is 0. Together with *maxvalue*, defines the scrolling range. *maxvalue*: Optional. The maximum value that the value property can be set to. Default is 100. Together with *minvalue*, defines the scrolling range.

Type name	Class name	Description
slider	Slider	A slider with a moveable position indicator. All slider controls have a horizontal orientation. Calls the onChange callback after the position of the indicator is changed or if its notify method is called. Calls the onChanging callback repeatedly while the user is moving the indicator. The value property contains the current position of the indicator within the range of minvalue and maxvalue. To add to a window w: w.add ("slider" [, *bounds*, *value*, *minvalue*, *maxvalue*]); *bounds*: Optional. The control's position and size. *value*: Optional. The initial position of the indicator. Default is 0. *minvalue*: Optional. The minimum value that the value property can be set to. Default is 0. Together with *maxvalue*, defines the range. *maxvalue*: Optional. The maximum value that the value property can be set to. Default is 100. Together with *minvalue*, defines the range.
statictext	StaticText	A text field that the user cannot change. To add to a window w: w.add ("statictext" [, *bounds*, *text*, {*creation_properties*}]); *bounds*: Optional. The control's position and size. *text*: Optional. The text displayed in the control. *creation_properties*: Optional. An object that contains any of the following properties: **multiline**: When false (the default), the control displays a single line of text. When true, the control displays multiple lines, in which case the text wraps within the width of the control. **scrolling**: When false (the default), the displayed text cannot be scrolled. When true, the displayed text can be vertically scrolled using the UP ARROW and DOWN ARROW; this case implies multiline=true.

Control object properties

The following table shows the properties of all ScriptUI elements. Some values apply only to controls of particular types, as indicated.

active	Boolean	When `true`, the object is active, `false` otherwise. Set to `true` to make a given control or dialog active. • A modal dialog that is visible is by definition the active dialog. • An active control is the one with focus—that is, the one that accepts keystrokes, or in the case of a `Button`, be selected when the user types a Return.

alignment	String	Applies to child elements of a container. If defined, this value overrides the `alignChildren` setting for the parent container. Allowed values depend on the `orientation` value of the parent container. For `orientation=row`:
		`top`
		`bottom`
		`center (default)`
		`fill`
		For `orientation=column`:
		`left`
		`right`
		`center (default)`
		`fill`
		For `orientation=stack`:
		`top`
		`bottom`
		`left`
		`right`
		`center (default)`
		`fill`
		Values are not case sensitive.

bounds	Bounds	A Bounds object describing the boundaries of the element, in screen coordinates for `window` elements, and parent-relative coordinates for child elements. For windows, the bounds refer only to the window's content region. Setting an element's `size` or `location` changes its `bounds` property, and vice-versa.
enabled	Boolean	When `true`, the control is enabled, meaning that it accepts input. When `false`, control elements do not accept input, and all types of elements have a grayed-out appearance.
helpTip	String	A brief help message (also called a *tool tip*) that is displayed in a small floating window when the mouse cursor hovers over a UI control element. Set to an empty string or `null` to remove help text.

icon	String or File	The name of an icon resource or the pathname or File Object for a file that contains a platform-specific icon image in PNG format. • For an IconButton, the icon appears as the content of the button. • For a ListItem, the icon is displayed to the left of the text. • For an Image, the icon is the entire content of the image element.
index	Number	For ListItem objects only. The index of this item in the items collection of its parent list control. Read-only.
items	Array of Object	For a list object (listbox or dropdown list), a collection of ListItem objects for the items in the list. Access by 0-based index. To obtain the number of items in the list, use items.length. Read-only.
itemSize	Dimension	For a list object (listbox or dropdown list), a Dimension object describing the width and height in pixels of each item in the list. Used by auto-layout to determine the preferredSize of the list, if not otherwise specified. If not set explicitly, the size of each item is set to match the largest height and width among all items in the list
jumpdelta	Number	The amount to increment or decrement a scrollbar indicator's position when the user clicks ahead or behind the moveable element. Default is 20% of the range between the maxvalue and minvalue property values.

justify	String	The justification of text in static text and edit text controls. One of:
		`left (default)`
		`center`
		`right`
		Note: Justification only works if the value is set before the window containing the control is displayed for the first time.

location	Point	A Point object describing the location of the element as an array, [x, y], representing the coordinates of the upper left corner of the element. These are screen coordinates for window elements, and parent-relative coordinates for other elements. The location is defined as [bounds.x, bounds.y]. Setting an element's location changes its bounds property, and vice-versa. By default, location is undefined.
maxvalue	Number	The maximum value that the value property can have. If maxvalue is reset less than value, value is reset to maxvalue. If maxvalue is reset less than minvalue, minvalue is reset to maxvalue.

minvalue	Number	The minimum value that the value property can have. If minvalue is reset greater than value, value is reset to minvalue. If minvalue is reset greater than maxvalue, maxvalue is reset to minvalue.
parent	Object	The parent object of a UI object, a window, panel or group, or null for window objects. Read only.
preferredSize	Dimension	A Dimension object used by layout managers to determine the best size for each element. If not explicitly set by a script, value is established by the UI framework in which ScriptUI is employed, and is based on such attributes of the element as its text, font, font size, icon size, and other UI framework-specific attributes. A script can explicitly set preferredSize before the layout manager is invoked in order to establish an element size other than the default.
properties	Object	An object that contains one or more creation properties of the element (properties used only when the element is created).
selected	Boolean	For ListItem objects only. When true, the item is part of the selection for its parent list. When false, the item is not selected. Set to true to select this item in a single-selection list, or to add it to the to the selection array for a multi-selection list.
selection	ListItem, Array of ListItem	For a list object (listbox or dropdown list), the currently selected ListItem object for a single-selection list, or an array of ListItem objects for current selection in a multi-selection list. Setting this value causes the selected item to be highlighted and to be scrolled into view if necessary. You can set the value using the index of an item or an array of indices, rather than object references. If set to an index value that is out of range, the operation is ignored. When set with index values, the property still returns object references. • If you set the value to an array for a single-selection list, only the first item in the array is selected. • If you set the value to a single item for a multi-selection list, that item is added to the current selection. If no items are selected, the value is null. Set to null to deselect all items.
size	Dimension	A Dimension object that defines the actual dimensions of an element. Initially undefined, and unless explicitly set by a script, it is defined by a LayoutManager. A script can explicitly set size before the layout manager is invoked to establish an element size other than the preferredSize or the default size. Defined as [bounds.width, bounds.height]. Setting an element's size changes its bounds property, and vice-versa.
stepdelta	Number	The amount by which to increment or decrement a Scrollbar element's position when the user clicks a stepper button.

text	String	The title, label, or displayed text. Ignored for certain window types. For controls, the meaning depends on the control type. Buttons use the `text` as a label, for example, while edit fields use the `text` to access the content. This is a localizable string: see Localization in ScriptUI Objects
textselection	String	The currently selected text in a control that displays text, or the empty string if there is no text selected. Setting the value replaces the current text selection and modifies the value of the `text` property. If there is no current selection, inserts the new value into the `text` string at the current insertion point. The `textselection` value is reset to an empty string after it modifies the `text` value. **Note:** Setting the `textselection` property before the `edittext` control's parent `Window` exists is an undefined operation.
type	String	Contains the type name of the element, as specified on creation. • For `window` objects, one of the type names `window` or `dialog`. • For controls, the type of the control, as specified in the `add` method that created it. Read only.
value	Boolean	For a checkbox or radiobutton, `true` if the control is in the selected or set state, `false` if it is not.
value	Number	For a scrollbar or slider, the current position of the indicator. If set to a value outside the range specified by `minvalue` and `maxvalue`, it is automatically reset to the closest boundary.
visible	Boolean	When `true`, the element is shown, when `false` it is hidden. When a container is hidden, its children are also hidden, but they retain their own visibility values, and are shown or hidden accordingly when the parent is next shown.

Control object functions

The following table shows the methods defined for each element type, and for specific control types as indicated.

add *listObj*.add (*type*, *text*[, *index*])	For list objects (listbox or dropdown list) only. Adds an item to the items array at the given index. Returns the item control object for type=item, or null for type=separator.
type	The type of item to add. One of: item: A basic, selectable item with a text label. separator: A separator. For dropdownlist controls only. In this case, the *text* value is ignored, and the method returns null.
text	The localizable text label for the item.
index	Optional. The index into the current item list after which this item is inserted. If not supplied, or greater than the current list length, the new item is added at the end.
find *listObj*.find(*text*)	For list objects (listbox or dropdown list) only. Looks in this object's items array for an item object with the given text value. Returns the item object if found; otherwise, returns null.
text	The text of the item to find.
hide *controlObj*.hide()	Hides this container or control. When a window or container is hidden, its children are also hidden, but when it is shown again, the children retain their own visibility states.
notify *controlObj*.notify([*event*])	Sends a notification message, simulating the specified user interaction event.
event	Optional. The name of the control event handler to call. One of: onClick onChange onChanging By default, simulates the onChange event for an edittext control, an onClick event for controls that support that event.
remove *containerObj*.remove(*index*) *containerObj*.remove(*text*) *containerObj*.remove(*child*)	For containers (panel, group), removes the specified child control from the container's children array. For list objects (listbox or dropdown list) only, removes the specified item from this object's items array. No error results if the item does not exist.
index *text* *child*	The item or child to remove, specified by 0-based index, text value, or as a control object.
removeAll *listObj*.removeAll()	For list objects (listbox or dropdown list) only. Removes all items from the object's items array.
show *controlObj*.show()	Shows this container or control. When a window or container is hidden, its children are also hidden, but when it is shown again, the children retain their own visibility states.

toString *listItemObj*.toString()	For item controls only. Returns the value of this item's text property as a string.
valueOf *listItemObj*.valueOf()	For item controls only. Returns the index number of this item in the parent list's items array.

Control event-handling callbacks

The following events are signalled in certain types of controls. To handle the event, define a function with the corresponding name in the control object.

onClick	Called when the user clicks one of the following control types: button checkbox iconbutton radiobutton
onChange	Called when the user finishes making a change in one of the following control types: dropdownlist edittext listbox scrollbar slider • For an edittext control, called only when the change is complete—that is, when focus moves to another control, or the user types ENTER. The exact behavior depends on the creation parameter enterKeySignalsOnChange; see the edittext description. • For a slider or scrollbar, called when the user has finished dragging the position marker or has clicked the control.
onChanging	Called for each incremental change in one of the following control types: edittext scrollbar slider • For an edittext control, called for each keypress while the control has focus. • For a slider or scrollbar, called for any motion of the position marker.

Size and Location Objects

ScriptUI defines objects to represent the complex values of properties that place and size windows and UI elements. These objects cannot be created directly, but are created when you set the corresponding property. That property then returns that object. For example, the `bounds` property returns a `Bounds` object.

You can set these properties as objects, strings, or arrays.

- `e.prop = Object`: The object must contain the set of properties defined for this type, as shown in the table below. The properties have integer values.
- `e.prop = String`: The string must be an executable JavaScript inline object declaration, conforming to the same object description.
- `e.prop = Array`: The array must have integer coordinate values in the order defined for this type, as shown in the table below. For example:

The following examples show equivalent ways of placing a 380 by 390 pixel window near the upper left corner of the screen:

```
var dlg = new Window('dialog', 'Alert Box Builder');
dlg.bounds = {x:100, y:100, width:380, height:390}; //object
dlg.bounds = {left:100, top:100, right:480, bottom:490}; //object
dlg.bounds = "x:100, y:100, width:380, height:390"; //string
dlg.bounds = "left:100, top:100, right:480, bottom:490"; //string
dlg.bounds = [100,100,480,490]; //array
```

You can access the resulting object as an array with values in the order defined for the type, or as an object with the properties supported for the type.

The following table shows the property-value object types, the element properties that create and contain them, and their array and object-property formats.

`Bounds`	Defines the boundaries of a window within the screen's coordinate space, or of a UI element within the container's coordinate space. Contains an array, `[left, top, right, bottom]`, that defines the coordinates of the upper left and lower right corners of the element. A `Bounds` object is created when you set an element's `bounds` property, and this property returns a `Bounds` object. • An object must contain properties named `left`, `top`, `right`, `bottom`, or `x`, `y`, `width`, `height`. • An array must have values in the order `[left, top, right, bottom]`.
`Dimension`	Defines the size of a `window` or UI element. Contains an array, `[width, height]`, that defines the element's size in pixels. A `Dimension` object is created when you set an element's `size` or `preferredSize` property. • An object must contain properties named `width` and `height`. • An array must have values in the order `[width, height]`.

Margins	Defines the number of pixels between the edges of a container and its outermost child elements. Contains an array `[left, top, right, bottom]` whose elements define the margins between the left edge of a container and its leftmost child element, and so on. A `Margins` object is created when you set an element's `margins` property. • An object must contain properties named `left`, `top`, `right`, and `bottom`. • An array must have values in the order `[left, top, right, bottom]`. You can also set the `margins` property to a number; all of the array values are then set to this number.
Point	Defines the location of a `window` or UI element. Contains an array, `[x, y]`, whose values represent the origin point of the element as horizontal and vertical pixel offsets from the origin of the element's coordinate space. A `Point` object is created when you set an element's `location` property. • An object must contain properties named `x` and `y`. • An array must have values in the order `[x, y]`.

LayoutManager Object

Controls the automatic layout behavior for a window or container. The subclass AutoLayoutManager implements the default automatic layout behavor.

AutoLayoutManager object constructor

Create an instance of the `AutoLayoutManager` class with the `new` operator:

```
myWin.layout = new AutoLayoutManager(myWin);
```

An instance is automatically created when you create a `window` or container (`group` or `panel`) object, and referenced by the container's layout property. This instance implements the default layout behavior unless you override it.

AutoLayoutManager object properties

The default object has no predefined properties, but a script can assign arbitrary properties to an object it creates, to store data needed by the script-defined layout algorithm.

AutoLayoutManager object functions

`layout` *`win`*`.layout.layout (`*`recalculate`*`)`	Invokes the automatic layout behavior for the managed container. Adjusts sizes and positions of the child elements of this window or container according to the placement and alignment property values in the parent and children. Invoked automatically the first time the window is displayed. Thereafter, the script must invoke it explicitly to change the layout in case of changes in the size or position of the parent or children.
`recalculate`	Optional. When `true`, forces the layout manager to recalculate the container size for this and any child containers. Default is `false`.

These tables list unique identifiers for the top-level menus in Adobe Bridge

6 Using File and Folder Objects

Overview

Because path name syntax is very different in Windows, Mac OS and UNIX®, Adobe ExendScript defines the `File` and `Folder` objects to provide platform-independent access to the underlying file system. A File Object represents a disk file, a Folder Object represents a directory or folder.

- The `Folder` object supports file system functionality such as traversing the hierarchy; creating, renaming or removing files; or resolving file aliases.
- The `File` object supports input/output functions to read or write files.

There are several ways to distinguish between a `File` and a `Folder` object. For example:

```
if (f instanceof File) ...
if (typeof f.open == "undefined") ...// Folders do not open
```

`File` and `Folder` objects can be used anywhere that a path name is required, such as in properties and arguments for files and folders. For details about the objects and their properties and methods, see Chapter 7, "File and Folder Object Reference."

Note: When you create two `File` objects that refer to the same disk file, they are treated as distinct objects. If you open one of them for I/O, the operating system may inhibit access from the other object, because the disk file already is open.

Specifying Paths

When creating a `File` or `Folder` object, you can specify a platform-specific path name, or an absolute or relative path in a platform-independent format known as *universal resource identifier* (*URI*) notation. The path stored in the object is always an absolute, full path name that points to a fixed location on the disk.

- Use the `toString` method to obtain the name of the file or folder as string containing an absolute path name in URI notation.
- Use the fsName property to obtain the platform-specific file name.

Absolute and relative path names

An absolute path name in URI notation describes the full path from a root directory down to a specific file or folder. It starts with one or two slashes (`/`), and a slash separates path elements. For example, the following describes an absolute location for the file `myFile.jsx`:

```
/dir1/dir2/mydir/myFile.jsx
```

A relative path name in URI notation is appended to the path of the current directory, as stored in the globally-available current property of the `Folder` class. It starts with a folder or file name, or with one of the special names dot (`.`) for the current directory, or dot dot (`..`) for the parent of the current directory. A

slash (/) separates path elements. For example, the following paths describe various relative locations for the file myFile.jsx:

myFile.jsx ./myFile.jsx	In the current directory.
../myFile.jsx	In the parent of the current directory.
../../myFile.jsx	In the grandparent of the current directory.
../dir1/myFile.jsx	In dir1, which is parallel to the current directory.

Relative path names are independent of different volume names on different machines and operating systems, and therefore make your code considerably more portable. You can, for example, use an absolute path for a single operation, to set the current directory in the Folder.current property, and use relative paths for all other operations. You would then need only a single code change to update to a new platform or file location.

Character interpretation in paths

There are some platform differences in how pathnames are interpreted:

- In Windows and Mac OS, path names are not case sensitive. In UNIX, paths are case sensitive.
- In Windows, both the slash (/) and the backslash (\) are valid path element separators.
- In Mac OS, both the slash (/) and the colon (:) are valid path element separators.

If a path name starts with two slashes (or backslashes in Windows), the first element refers to a remote server. For example, //myhost/mydir/myfile refers to the path /mydir/myfile on the server myhost.

URI notation allows special characters in pathnames, but they must specified with an escape character (%) followed by a hexadecimal character code. Special characters are those which are not alphanumeric and not one of the characters:

```
/ - — . ! ~ * ' ( )
```

A space, for example, is encoded as %20, so the file name "my file" is specified as "my%20file". Similarly, the character ä is encoded as %E4, so the file name "Bräun" is specified as "Br%E4un".

This encoding scheme is compatible with the global JavaScript functions encodeURI and decodeURI.

The home directory

A path name can start with a tilde (~) to indicate the user's home directory. It corresponds to the platform's HOME environment variable.

UNIX and Mac OS assign the HOME environment variable according to the user login. In Mac OS, the default home directory is /Users/*username*. In UNIX, it is typically /home/*username* or /users/*username*. Extend Script assigns the home directory value directly from the platform value.

In Windows, the HOME environment variable is optional. If it is assigned, its value must be a Windows path name or a path name referring to a remote server (such as \\myhost\mydir). If the HOME environment variable is undefined, the Extend Script default is the user's home directory, usually the C:\Documents and Settings*username* folder.

Note: A script can access many of the folders that are specified with platform-specific variables through static, globally-available Folder class properties; for instance, appData contains the folder that stores application data for all users.

Volume and drive names

A volume or drive name can be the first part of an absolute path in URI notation. The values are interpreted according to the platform.

Mac OS volumes

When Mac OS X starts, the startup volume is the root directory of the file system. All other volumes, including remote volumes, are part of the `/Volumes` directory. The `File` and `Folder` objects use these rules to interpret the first element of a path name:

- If the name is the name of the startup volume, discard it.
- If the name is a volume name, prepend `/Volumes`.
- Otherwise, leave the path as is.

Mac OS 9 is not supported as an operating system, but the use of the colon as a path separator is still supported and corresponds to URI and to Mac OS X paths as shown in the following table. These examples assume that the startup volume is `MacOSX`, and that there is a mounted volume `Remote`.

URI path name	Mac OS 9 path name	Mac OS X path name
`/MacOSX/dir/file`	`MacOSX:dir:file`	`/dir/file`
`/Remote/dir/file`	`Remote:dir:file`	`/Volumes/Remote/dir/file`
`/root/dir/file`	`Root:dir:file`	`/root/dir/file`
`~/dir/file`		`/Users/jdoe/dir/file`

Windows drives

In Windows, volume names correspond to drive letters. The URI path `/c/temp/file` normally translates to the Windows path `C:\temp\file`.

If a drive exists with a name matching the first part of the path, that part is always interpreted as that drive. It is possible for there to be a folder in the root that has the same name as the drive; imagine, for example, a folder `C:\C` in Windows. A path starting with `/c` always addresses the drive `C:`, so in this case, to access the folder by name, you must use both the drive name and the folder name, for example `/c/c` for `C:\C`.

If the current drive contains a root folder with the same name as another drive letter, that name is considered to be a folder. That is, if there is a folder `D:\C`, and if the current drive is `D:`, the URI path `/c/temp/file` translates to the Windows path `D:\c\temp\file`. In this case, to access drive C, you would have to use the Windows path name conventions.

To access a remote volume, use a uniform naming convention (UNC) path name of the form `//servername/sharename`. These path names are portable, because both Max OS X and UNIX ignore multiple slash characters. Note that in Windows, UNC names do *not* work for local volumes.

These examples assume that the current drive is `D:`

URI path name	Windows path name
/c/dir/file	c:\dir\file
/remote/dir/file	D:\remote\dir\file
/root/dir/file	D:\root\dir\file
~/dir/file	C:\Documents and Settings\jdoe\dir\file

Aliases

When you access an alias, the operation is transparently forwarded to the real file. The only operations that affect the alias are calls to `rename` and `remove`, and setting properties `readonly` and `hidden`. When a `File` object represents an alias, the `alias` property of the object returns `true`, and the `resolve` method returns the `File` or `Folder` object for the target of the alias.

In Windows, all file system aliases (called *shortcuts*) are actual files whose names end with the extension `.lnk`. Never use this extension directly; the `File` and `Folder` objects work without it.

For example, suppose there is a shortcut to the file `/folder1/some.txt` in the folder `/folder2`. The full Windows file name of the shortcut file is `\folder2\some.txt.lnk`.

To access the shortcut from a `File` object, specify the path `/folder2/some.txt`. Calling that `File` object's `open` method opens the linked file (in `/folder1`). Calling the `File` object's `rename` method renames the shortcut file itself (leaving the `.lnk` extension intact).

However, Windows permits a file and its shortcut to reside in the same folder. In this case, the `File` object always accesses the original file. You cannot create a `File` object to access the shortcut when it is in the same folder as its linked file.

A script can create a file alias by creating a `File` object for a file that does not yet exist on disk, and using its createAlias method to specify the target of the alias.

Portability issues

If your application will run on multiple platforms, use relative path names, or try to originate path names from the home directory. If that is not possible, work with Mac OS X and UNIX aliases, and store your files on a machine that is remote to your Windows machine so that you can use UNC names.

As an example, suppose you use the UNIX machine `myServer` for data storage. If you set up an alias share in the root directory of `myServer`, and if you set up a Windows-accessible share at `share` pointing to the same data location, the path name `//myServer/share/file` would work for all three platforms.

Unicode I/O

When doing file I/O, Adobe applications convert 8-bit character encoding to Unicode. By default, this conversion process assumes that the system encoding is used (code page 1252 in Windows or Mac Roman in Mac OS). The `encoding` property of a `File` object returns the current encoding. You can set the `encoding` property to the name of the desired encoding. The `File` object looks for the corresponding encoder in the operating system to use for subsequent I/O. The name is one of the standard Internet names that are used to describe the encoding of HTML files, such as `ASCII`, `X-SJIS`, or `ISO-8859-1`. For a complete list, see File and Folder Supported Encoding Names.

A special encoder, `BINARY`, is provided for binary I/O. This encoder simply extends every 8-bit character it finds to a Unicode character between 0 and 255. When using this encoder to write binary files, the encoder writes the lower 8 bits of the Unicode character. For example, to write the Unicode character `1000`, which is 0x3E8, the encoder actually writes the character 232 (0xE8).

The data of some of the common file formats (UCS-2, UCS-4, UTF-8, UTF-16) starts with a special byte order mark (BOM) character (`\uFEFF`). The `File.open` method reads a few bytes of a file looking for this character. If it is found, the corresponding encoding is set automatically and the character is skipped. If there is no BOM character at the beginning of the file, `open()` reads the first 2 KB of the file and checks whether the data might be valid UTF-8 encoded data, and if so, sets the encoding to UTF-8.

To write 16-bit Unicode files in UTF-16 format, use the encoding UCS-2. This encoding uses whatever byte-order format the host platform supports.

When using UTF-8 encoding or 16-bit Unicode, always write the BOM character "`\uFEFF`" as the first character of the file.

File Error Handling

Each object has an `error` property. If accessing a property or calling a method causes an error, this property contains a message describing the type of the error. On success, the property contains the empty string. You can set the property, but setting it only causes the error message to be cleared. If a file is open, assigning an arbitrary value to the property also resets its error flag.

For a complete list of supported error messages, see File and Folder Error Messages.

7 File and Folder Object Reference

Overview

Because path name syntax is very different in Windows, Mac OS and UNIX, the `File` and `Folder` objects are defined to provide platform-independent access to the underlying file system. A `File` object is associated with a disk file, a `Folder` object with a directory or folder.

- The `Folder` object supports file-system functionality such as traversing the hierarchy, creating, renaming or removing files, or resolving file aliases.
- The `File` object supports I/O functions to read or write files.

`File` and `Folder` objects can be used anywhere a path name is required, such as in properties and arguments for files and folders.

For a description of the pathname syntax and object usage, see Chapter 6, "Using File and Folder Objects." This chapter provides detail about the classes and objects, their properties and methods, and the supported encoding names:

- File Object
- Folder Object
- File and Folder Error Messages
- File and Folder Supported Encoding Names

File Object

Represents a file in the local file system in an platform-independent manner. All properties and methods resolve file system aliases automatically and act on the original file unless otherwise noted.

File object constructors

To create a `File` object, use the `File` function or the `new` operator. The constructor accepts full or partial path names, and returns the new object. The CRLF sequence for the file is preset to the system default, and the encoding is preset to the default system encoding.

```
File ([path]); //can return a Folder object
new File ([path]); //always returns a File object
```

path	Optional. The absolute or relative path to the file associated with this object, specified in platform-specific or URI format; see Specifying Paths. The value stored in the object is the absolute path. The path need not refer to an existing file. If not supplied, a temporary name is generated. If the path refers to an existing folder: • The `File` function returns a `Folder` object instead of a `File` object. • The `new` operator returns a `File` object for a nonexisting file with the same name.

File class properties

This property is available as a static property of the `File` class. It is not necessary to create an instance to access it.

`fs`	String	The name of the file system. Read-only. One of `Windows`, `Macintosh`, or `Unix`.

File class functions

These functions are available as static methods of the `File` class. It is not necessary to create an instance to call them.

`decode` `File.decode (`*`what`*`)`	Decodes the specified string as required by RFC 2396 and returns the decoded string.
`what`	String. The encoded string to decode. All special characters must be encoded in UTF-8 and stored as escaped characters starting with the percent sign followed by two hexadecimal digits. For example, the string "`my%20file`" is decoded as "`my file`". Special characters are those with a numeric value greater than 127, except the following: `/ - _ . ! ~ * ' ( )`
`encode` `File.encode (`*`what`*`)`	Encodes the specified string as required by RFC 2396 and returns the encoded string. All special characters are encoded in UTF-8 and stored as escaped characters starting with the percent sign followed by two hexadecimal digits. For example, the string "`my file`" is encoded as "`my%20file`". Special characters are those with a numeric value greater than 127, except the following: `/ - _ . ! ~ * ' ( )`
`what`	String. The string to encode.
`isEncodingAvailable` `File.isEncodingAvailable (`*`name`*`)`	Returns `true` if your system supports the specified encoding, `false` otherwise.
`name`	String. The encoding name.

openDialog

```
File.openDialog
  ([prompt][,select])
```

Opens the built-in platform-specific file-browsing dialog in which a user can select an existing file to open.

If the user clicks **OK**, returns a `File` object for the selected file. If the user cancels, returns `null`.

prompt Optional. A string containing the prompt text, if the dialog allows a prompt.

select Optional. A file or files to be preselected when the dialog opens:

- In Windows, a string containing a comma-separated list of file types with descriptive text, to be displayed in the bottom of the dialog as a drop-down list from which the user can select which types of files to display.

  Each element starts with the descriptive text, followed by a colon and the file search masks for this text, separated by semicolons. For example, to display two choices, one labeled **Text Files** that allows selection of text files with extensions `.TXT` and `.DOC`, and the other labeled **All files** that allows selection of all files:

  ```
  Text Files:*.TXT;*.DOC,All files:*
  ```

- In Mac OS, a string containing the name of a function defined in the current JavaScript scope that takes a `File` object argument. The function is called for each file about to be displayed in the dialog, and the file is displayed only when the function returns `true`.

saveDialog

```
File.saveDialog
  ([prompt][,select])
```

Opens the built-in platform-specific file-browsing dialog in which a user can select an existing file location to which to save this file.

If the user clicks **OK**, returns a `File` object for the selected file, and overwrites the existing file. If the user cancels, returns `null`.

prompt Optional. A string containing the prompt text, if the dialog allows a prompt.

select Optional. A file or files to be preselected when the dialog opens:

- In Windows, a string containing a comma-separated list of file types with descriptive text, to be displayed in the bottom of the dialog as a drop-down list from which the user can select which types of files to display.

  Each element starts with the descriptive text, followed by a colon and the file search masks for this text, separated by semicolons. For example, to display two choices, one labeled **Text Files** that allows selection of text files with extensions `.TXT` and `.DOC`, and the other labeled **All files** that allows selection of all files:

  ```
  Text Files:*.TXT;*.DOC,All files:*
  ```

- In Mac OS, a string containing the name of a function defined in the current JavaScript scope that takes a `File` object argument. The function is called for each file about to be displayed in the dialog, and the file is displayed only when the function returns `true`.

File object properties

These properties are available for `File` objects.

absoluteURI	String	The full path name for the referenced file in URI notation. Read-only.
alias	Boolean	When `true`, the object refers to a file system alias or shortcut. Read-only.
created	Date	The creation date of the referenced file, or `null` if the object does not refer to a file on disk. Read-only.
creator	String	The Mac OS file creator as a four-character string. In Windows or UNIX, value is `"????"`. Read-only.
encoding	String	Gets or sets the encoding for subsequent read/write operations. One of the encoding constants listed in File and Folder Supported Encoding Names. If the value is not recognized, uses the system default encoding. A special encoder, `BINARY`, is used to read binary files. It stores each byte of the file as one Unicode character regardless of any encoding. When writing, the lower byte of each Unicode character is treated as a single byte to write.
eof	Boolean	When `true`, a read attempt caused the current position to be beyond the end of the file, or the file is not open. Read only.
error	String	A message describing the last file system error; see File and Folder Error Messages. Setting this value clears any error message and resets the error bit for opened files.
exists	Boolean	When `true`, the path name of this object refers to an existing file. Read only.
fsName	String	The platform-specific name of the referenced file as a full path name. Read-only.
hidden	Boolean	When `true`, the file is not shown in the platform-specific file browser. Read/write. If the object references a file-system alias or shortcut, the flag is altered on the alias, not on the original file.
length	Number	The size of the file in bytes. Can be set only for a file that is not open, in which case it truncates or pads the file with 0-bytes to the new length.
lineFeed	String	How line feed characters are written. One of: `windows`: Windows style `mac`: Mac OS style `unix`: UNIX style
modified	Date	The date of the referenced file's last modification, or `null` if the object does not refer to a file on disk. Read-only.
name	String	The name of the referenced file without the path specification. Read-only.
parent	Folder	The `Folder` object for the folder that contains this file. Read-only.

path	String	The path portion of the absolute URI, or the empty string If the name does not have a path. Read-only.
readonly	Boolean	When `true`, prevents the file from being altered or deleted. If the referenced file is a file-system alias or shortcut, the flag is altered on the alias, not on the original file.
relativeURI	String	The path name for the referenced file in URI notation, relative to the current folder. Read-only.
type	String	The Mac OS file type as a four-character string. In Windows and UNIX, the value is "????". Read-only.

File object functions

These functions are available for `File` objects.

close *fileObj*`.close ()`	Closes this open file. Returns `true` on success, `false` if there are I/O errors.
copy *fileObj*`.copy (`*target*`)`	Copies this object's referenced file to the specified target location. Resolves any aliases to find the source file. If a file exists at the target location, it is overwritten. Returns `true` if the copy was successful, `false` otherwise.
target	A string with the URI path to the target location, or a `File` object that references the target location.
createAlias *fileObj*`.createAlias (`*toFile*`, [`*isFinderAlias*`])`	Makes this file into a file-system alias or shortcut to the specified file. The referenced file for this object must exist on disk. Returns `true` if the operation was successful, `false` otherwise.
toFile	The `File` object for the target of the new alias.
isFinderAlias	Optional, Mac OS only. When `true`, the alias is created as a legacy Finder alias. When `false` (the default), the alias is created as a Unix symlink.
execute *fileObj*`.execute ()`	Opens this file using the appropriate application (as if it had been double-clicked in a file browser). You can use this method to run scripts, launch applications, and so on. Returns `true` immediately if the application launch was successful.
getRelativeURI *fileObj*`.getRelativeURI ([`*basePath*`])`	Returns a string containing the URI for this file or folder relative to the specified base path, in URI notation. If no base path is supplied, returns the URI relative to the path of the current folder.
basePath	Optional. A string containing the base path for the relative URI. Default is the current folder.

open

fileObj.open (*mode*[,*type*][,*creator*])

Open the file for subsequent read/write operations. The method resolves any aliases to find the file. Returns `true` if the file has been opened successfully, `false` otherwise.

The method attempts to detect the encoding of the open file. It reads a few bytes at the current location and tries to detect the Byte Order Mark character `0xFFFE`. If found, the current position is advanced behind the detected character and the encoding property is set to one of the strings `UCS-2BE`, `UCS-2LE`, `UCS4-BE`, `UCS-4LE`, or `UTF-8`. If the marker character is not found, it checks for zero bytes at the current location and makes an assumption about one of the above formats (except UTF-8). If everything fails, the `encoding` property is set to the system encoding.

Note: Be careful about opening a file more than once. The operating system usually permits you to do so, but if you start writing to the file using two different `File` objects, you can destroy your data.

mode	A string indicating the read/write mode. One of: `r`: (read) Opens for reading. If the file does not exist or cannot be found, the call fails. `w`: (write) Opens a file for writing. If the file exists, its contents are destroyed. If the file does not exist, creates a new, empty file. `e`: (edit) Opens an existing file for reading and writing.
type	Optional. In Mac OS, the type of a newly created file, a 4-character string. Ignored in Windows and UNIX.
creator	Optional. In Mac OS, the creator of a newly created file, a 4-character string. Ignored in Windows and UNIX.

openDlg
fileObj.OpenDlg ([*prompt*][,*select*])

Opens the built-in platform-specific file-browsing dialog, in which the user can select an existing file to open. If the user clicks **OK**, returns a File or Folder object for the selected file or folder. If the user cancels, returns null.

Differs from the class method openDialog() in that it presets the current folder to this File object's parent folder and the current file to this object's associated file.

prompt Optional. A string containing the prompt text, if the dialog allows a prompt.

select Optional. A file or files to be preselected when the dialog opens:

- In Windows, a string containing a comma-separated list of file types with descriptive text, to be displayed in the bottom of the dialog as a drop-down list from which the user can select which types of files to display.

  Each element starts with the descriptive text, followed by a colon and the file search masks for this text, separated by semicolons. For example, to display two choices, one labeled **Text Files** that allows selection of text files with extensions .TXT and .DOC, and the other labeled **All files** that allows selection of all files:

  ```
  Text Files:*.TXT;*.DOC,All files:*
  ```

- In Mac OS, a string containing the name of a function defined in the current JavaScript scope that takes a File object argument. The function is called for each file about to be displayed in the dialog, and the file is displayed only when the function returns true.

read
fileObj.read ([*chars*])

Reads the contents of the file starting at the current position, and returns a string that contains up to the specified number of characters.

chars Optional. An integer specifying the number of characters to read. By default, reads from the current position to the end of the file. If the file is encoded, multiple bytes might be read to create single Unicode characters.

readch
fileObj.readch ()

Reads a single text character from the file at the current position, and returns it in a string. Line feeds are recognized as CR, LF, CRLF, or LFCR pairs. If the file is encoded, multiple bytes might be read to create single Unicode characters.

readln
fileObj.readln ()

Reads a single line of text from the file at the current position, and returns it in a string. Line feeds are recognized as CR, LF, CRLF, or LFCR pairs. If the file is encoded, multiple bytes might be read to create single Unicode characters.

remove
fileObj.remove ()

Deletes the file associated with this object from disk, immediately, without moving it to the system trash. Returns true if the file is deleted successfully.

Does not resolve aliases; instead, deletes the referenced alias or shortcut file itself.

Note: Cannot be undone. It is recommended that you prompt the user for permission before deleting.

rename
fileObj.rename (*newName*)

Renames the associated file. Returns `true` on success.

Does not resolve aliases, but renames the referenced alias or shortcut file itself.

newName The new file or folder name, with no path.

resolve
fileObj.resolve ()

If this object references an alias or shortcut, this method resolves that alias and returns a new `File` object that references the file-system element to which the alias resolves.

Returns `null` if this object does not reference an alias, or if the alias cannot be resolved.

saveDlg
fileObj.saveDlg ([*prompt*] [,*preset*])

Opens the built-in platform-specific file-browsing dialog, in which the user can select an existing file location at which to save this file. If the user clicks **OK**, returns a `File` or `Folder` object for the selected file or folder. If the user cancels, returns `null`.

Differs from the class method `saveDialog()` in that it presets the current folder to this `File` object's parent folder and the file to this object's associated file, and prompts the user to confirm before overwriting an existing file.

prompt Optional. A string containing the prompt text, if the dialog allows a prompt.

preset Optional. A file or files to be preselected when the dialog opens:

- In Windows, a string containing a comma-separated list of file types with descriptive text, to be displayed in the bottom of the dialog as a drop-down list from which the user can select which types of files to display.

  Each element starts with the descriptive text, followed by a colon and the file search masks for this text, separated by semicolons. For example, to display two choices, one labeled **Text Files** that allows selection of text files with extensions `.TXT` and `.DOC`, and the other labeled **All files** that allows selection of all files:

  ```
  Text Files:*.TXT;*.DOC,All files:*
  ```

- In Mac OS, a string containing the name of a function defined in the current JavaScript scope that takes a `File` object argument. The function is called for each file about to be displayed in the dialog, and the file is displayed only when the function returns `true`.

seek
fileObj.seek (*pos*, *mode*)

Seeks to the specified position in the file, and returns `true` if the position was changed. The new position cannot be less than 0 or greater than the current file size.

pos The new current position in the file as an offset in bytes from the start, current position, or end, depending on the `mode`.

mode The seek mode, one of:

0: Seek to absolute position, where `pos=0` is the first byte of the file.
1: Seek relative to the current position.
2. Seek backward from the end of the file.

tell
fileObj.tell ()

Returns the current position as a byte offset from the start of the file.

write *fileObj*.write (*text*[, *text*...]...)	Writes the specified text to the file at the current position. Returns `true` on success. For encoded files, writing a single Unicode character may write multiple bytes. **Note:** Be careful not to write to a file that is open in another application or object, as this can overwrite existing data.
text	One or more strings to write, which are concatenated to form a single string.
writeln *fileObj*.writeln (*text*[, *text*...]...)	Writes the specified text to the file at the current position, and appends a Line Feed sequence in the style specified by the `linefeed` property. Returns `true` on success. For encoded files, writing a single Unicode character may write multiple bytes. **Note:** Be careful not to write to a file that is open in another application or object, as this can overwrite existing data.
text	One or more strings to write, which are concatenated to form a single string.

Folder Object

Represents a file-system folder or directory in a platform-independent manner. All properties and methods resolve file system aliases automatically and act on the original file unless otherwise noted.

Folder object constructors

To create a `Folder` object, use the `Folder` function or the `new` operator. The constructor accepts full or partial path names, and returns the new object.

```
Folder ([path]); //can return a File object
new Folder ([path]); //always returns a Folder object
```

path	Optional. The absolute or relative path to the folder associated with this object, specified in URI format; see Specifying Paths. The value stored in the object is the absolute path. The path need not refer to an existing folder. If not supplied, a temporary name is generated. If the path refers to an existing file: • The `Folder` function returns a `File` object instead of a `Folder` object. • The `new` operator returns a `Folder` object for a nonexisting folder with the same name.

Folder class properties

These properties are available as static properties of the `Folder` class. It is not necessary to create an instance to access them.

appData	Folder	A `Folder` object for the folder that contains application data for all users. Read-only. • In Windows, the value of `%APPDATA%` (by default, `C:\Documents and Settings\All Users\Application Data`) • In Mac OS, `/Library/Application Support`
commonFiles	Folder	A `Folder` object for the folder that contains files common to all programs. Read-only. • In Windows, the value of `%CommonProgramFiles%` (by default, `C:\Program Files\Common Files`) • In Mac OS,`/Library/Application Support`
current	Folder	A `Folder` object for the current folder. Assign either a `Folder` object or a string containing the new path name to set the current folder.
fs	String	The name of the file system. Read-only. One of `Windows`, `Macintosh`, or `Unix`.
myDocuments	Folder	A `Folder` object for the default document folder. Read-only. • In Windows, `C:\Documents and Settings\`*username*`\My Documents` • In Mac OS, `~/Documents`
startup	Folder	A `Folder` object for the folder containing the executable image of the running application. Read-only.

system	Folder	A `Folder` object for the folder containing the operating system files. Read-only. • In Windows, the value of `%windir%` (by default, `C:\Windows`) • In Mac OS, `/System`
temp	Folder	A `Folder` object for the default folder for temporary files. Read-only.
trash	Folder	A `Folder` object for the folder containing deleted items. Read-only.
userData	Folder	A `Folder` object for the folder that contains application data for the current user. Read-only. • In Windows, the value of `%APPDATA%` (by default, `C:\Documents and Settings\`*`username`*`\Application Data`) • In Mac OS, `~/Library/Application Support`

Folder class functions

These functions are available as a static methods of the `Folder` class. It is not necessary to create an instance in order to call them.

decode
`Folder.decode (`*`what`*`)`

Decodes the specified string as required by RFC 2396 and returns the decoded string.

what — String. The encoded string to decode.

All special characters must be encoded in UTF-8 and stored as escaped characters starting with the percent sign followed by two hexadecimal digits. For example, the string "`my%20file`" is decoded as "`my file`".

Special characters are those with a numeric value greater than 127, except the following:

`/ - _ . ! ~ * ' ( )`

encode
`Folder.encode (`*`what`*`)`

Encodes the specified string as required by RFC 2396 and returns the encoded string.

All special characters are encoded in UTF-8 and stored as escaped characters starting with the percent sign followed by two hexadecimal digits. For example, the string "`my file`" is encoded as "`my%20file`".

Special characters are those with a numeric value greater than 127, except the following:

`/ - _ . ! ~ * ' ( )`

what — String. The string to encode.

isEncodingAvailable
`File.isEncodingAvailable (`*`name`*`)`

Returns `true` if your system supports the specified encoding, `false` otherwise.

name — String. The encoding name.

selectDialog `Folder.selectDialog ([prompt] [,preset])`	Opens the built-in platform-specific file-browsing dialog. If the user clicks **OK**, returns a `Folder` object for the selected folder. If the user cancels, returns `null`. Differs from the object method `selectDlg()` in that it does not preselect a folder.
prompt	Optional. A string containing the prompt text, if the dialog allows a prompt.
preset	Optional. A `Folder` object for a folder to be preselected when the dialog opens.

Folder object properties

These properties are available for `Folder` objects.

absoluteURI	String	The full path name for the referenced folder in URI notation. Read-only.
alias	Boolean	When `true`, the object refers to a file system alias or shortcut. Read-only.
created	Date	The creation date of the referenced folder, or `null` if the object does not refer to a folder on disk. Read-only.
error	String	A message describing the last file system error; see File and Folder Error Messages. Setting this value clears any error message and resets the error bit for opened folders.
exists	Boolean	When `true`, the path name of this object refers to an existing folder. Read only.
fsName	String	The platform-specific name of the referenced folder as a full path name. Read-only.
modified	Date	The date of the referenced folder's last modification, or `null` if the object does not refer to a folder on disk. Read-only.
name	String	The name of the referenced folder without the path specification. Read-only.
parent	Folder	The `Folder` object for the folder that contains this folder, or `null` if this object refers to the root folder of a volume. Read-only.
path	String	The path portion of the absolute URI, or the empty string If the name does not have a path. Read-only.
relativeURI	String	The path name for the referenced folder in URI notation, relative to the current folder. Read-only.

Folder object functions

These functions are available for `Folder` objects.

`create` *`folderObj`*`.create ()`	Creates a folder at the location to which the path name points. Returns `true` if the folder was created successfully.
`execute` *`folderObj`*`.execute ()`	Opens this folder in the file browser (as if it had been double-clicked in a file browser). Returns `true` immediately if the folder was opened successfully.
`getFiles` *`folderObj`*`.getFiles ([`*`mask`*`])`	Returns an array of `File` and `Folder` objects for the contents of this folder, filtered by the supplied `mask`, or `null` if this object's referenced folder does not exist.
`mask`	Optional. A search mask for file names. A string that can contain question mark (`?`) and asterisk (`*`) wild cards. Default is `"*"`, which matches all file names. Can also be the name of a function that takes a `File` or `Folder` object as its argument. It is called for each file or folder found in the search; if it returns `true`, the object is added to the return array. **Note:** In Windows, all aliases end with the extension `.lnk`, which is stripped from the file name when found to preserve compatibility with other operating systems. You can search for all aliases by supplying the search mask `"*.lnk"`, but note that such code is not portable.
`getRelativeURI` *`folderObj`*`.getRelativeURI ([`*`basePath`*`])`	Returns a string containing the URI for this folder relative to the specified base path, in URI notation. If no base path is supplied, returns the URI relative to the path of the current folder.
`basePath`	Optional. A string containing the base path for the relative URI. Default is the current folder.
`remove` *`folderObj`*`.remove ()`	Deletes the empty folder associated with this object from disk, immediately, without moving it to the system trash. Returns `true` if the folder is deleted successfully. • Folders must be empty before they can be deleted. • Does not resolve aliases; instead, deletes the referenced alias or shortcut file itself. **Note:** Cannot be undone. It is recommended that you prompt the user for permission before deleting.
`rename` *`folderObj`*`.rename (`*`newName`*`)`	Renames the associated folder. Returns `true` on success. • Does not resolve aliases; instead, renames the referenced alias or shortcut file itself.
`newName`	The new folder name, with no path.
`resolve` *`folderObj`*`.resolve ()`	If this object references an alias or shortcut, this method resolves that alias and returns a new `Folder` object that references the file-system element to which the alias resolves. Returns `null` if this object does not reference an alias, or if the alias cannot be resolved.

selectDlg *folderObj*.selectDlg ([*prompt*][,*preset*])	Opens the built-in platform-specific file-browsing dialog. If the user clicks **OK**, returns a `File` or `Folder` object for the selected file or folder. If the user cancels, returns `null`. Differs from the class method `selectDialog()` in that it preselects this folder.
prompt	Optional. A string containing the prompt text, if the dialog allows a prompt.
preset	Optional. A `Folder` object for a folder to be preselected when the dialog opens.

File and Folder Error Messages

The following messages can be returned in the `error` property.

`File or folder does not exist`	The file or folder does not exist, but the parent folder exists.
`File or folder already exists`	The file or folder already exists.
`I/O device is not open`	An I/O operation was attempted on a file that was closed.
`Read past EOF`	Attempt to read beyond the end of a file.
`Conversion error`	The content of the file cannot be converted to Unicode.
`Partial multibyte character found`	The character encoding of the file data has errors.
`Permission denied`	The OS did not allow the attempted operation.
`Cannot change directory`	Cannot change the current folder.
`Cannot create`	Cannot create a folder.
`Cannot rename`	Cannot rename a file or folder.
`Cannot delete`	Cannot delete a file or folder.
`I/O error`	Unspecified I/O error.
`Cannot set size`	Setting the file size failed.
`Cannot open`	Opening of a file failed.
`Cannot close`	Closing a file failed.
`Read error`	Reading from a file failed.
`Write error`	Writing to a file failed.
`Cannot seek`	Seek failure.
`Cannot execute`	Unable to execute the specified file.

File and Folder Supported Encoding Names

The following list of names is a basic set of encoding names supported by the `File` object. Some of the character encoders are built in, while the operating system is queried for most of the other encoders. Depending on the language packs installed, some of the encodings may not be available. Names that refer to the same encoding are listed in one line. Underlines are replaced with dashes before matching an encoding name.

The `File` object processes an extended Unicode character with a value greater that 65535 as a Unicode surrogate pair (two characters in the range between 0xD700-0xDFFF).

Built-in encodings are:

```
US-ASCII, ASCII,ISO646-US,I SO-646.IRV:1991, ISO-IR-6,
ANSI-X3.4-1968,CP367,IBM367,US,ISO646.1991-IRV
UCS-2,UCS2, ISO-10646-UCS-2
UCS2LE,UCS-2LE,ISO-10646-UCS-2LE
UCS2BE,UCS-2BE,ISO-10646-UCS-2BE
UCS-4,UCS4, ISO-10646-UCS-4
UCS4LE,UCS-4LE,ISO-10646-UCS-4LE
UCS4BE,UCS-4BE,ISO-10646-UCS-4BE
UTF-8,UTF8,UNICODE-1-1-UTF-8,UNICODE-2-0-UTF-8,X-UNICODE-2-0-UTF-8
UTF16,UTF-16,ISO-10646-UTF-16
UTF16LE,UTF-16LE,ISO-10646-UTF-16LE
UTF16BE,UTF-16BE,ISO-10646-UTF-16BE
CP1252,WINDOWS-1252,MS-ANSI
ISO-8859-1,ISO-8859-1,ISO-8859-1:1987,ISO-IR-100,LATIN1
MACINTOSH,X-MAC-ROMAN
BINARY
```

The ASCII encoder raises errors for characters greater than 127, and the BINARY encoder simply converts between bytes and Unicode characters by using the lower 8 bits. The latter encoder is convenient for reading and writing binary data.

Additional encodings

In Windows, all encodings use code pages, which are assigned numeric values. The usual Western character set that Windows uses, for example, is the code page 1252. You can select Windows code pages by prepending the number of the code page with "CP" or "WINDOWS": for example, "CP1252" for the code page 1252. The `File` object has many other built-in encoding names that match predefined code page numbers. If a code page is not present, the encoding cannot be selected.

In Mac OS, you can select encoders by name rather than by code page number. The `File` object queries Mac OS directly for an encoder. As far as Mac OS character sets are identical with Windows code pages, Mac OS also knows the Windows code page numbers.

In UNIX, the number of available encoders depends on the installation of the `iconv` library.

Common encoding names

The following encoding names are implemented both in Windows and in Mac OS:

```
UTF-7,UTF7,UNICODE-1-1-UTF-7,X-UNICODE-2-0-UTF-7
ISO-8859-2,ISO-8859-2,ISO-8859-2:1987,ISO-IR-101,LATIN2
ISO-8859-3,ISO-8859-3,ISO-8859-3:1988,ISO-IR-109,LATIN3
ISO-8859-4,ISO-8859-4,ISO-8859-4:1988,ISO-IR-110,LATIN4,BALTIC
ISO-8859-5,ISO-8859-5,ISO-8859-5:1988,ISO-IR-144,CYRILLIC
ISO-8859-6,ISO-8859-6,ISO-8859-6:1987,ISO-IR-127,ECMA-114,ASMO-708,ARABIC
ISO-8859-7,ISO-8859-7,ISO-8859-7:1987,ISO-IR-126,ECMA-118,ELOT-928,GREEK8,GREEK
ISO-8859-8,ISO-8859-8,ISO-8859-8:1988,ISO-IR-138,HEBREW
```

```
ISO-8859-9,ISO-8859-9,ISO-8859-9:1989,ISO-IR-148,LATIN5,TURKISH
ISO-8859-10,ISO-8859-10,ISO-8859-10:1992,ISO-IR-157,LATIN6
ISO-8859-13,ISO-8859-13,ISO-IR-179,LATIN7
ISO-8859-14,ISO-8859-14,ISO-8859-14,ISO-8859-14:1998,ISO-IR-199,LATIN8
ISO-8859-15,ISO-8859-15,ISO-8859-15:1998,ISO-IR-203
ISO-8859-16,ISO-885,ISO-885,MS-EE
CP850,WINDOWS-850,IBM850
CP866,WINDOWS-866,IBM866
CP932,WINDOWS-932,SJIS,SHIFT-JIS,X-SJIS,X-MS-SJIS,MS-SJIS,MS-KANJI
CP936,WINDOWS-936,GBK,WINDOWS-936,GB2312,GB-2312-80,ISO-IR-58,CHINESE
CP949,WINDOWS-949,UHC,KSC-5601,KS-C-5601-1987,KS-C-5601-1989,ISO-IR-149,KOREAN
CP950,WINDOWS-950,BIG5,BIG-5,BIG-FIVE,BIGFIVE,CN-BIG5,X-X-BIG5
CP1251,WINDOWS-1251,MS-CYRL
CP1252,WINDOWS-1252,MS-ANSI
CP1253,WINDOWS-1253,MS-GREEK
CP1254,WINDOWS-1254,MS-TURK
CP1255,WINDOWS-1255,MS-HEBR
CP1256,WINDOWS-1256,MS-ARAB
CP1257,WINDOWS-1257,WINBALTRIM
CP1258,WINDOWS-1258
CP1361,WINDOWS-1361,JOHAB
EUC-JP,EUCJP,X-EUC-JP
EUC-KR,EUCKR,X-EUC-KR
HZ,HZ-GB-2312
X-MAC-JAPANESE
X-MAC-GREEK
X-MAC-CYRILLIC
X-MAC-LATIN
X-MAC-ICELANDIC
X-MAC-TURKISH
```

Additional Windows encoding names

```
CP437,IBM850,WINDOWS-437
CP709,WINDOWS-709,ASMO-449,BCONV4
EBCDIC
KOI-8R
KOI-8U
ISO-2022-JP
ISO-2022-KR
```

Additional Mac OS encoding names

These names are alias names for encodings that Mac OS might know.

```
TIS-620,TIS620,TIS620-0,TIS620.2529-1,TIS620.2533-0,TIS620.2533-1,ISO-IR-166
CP874,WINDOWS-874
JP,JIS-C6220-1969-RO,ISO646-JP,ISO-IR-14
JIS-X0201,JISX0201-1976,X0201
JIS-X0208,JIS-X0208-1983,JIS-X0208-1990,JIS0208,X0208,ISO-IR-87
JIS-X0212,JIS-X0212.1990-0,JIS-X0212-1990,X0212,ISO-IR-159
CN,GB-1988-80,ISO646-CN,ISO-IR-57
ISO-IR-16,CN-GB-ISOIR165
KSC-5601,KS-C-5601-1987,KS-C-5601-1989,ISO-IR-149
EUC-CN,EUCCN,GB2312,CN-GB
EUC-TW,EUCTW,X-EUC-TW
```

UNIX encodings

In UNIX, the `File` object looks for the presence of the `iconv` library, and uses whatever encoding it finds there. If you need a special encoding in UNIX, make sure that there is an `iconv` encoding module installed that converts between UTF-16 (the internal format that the `File` object uses) and the desired encoding.

8 Scripting Constants

This section lists and describes the enumerations defined for use with Adobe Photoshop CS2 JavaScript properties and methods.

Constant type	Values	What it means
AdjustmentReference	ABSOLUTE RELATIVE	Method to use for interpreting selective color adjustment specifications: ABSOLUTE = % of the whole; RELATIVE = % of the existing color amount.
AnchorPosition	BOTTOMCENTER BOTTOMLEFT BOTTOMRIGHT MIDDLECENTER MIDDLELEFT MIDDLERIGHT TOPCENTER TOPLEFT TOPRIGHT	The point on the object that does not move when the object is rotated or resized.
AntiAlias	CRISP NONE SHARP SMOOTH STRONG	Method to use to smooth edges by softening the color transition between edge pixels and background pixels.
AutoKernType	MANUAL METRICS OPTICAL	The type of kerning to use for characters.
BatchDestinationType	FOLDER NODESTINATION SAVEANDCLOSE	The destination, if any, for batch-processed files: FOLDER: Save modified versions of the files to a new location (leaving the originals unchanged); NODESTINATIONTYPE: Leave all files open; SAVEANDCLOSE: Save changes and close the files.
BitmapConversionType	CUSTOMPATTERN DIFFUSIONDITHER HALFTHRESHOLD HALFTONESCREEN PATTERNDITHER	Specifies the quality of an image you are converting to bitmap mode.
BitmapHalfToneType	CROSS DIAMOND ELLIPSE LINE ROUND SQUARE	Specifies the shape of the dots (ink deposits) in the halftone screen.
BitsPerChannelType	EIGHT ONE SIXTEEN THIRTYTWO	The number of bits per color channel.

Constant type	Values	What it means
BlendMode	COLORBLEND COLORBURN COLORDODGE DARKEN DIFFERENCE DISSOLVE EXCLUSION HARDLIGHT HUE LIGHTEN LINEARBURN LINEARDODGE LINEARLIGHT LUMINOSITY MULTIPLY NORMAL OVERLAY PASSTHROUGH PINLIGHT SATURATION SCREEN SOFTLIGHT VIVIDLIGHT	Controls how pixels in the image are blended.
BMPDepthType	BMP_A1R5G5B5 BMP_A4R4G4B4 BMP_A8R8G8B8 BMP_R5G6B5 BMP_R8G8B8 BMP_X1R5G5B5 BMP_X4R4G4B4 BMP_X8R8G8B8 EIGHT FOUR ONE SIXTEEN THIRTYTWO TWENTYFOUR	The number of bits per channel (also called pixel depth or color depth). The number selected indicates the exponent of 2. For example, a pixel with a bit-depth of EIGHT has 2^8, or 256, possible color values.
ByteOrder	IBM MACOS	The order in which bytes will be read.
CameraRAWSettingsType	CAMERA CUSTOM SELECTEDIMAGE	The default CameraRaw settings to use: the camera settings, custom settings, or the settings of the selected image.
CameraRAWSize	EXTRALARGE LARGE MAXIMUM MEDIUM MINIMUM SMALL	The camera RAW size type options: EXTRALARGE=5120 x 1024 LARGE=4096 x 1024 MEDIUM=3072 x 1024 SMALL=2048 x 1024 MINIMUM=1536 x 1024
ChangeMode	BITMAP CMYK GRAYSCALE INDEXEDCOLOR LAB MULTICHANNEL RGB	The type of color mode to use. **Note:** Color images must be changed to GRAYSCALE mode before you can change them to BITMAP mode.

Constant type	Values	What it means
ChannelType	COMPONENT MASKEDAREA SELECTEDAREA SPOTCOLOR	The type of channel: COMPONENT: related to document color mode MASKEDAREA: Alpha channel where color indicates masked area SELECTEDAREA: Alpha channel where color indicates selected are SPOTCOLOR:
ColorBlendMode	BEHIND CLEAR COLOR COLORBURN COLORDODGE DARKEN DIFFERENCE DISSOLVE EXCLUSION HARDLIGHT HUE LIGHTEN LINEARBURN LINEARDODGE LINEARLIGHT LUMINOSITY MULTIPLY NORMAL OVERLAY PINLIGHT SATURATION SCREEN SOFTLIGHT VIVIDLIGHT	Color blend mode type.
ColorModel	CMYK GRAYSCALE HSB LAB NONE RGB	The color model to use.
ColorPicker	ADOBE APPLE PLUGIN WINDOWS	The color picker to use.
ColorProfile	CUSTOM NONE WORKING	The color profile type to use to manage this document.
ColorReductionType	ADAPTIVE BLACKWHITE CUSTOM GRAYSCALE MACINTOSH PERCEPTUAL RESTRICTIVE SELECTIVE WINDOWS	The color reduction algorithm option to use.

Constant type	Values	What it means
ColorSpaceType	ADOBERGB COLORMATCHRGB PROPHOTORGB SRGB	The type of color space to use.
CopyrightedType	COPYRIGHTEDWORK PUBLICDOMAIN UNMARKED	The copyright status of the document.
CreateFields	DUPLICATION INTERPOLATION	The method to use for creating fields.
CropToType	ARTBOX BLEEDBOX BOUNDINGBOX CROPBOX MEDIABOX TRIMBOX	The style to use when cropping a page.
DCSType	COLORCOMPOSITE GRAYSCALECOMPOSITE NOCOMPOSITE	The DCS format to use: COLORCOMPOSITE: Creates a color composite file in addition to DCS files; GRAYSCALECOMPOSITE: Creates a grayscale composite file in addition to DCS files; NOCOMPOSITE: Does not create a composite file.
DepthMapSource	IMAGEHIGHLIGHT LAYERMASK NONE TRANSPARENCYCHANNEL	What to use for the depth map.
DescValueType	ALIASTYPE BOOLEANTYPE CLASSTYPE DOUBLETYPE ENUMERATEDTYPE INTEGERTYPE LISTTYPE OBJECTTYPE RAWTYPE REFERENCETYPE STRINGTYPE UNITDOUBLE	The value type of an object.
DialogModes	ALL ERROR NO	Controls the type (mode) of dialogs Photoshop displays when running scripts.
Direction	HORIZONTAL VERTICAL	The orientation of the object.
DisplacementMapType	STRETCHTOFIT TILE	Describes how the displacement map fits the image if the image is not the same size as the map.
Dither	DIFFUSION NOISE NONE PATTERN	The default type of dithering to use.

Constant type	Values	What it means
DocumentFill	BACKGROUNDCOLOR TRANSPARENT WHITE	The fill of the document.
DocumentMode	BITMAP CMYK DUOTONE GRAYSCALE INDEXEDCOLOR LAB MULTICHANNEL RGB	The color mode of the open document.
EditLogItemsType	CONCISE DETAILED SESSIONONLY	The history log edit options: CONCISE: Save a concise history log. DETAILED: Save a detailed history log. SESSIONONLY: Save history log only for the session.
ElementPlacement	INSIDE PLACEATBEGINNING PLACEATEND PLACEBEFORE PLACEAFTER	The object's position in the Layers palette. **Note:** Not all values are valid for all object types. Please refer to the object property definition in JavaScript Object Reference to make sure you are using a valid value.
EliminateFields	EVENFIELDS ODDFIELDS	The type of fields to eliminate.
ExportType	ILLUSTRATORPATHS SAVEFORWEB	The export options to use.
Extension	LOWERCASE NONE UPPERCASE	The formatting of the extension in the filename.
FileNamingType	DDMM DDMMYY DOCUMENTNAMELOWER DOCUMENTNAMEMIXED DOCUMENTNAMEUPPER EXTENSIONLOWER EXTENSIONUPPER MMDD MMDDYY SERIALLETTERLOWER SERIALLETTERUPPER SERIALNUMBER1 SERIALNUMBER2 SERIALNUMBER3 SERIALNUMBER4 YYDDMM YYMMDD YYYYMMDD	File naming options for the batch command.

Constant type	Values	What it means
FontPreviewType	LARGE MEDIUM NONE SMALL	The type size to use for font previews in the type tool font menus.
ForcedColors	BLACKWHITE NONE PRIMARIES WEB	The type of colors to be forced (included) into the color table: BLACKWHITE: Pure black and pure white; NONE; PRIMARIES: Red, green, blue, cyan, magenta, yellow, black, and white; WEB: the 216 web-safe colors.
FormatOptions	OPTIMIZEDBASELINE PROGRESSIVE STANDARDBASELINE	The option with which to save a JPEG file: OPTIMIZEDBASELINE: Optimized color and a slightly reduced file size; PROGRESSIVE: Displays a series of increasingly detailed scans as the image downloads; STANDARDBASELINE: Format recognized by most web browsers.
GalleryConstrainType	CONSTRAINBOTH CONSTRAINHEIGHT CONSTRAINWIDTH	The type of proportions to constrain for images.
GalleryFontType	ARIAL COURIERNEW HELVETICA TIMESNEWROMAN	The fonts to use for the Web photo gallery captions and other text.
GallerySecurityTextColorType	BLACK CUSTOM WHITE	The color to use for text displayed over gallery images as an antitheft deterrent.
GallerySecurityTextPositionType	CENTERED LOWERLEFT LOWERRIGHT UPPERLEFT UPPERRIGHT	The position of the text displayed over gallery images as an antitheft deterrent.
GallerySecurityTextRotateType	CLOCKWISE45 CLOCKWISE90 COUNTERCLOCKWISE45 COUNTERCLOCKWISE90 ZERO	The orientation of the text displayed over gallery images as an antitheft deterrent.
GallerySecurityType	CAPTION COPYRIGHT CREDIT CUSTOMTEXT FILENAME NONE TITLE	The content to use for text displayed over gallery images as an antitheft deterrent. **Note:** All types draw from the image's file information except CUSTOMTEXT.
GalleryThumbSizeType	CUSTOM LARGE MEDIUM SMALL	The size of thumbnail images in the web photo gallery.

Constant type	Values	What it means
Geometry	HEPTAGON HEXAGON OCTAGON PENTAGON SQUARE TRIANGLE	Geometric options for shapes, such as the iris shape in the Lens Blur Filter.
GridLineStyle	DASHED DOTTED SOLID	The line style for the nonprinting grid displayed over images.
GridSize	LARGE MEDIUM NONE SMALL	The value of grid line spacing.
GuideLineStyle	DASHED SOLID	The line style for nonprinting guides displayed over images.
IllustratorPathType	ALLPATHS DOCUMENTBOUNDS NAMEDPATH	The paths to export.
Intent	ABSOLUTECOLORIMETRIC PERCEPTUAL RELATIVECOLORIMETRIC SATURATION	The rendering intent to use when converting from one color space to another.
JavaScriptExecutionMode	BEFORERUNNING NEVER ONRUNTIMEERROR	The debugger mode to use.
Justification	CENTER CENTERJUSTIFIED FULLYJUSTIFIED LEFT LEFTJUSTIFIED RIGHT RIGHTJUSTIFIED	The placement of paragraph text within the bounding box.
Language	BRAZILLIANPORTUGUESE CANADIANFRENCH DANISH DUTCH ENGLISHUK ENGLISHUSA FINNISH FRENCH GERMAN ITALIAN NORWEGIAN NYNORSKNORWEGIAN OLDGERMAN PORTUGUESE SPANISH SWEDISH SWISSGERMAN	The language to use.
LayerCompression	RLE ZIP	Compression methods for data for pixels in layers.

Constant type	Values	What it means
LayerKind	BRIGHTNESSCONTRAST CHANNELMIXER COLORBALANCE CURVES GRADIENTFILL GRADIENTMAP HUESATURATION INVERSION LEVELS NORMAL PATTERNFILL POSTERIZE SELECTIVECOLOR SMARTOBJECT SOLIDFILL TEXT THRESHOLD	The kind of `artLayer` object. **Note:** You can create a text layer only from an empty art layer.
LensType	MOVIEPRIME PRIME105 PRIME35 ZOOMLENS	The type of lens to use.
MagnificationType	ACTUALSIZE FITPAGE	The type of magnification to use when viewing an image.
MatteType	BACKGROUND BLACK FOREGROUND NETSCAPE NONE SEMIGRAY WHITE	The color to use for matting.
NewDocumentMode	BITMAP CMYK GRAYSCALE LAB RGB	The color profile to use for the document.
NoiseDistribution	GAUSSIAN UNIFORM	Distribution method to use when applying an Add Noise filter.
OffsetUndefinedAreas	REPEATEDGEPIXELS SETTOBACKGROUND WRAPAROUND	Method to use to fill the empty space left by offsetting a an image or selection.
OpenDocumentMode	CMYK GRAYSCALE LAB RGB	The color profile to use.

Constant type	Values	What it means
OpenDocumentType	ACROBATTOUCHUPIMAGE ALIASPIX BMP CAMERARAW COMPUSERVEGIF ELECTRICIMAGE EPS EPSPICTPREVIEW EPSTIFFPREVIEW FILMSTRIP JPEG PCX PDF PHOTOCD PHOTOSHOP PHOTOSHOPDCS_1 PHOTOSHOPDCS_2 PHOTOSHOPEPS PHOTOSHOPPDF PICTFILEFORMAT PICTRESOURCEFORMAT PIXAR PNG PORTABLEBITMAP RAW SCITEXCT SGIRGB SOFTIMAGE TARGA TIFF WAVEFRONTRLA WIRELESSBITMAP	The format in which to open the document.
OperatingSystem	OS2 WINDOWS	The operating system.
Orientation	LANDSCAPE PORTRAIT	The page orientation.
OtherPaintingCursors	PRECISEOTHER STANDARDOTHER	The pointer for the following tools: Eraser, Pencil, Paintbrush, Healing Brush, Rubber Stamp, Pattern Stamp, Smudge, Blur, Sharpen, Dodge, Burn, Sponge.
PaintingCursors	BRUSHSIZE PRECISE STANDARD	The pointer for the following tools: Marquee, Lasso, Polygonal Lasso, Magic Wand, Crop, Slice, Patch Eyedropper, Pen, Gradient, Line, Paint Bucket, Magnetic Lasso, Magnetic Pen, Freeform Pen, Measure, Color Sampler.

Constant type	Values	What it means
Palette	EXACT LOCALADAPTIVE LOCALPERCEPTUAL LOCALSELECTIVE MACOSPALETTE MASTERADAPTIVE MASTERPERCEPTUAL MASTERSELECTIVE PREVIOUSPALETTE UNIFORM WEBPALETTE WINDOWSPALETTE	The palette type to use.
PathKind	CLIPPINGPATH NORMALPATH TEXTMASK VECTORMASK WORKPATH	The type of path.
PDFCompatibility	PDF13 PDF14 PDF15 PDF16	The PDF version to make the document compatible with.
PDFEncoding	JPEG JPEG2000HIGH JPEG2000LOSSLESS JPEG2000LOW JPEG2000MED JPEG2000MEDHIGH JPEG2000MEDLOW JPEGHIGH JPEGLOW JPEGMED JPEGMEDHIGH JPEGMEDLOW NONE PDFZIP PDFZIP4BIT	The type of compression to use when saving a document in PDF format.
PDFResample	NONE PDFAVERAGE PDFBICUBIC PDFSUBSAMPLE	The down sample method to use.
PDFStandard	NONE PDFX1A2001 PDFX1A2003 PDFX32002 PDFX32003	The PDF standard to make the document compatible with.
PhotoCDColorSpace	LAB16 LAB8 RGB16 RGB8	The color space to use when creating a Photo CD.
PhotoCDSize	EXTRALARGE LARGE MAXIMUM MEDIUM MINIMUM SMALL	The pixel dimensions of the image.

Constant type	Values	What it means
PICTBitsPerPixels	EIGHT FOUR SIXTEEN THIRTYTWO TWO	The number of bits per pixel to use when compression a PICT file. **Note:** Use 16 or 32 for RGB images; use 2, 4, or 8 for bitmap and grayscale images.
PICTCompression	JPEGHIGHPICT JPEGLOWPICT JPEGMAXIMUMPICT JPEGMEDIUMPICT NONE	The type of compression to use when saving an image as a PICT file.
PicturePackageTextType	CAPTION COPYRIGHT CREDIT FILENAME NONE ORIGIN USER	The function or meaning of text in a Picture Package.
PointKind	CORNERPOINT SMOOTHPOINT	The role a `pathPoint` plays in a `pathItem`.
PointType	POSTSCRIPT TRADITIONAL	The kind of measurement to use for type points: `POSTSCRIPT` = 72 points/inch; `TRADITIONAL` = 72.27 points/inch.
PolarConversionType	POLARTORECTANGULAR RECTANGULARTOPOLAR	The method of polar distortion to use.
Preview	EIGHTBITTIFF MACOSEIGHTBIT MACOSJPEG MACOSMONOCHROME MONOCHROMETIFF NONE	The type of image to use as a low-resolution preview in the destination application.
PrintEncoding	ASCII BINARY JPEG	The type of encoding to use.
PurgeTarget	ALLCACHES CLIPBOARDCACHE HISTORYCACHES UNDOCACHES	Cache to be targeted in a purge operation.
QueryStateType	ALWAYS ASK NEVER	Permission state for queries.
RadialBlurMethod	SPIN ZOOM	The blur method to use.
RadialBlurQuality	BEST DRAFT GOOD	The smoothness or graininess of the blurred image.

Constant type	Values	What it means
RasterizeType	ENTIRELAYER FILLCONTENT LAYERCLIPPINGPATH LINKEDLAYERS SHAPE TEXTCONTENTS	The layer element to rasterize.
ReferenceFormType	CLASSTYPE ENUMERATED IDENTIFIER INDEX NAME OFFSET PROPERTY	The type of an ActionReference object.
ResampleMethod	BICUBIC BICUBICSHARPER BICUBICSMOOTHER BILINEAR NEARESTNEIGHBOR NONE	The method to use for image interpolation.
ResetTarget	ALLTOOLS ALLWARNINGS EVERYTHING	The type of object or objects to reset to default settings.
RippleSize	LARGE MEDIUM SMALL	The size of undulations to use.
SaveBehavior	ALWAYSSAVE ASKWHENSAVING NEVERSAVE	The application's behavior when a `save()` method is called.
SaveDocumentType	ALIASPIX BMP COMPUSERVEGIF ELECTRICIMAGE JPEG PCX PHOTOSHOP PHOTOSHOPDCS_1 PHOTOSHOPDCS_2 PHOTOSHOPEPS PHOTOSHOPPDF PICTFileFORMAT PICTRESOURCEFORMAT PIXAR PNG PORTABLEBITMAP RAW SCITEXCT SGIRGB SOFTIMAGE TARGA TIFF WAVEFRONTRLA WIRELESSBITMAP	The format in which to save a document. **Note:** The `format` property of the `ExportOptionsSaveForWeb` class uses only the following values: `COMPUSERVEGIF`, `JPEG`, `PNG-8`, `PNG-24`, and `BMP`. See ExportOptionsSaveForWeb.

Constant type	Values	What it means
SaveEncoding	ASCII BINARY JPEGHIGH JPEGLOW JPEGMAXIMUM JPEGMEDIUM	The type of encoding to use when saving a file.
SaveLogItemsType	LOGFILE LOGFILEANDMETADATA METADATA	The location of history log data.
SaveOptions	DONOTSAVECHANGES PROMPTTOSAVECHANGES SAVECHANGES	The 'save' method to use when closing a document.
SelectionType	DIMINISH EXTEND INTERSECT REPLACE	The selection behavior when a selection already exists: DIMINISH: Remove the selection from the already selected area; EXTEND: Add the selection to an already selected area; INTERSECT: Make the selection only the area where the new selection intersects the already selected area; REPLACE: Replace the selected area.
ShapeOperation	SHAPEADD SHAPEINTERSECT SHAPESUBTRACT SHAPEXOR	A subPathItem object's behavior when it intersects another subPathItem object.
SmartBlurMode	EDGEONLY NORMAL OVERLAYEDGE	The method to use for smart blurring: EDGEONLY, OVERLAYEDGES: Apply blur only to edges of color transitions; NORMAL: Apply blur to entire image.
SmartBlurQuality	HIGH LOW MEDIUM	The blur quality to use.
SourceSpaceType	DOCUMENT PROOF	
SpherizeMode	HORIZONTAL NORMAL VERTICAL	The curve (or stretch shape) to use for the distortion.
StrikeThruType	STRIKEBOX STRIKEHEIGHT STRIKEOFF	The style of strikethrough to use.
StrokeLocation	CENTER INSIDE OUTSIDE	The placement of path or selection boundary strokes.
TargaBitsPerPixels	SIXTEEN THIRTYTWO TWENTYFOUR	The resolution to use when saving an image in Targa format.
TextCase	ALLCAPS NORMAL SMALLCAPS	The case usage for type.

Constant type	Values	What it means
TextComposer	ADOBEEVERYLINE ADOBESINGLELINE	The composition method to use to optimize the specified hyphenation and justification options.
TextType	PARAGRAPHTEXT POINTTEXT	The type of text: PARAGRAPHTEXT: Text that wraps within a bounding box; POINTTEXT: Text that does not wrap.
TextureType	BLOCKS CANVAS FILE FROSTED TINYLENS	The type of texture or glass surface image to load for a texturizer or glass filter.
TIFFEncoding	JPEG NONE TIFFLZW TIFFZIP	The encoding to use for TIFF files.
ToolType	ARTHISTORYBRUSH BACKGROUNDERASER BLUR BRUSH BURN CLONESTAMP COLORREPLACEMENTTOOL DODGE ERASER HEALINGBRUSH HISTORYBRUSH PATTERNSTAMP PENCIL SHARPEN SMUDGE SPONGE	The tool selection.
TransitionType	BLINDSHORIZONTAL BLINDSVERTICAL BOXIN BOXOUT DISSOLVE GLITTERDOWN GLITTERRIGHT GLITTERRIGHTDOWN NONE RANDOM SPLITHORIZONTALIN SPLITHORIZONTALOUT SPLITVERTICALIN SPLITVERTICALOUT WIPEDOWN WIPELEFT WIPERIGHT WIPEUP	The method to use to transition from one image to the next in a PDF presentation.
TrimType	BOTTOMRIGHT TOPLEFT TRANSPARENT	Type of pixels to trim around an image: BOTTOMRIGHT = bottom right pixel color; TOPLEFT = top left pixel color.

Constant type	Values	What it means
TypeUnits	MM PIXELS POINTS	The unit to use for measuring text characters.
UndefinedAreas	REPEATEDGEPIXELS WRAPAROUND	The method to use to treat undistorted areas or areas left blank in an image to which the a filter in the Distort category has been applied.
UnderlineType	UNDERLINELEFT UNDERLINEOFF UNDERLINERIGHT	The placement of text underlining. **Note:** `UnderlineType.UNDELINELEFT` and `UnderlineType.UNDELINERIGHT` are valid only when `direction = Direction.VERTICAL`.
Units	CM INCHES MM PERCENT PICAS PIXELS POINTS	The measurement unit for type and ruler increments.
Urgency	FOUR HIGH LOW NONE NORMAL SEVEN SIX THREE TWO	The editorial urgency of the artwork.
WarpStyle	ARC ARCH ARCLOWER ARCUPPER BULGE FISH FISHEYE FLAG INFLATE NONE RISE SHELLLOWER SHELLUPPER SQUEEZE TWIST WAVE	The warp style to use.
WaveType	SINE SQUARE TRIANGULAR	The type of wave to use.

Constant type	Values	What it means
WhiteBalanceType	ASSHOT AUTO CLOUDY CUSTOM DAYLIGHT FLASH FLUORESCENT SHADE TUNGSTEN	The lighting conditions to use (affects color balance).
ZigZagType	AROUNDCENTER OUTFROMCENTER PONDRIPPLES	The method of zigzagging to use.

9 ExtendScript Tools and Features

ExtendScript is Adobe's extended implementation of JavaScript, and is used by all Adobe Creative Suite 2 applications that provide a scripting interface. In addition to implementing the JavaScript language according to the W3C specification, ExtendScript provides certain additional features and utilities.

- For help in developing, debugging, and testing scripts, ExtendScript provides:
  - The ExtendScript Toolkit, an interactive development and testing environment for ExtendScript.
  - A global debugging object, the Dollar ($) Object.
  - A reporting utility for ExtendScript elements, the ExtendScript Reflection Interface.
- In addition, ExtendScript provides these tools and features:
  - A localization utility for providing user-interface string values in different languages. See Localizing ExtendScript Strings.
  - Global functions for displaying short messages in dialog boxes. See User Notification Helper Functions.
  - An object type for specifying measurement values together with their units. See Specifying Measurement Values.
  - Tools for combining scripts, such as a `#include` directive, and `import` and `export` statements. See Modular Programming Support.
  - Support for extending or overriding math and logical operator behavior on a class-by-class basis. See Operator Overloading.
- ExtendScript provides a common scripting environment for all Adobe Creative Suite 2 applications, and allows interapplication communication through scripts.
  - To identify specific Adobe Creative Suite 2 applications, scripts must use Application and Namespace Specifiers.
  - Applications can run scripts automatically on startup. See Script Locations and Checking Application Installation.
  - For details about interapplication communication, see the *Bridge JavaScript Reference*, available with Adobe Creative Suite 2.

The ExtendScript Toolkit

The ExtendScript Toolkit provides an interactive development and testing environment for ExtendScript in all Adobe Creative Suite 2 applications. It includes a full-featured, syntax-highlighting editor with Unicode capabilities and multiple undo/redo support. The Toolkit allows you to:

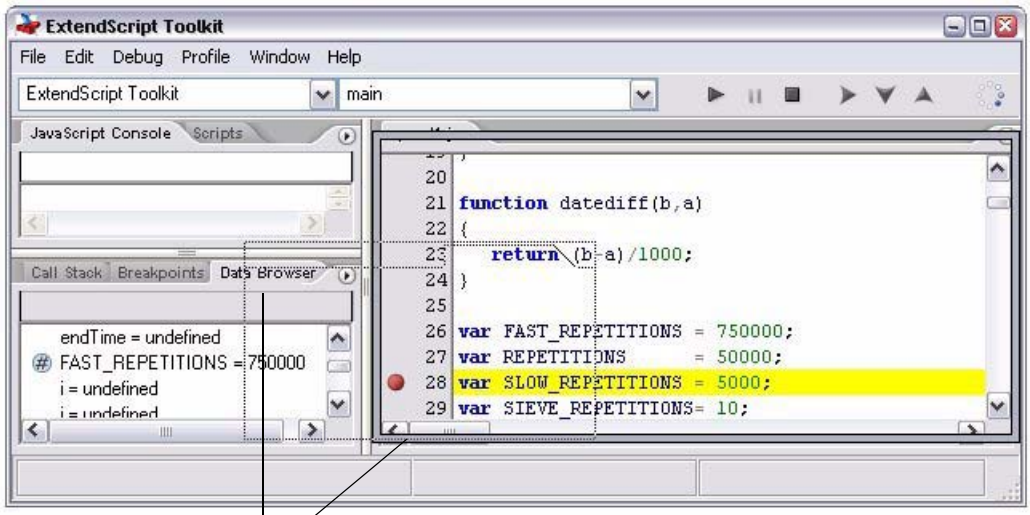
- Single-step through JavaScripts inside a CS2 application.
- Inspect all data for a running script.
- Set and execute breakpoints.

The Toolkit is the default editor for ExtendScript files, which use the extension `.jsx`. You can use the Toolkit to edit or debug scripts in JS or JSX files.

When you double-click a JSX file in the platform's windowing environment, the script runs in the Toolkit, unless it specifies a particular target application using the `#target` directive. For more information, see Selecting a debugging target and Preprocessor directives.

Configuring the Toolkit window

The ExtendScript Toolkit initially appears with a default arrangement of panes, containing a default configuration of tabs. You can adjust the relative sizes of the panes by dragging the separators up or down, or right or left. You can regroup the tabs. To move a tab, drag the label into another pane.



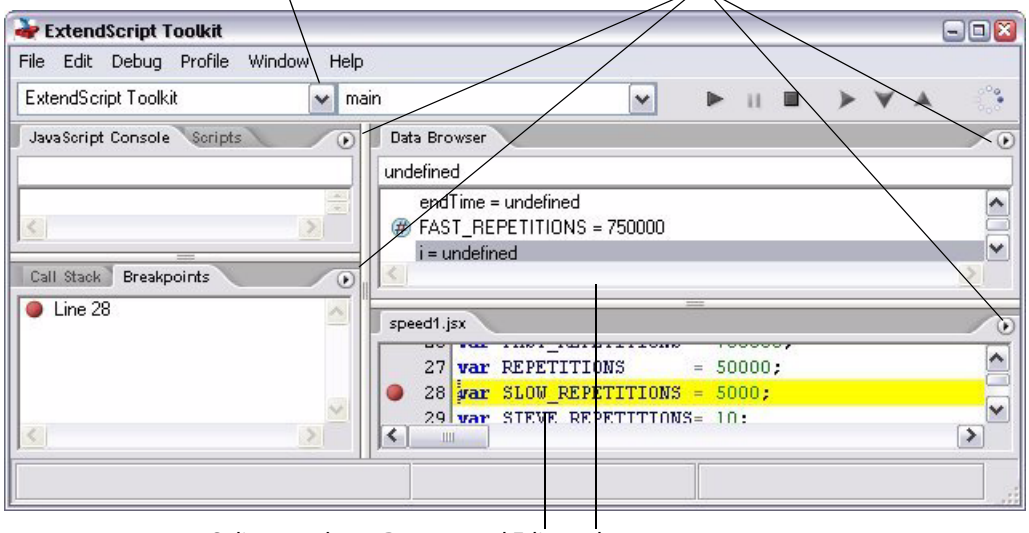
Drag a tab to a new pane

Destination pane is highlighted, and the new tab is added to the tab stack

If you drag a tab so that the entire destination pane is highlighted, it becomes another stacked tab in that pane. If you drag a tab to the top or bottom of a pane (so that only the top or bottom bar of the destination pane is highlighted), that pane splits to show the tabs in a tiled format.

Select target application

Invoke tab flyout menus



Split pane shows Browser and Editor tabs

Each tab has a flyout menu, accessed through the arrow icon in the upper right corner. The same menu is available as a context menu, which you invoke with a right click in the tab. This menu always includes a **Hide Pane** command to hide that pane. Use the **Window** menu to show a hidden pane, or to bring it to the front.

The Editor, which has a tab for each script, has an additional context menu for debugging, which appears when you right-click in the line numbers area.

The Toolkit saves the current layout when you exit, and restores it at the next startup. It also saves and restores the open documents, the current positions within the documents, and any breakpoints that have been set.

- If you do not want to restore all settings on startup, hold SHIFT while the Toolkit loads to restore default settings. This reconnects to the last application and engine that was selected.
- If you want to restore the layout settings on startup, but not load the previously open documents, choose **Start with a clean workspace** in the Preferences dialog.

Selecting a debugging target

The Toolkit can debug multiple applications at one time. If you have more than one Adobe Creative Suite 2 application installed, use the drop-down list at the upper left under the menu bar to select the target application. All installed applications that use ExtendScript are shown in this list. If you select an application that is not running, the Toolkit prompts for permission to run it.

All available engines in the selected target application are shown in a drop-down list to the right of the application list, with an icon that shows the current debugging status of that engine. A target application can have more than one ExtendScript engine, and more than one engine can be *active*, although only one is *current*. An active engine is one that is currently executing code, is halted at a breakpoint, or, having executed all scripts, is waiting to receive events. An icon by each engine name indicates whether it is *running*, *halted*, or *waiting* for input:

	**running**
	**halted**
	**waiting**

The current engine is the one whose data and state is displayed in the Toolkit's panes. If an application has only one engine, its engine becomes current when you select the application as the target. If there is more than one engine available in the target application, you can select an engine in the list to make it current.

When you open the Toolkit, it attempts to reconnect to the same target and engine that was set last time it closed. If that target application is not running, the Toolkit prompts for permission to launch it. If permission is refused, the Toolkit itself becomes the target application.

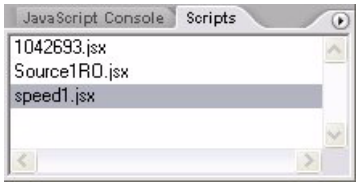
If the target application that you select is not running, the Toolkit prompts for permission and launches the application. Similarly, if you run a script that specifies a target application that is not running (using the `#target` directive), the Toolkit prompts for permission to launch it. If the application is running but not selected as the current target, the Toolkit prompts you to switch to it.

If you select an application that cannot be debugged in the Toolkit (such as Adobe Help), an error dialog reports that the Toolkit cannot connect to the selected application.

The ExtendScript Toolkit is the default editor for JSX files. If you double-click a JSX file in a file browser, the Toolkit looks for a `#target` directive in the file and launches that application to run the script; however, it first checks for syntax errors in the script. If any are found, the Toolkit displays the error in a message box and quits silently, rather than launching the target application. For example:

Selecting scripts

The Scripts tab offers a list of debuggable scripts for the target application, which can be JS or JSX files or (for some applications) HTML files that contain embedded scripts.



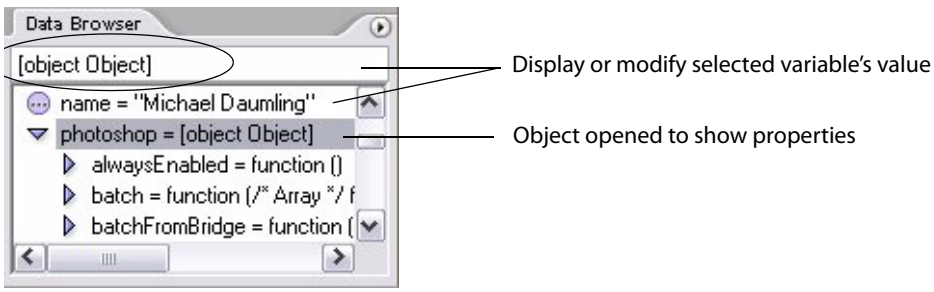
Select a script in this tab to load it and display its contents in the editor pane, where you can modify it, save it, or run it within the target application.

Tracking data

The Data Browser tab is your window into the JavaScript engine. It displays all live data defined in the current context, as a list of variables with their current values. If execution has stopped at a breakpoint, it shows variables that have been defined using `var` in the current function, and the function arguments. To show variables defined in the global or calling scope, use the Call Stack to change the context (see The call stack).

You can use the Data Browser to examine and set variable values.

- Click a variable name to show its current value in the edit field at the top of the tab.
- To change the value, enter a new value and press ENTER. If a variable is read-only, the edit field is disabled.



The flyout menu for this tab lets you control the amount of data displayed:

- **Show Global Functions** toggles the display of all global function definitions.
- **Show Object Methods** toggles the display of all functions that are attached to objects. Most often, the interesting data in an object are its callable methods.
- **Show JavaScript Language Elements** toggles the display of all data that is part of the JavaScript language standard, such as the Array constructor or the Math object. An interesting property is the `__proto__` property, which reveals the JavaScript object prototype chain.

Each variable has a small icon that indicates the data type. An invalid object is a reference to an object that has been deleted. If a variable is undefined, it does not have an icon.

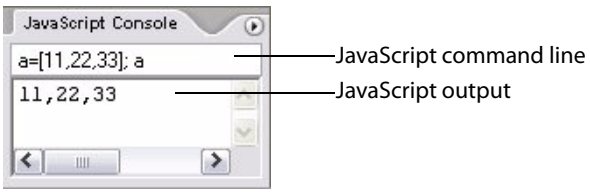
	**null**
	**Boolean**
	**Number**
	**String**
	**Object**
	**Invalid object**

You can inspect the contents of an object by clicking its icon. The list expands to show the object's properties (and methods, if **Show Object Methods** is enabled), and the triangle points down to indicate that the object is open.

Note: In Photoshop CS2 the Data Browser pane is populated only during the debugging of a JavaScript program within Photoshop.

The JavaScript console

The JavaScript console is a command shell and output window for the currently selected JavaScript engine. It connects you to the global namespace of that engine.



The command line entry field accepts any JavaScript code, and you can use it to evaluate expressions or call functions. Enter any JavaScript statement on the command line and execute it by pressing ENTER. The statement executes within the stack scope of the line highlighted in the Call Stack tab, and the result appears in the output field.

- The command line input field keeps a command history of 32 lines. Use the Up and Down Arrow keys to scroll through the previous entries.

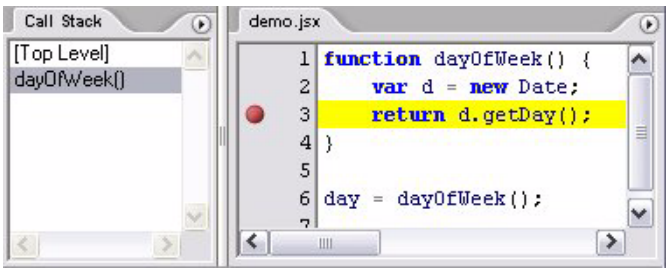
- Commands entered in this field execute with a timeout of one second. If a command takes longer than one second to execute, the Toolkit generates a timeout error and terminates the attempt.

The output field is standard output for JavaScript execution. If any script generates a syntax error, the error is displayed here along with the file name and the line number. The Toolkit displays errors here during its own startup phase. The tab's flyout menu allows you to clear the contents of the output field and change the size of the font used for output.

The call stack

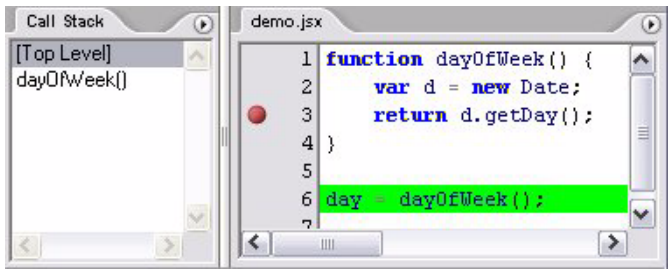
The Call Stack tab is active while debugging a program. When an executing program stops because of a breakpoint or runtime error, the tab displays the sequence of function calls that led to the current execution point. The Call Stack tab shows the names of the active functions, along with the actual arguments passed in to that function.

For example, this stack pane shows a break occurring at a breakpoint in a function `dayOfWeek`:



The function containing the breakpoint is highlighted in both the Call Stack and the Editor tabs.

You can click any function in the call hierarchy to inspect it. In the Editor, the line containing the function call that led to that point of execution is marked with a green background. In the example, when you select the line `[Top Level]` in the call stack, the Editor highlights the line where the `dayOfWeek` function was called.



Switching between the functions in the call hierarchy allows you to trace how the current function was called. The Console and Data Browser tabs coordinate with the Call Stack pane. When you select a function in the Call Stack:

- The Console pane switches its scope to the execution context of that function , so you can inspect and modify its local variables. These would otherwise be inaccessible to the running JavaScript program from within a called function.
- The Data Browser pane displays all data defined in the selected context.

The Script Editor

You can open any number of Script Editor tabs; each displays one Unicode source code document. The editor supports JavaScript syntax highlighting, JavaScript syntax checking, multiple undo and redo operations, and advanced search and replace functionality.

You can use the mouse or special keyboard shortcuts to move the insertion point or to select text in the editor.

Mouse navigation and selection

Click the left mouse button in the editor to move the position caret.

To select text with the mouse, click in unselected text, then drag over the text to be selected. If you drag above or below the currently displayed text, the text scrolls, continuing to select while scrolling. You can also double-click to select a word, or triple-click to select a line.

To initiate a drag-and-drop of selected text, click in the block of selected text, then drag to the destination. You can drag text from one editor pane to another. You can also drag text out of the Toolkit into another application that accepts dragged text, and drag text from another application into a Toolkit editor.

You can drop files from the Explorer or the Finder onto the Toolkit to open them in an editor.

Keyboard navigation and selection

Besides the usual keyboard input, the editor accepts these special movement keys. You can also select text by using a movement key while pressing SHIFT.

Enter	Insert a Line Feed character
Backspace	Delete character to the left
Delete	Delete character to the right
Left arrow	Move insertion point left one character
Right arrow	Move insertion point right one character
Up arrow	Move insertion point up one line; stay in column if possible
Down arrow	Move insertion point down one line; stay in column if possible
Page up	Move insertion point one page up
Page down	Move insertion point one page down
CTRL + Up arrow	Scroll up one line without moving the insertion point
Ctrl + Down arrow	Scroll down one line without moving the insertion point
CTRL + Page up	Scroll one page up without moving the insertion point
CTRL + page down	Scroll one page down without moving the insertion point
CTRL + Left arrow	Move insertion point one word to the left
CTRL + right arrow	Move insertion point one word to the right

Home	Move insertion point to start of line
End	Move insertion point to end of line
CTRL + Home	Move insertion point to start of text
CTRL + End	Move insertion point to end of text

The editor supports extended keyboard input via IME (Windows) or TMS (Mac OS). This is especially important for Far Eastern characters.

Syntax checking

Before running the new script or saving the text as a script file, you can check whether the text contains JavaScript syntax errors. Choose **Check Syntax** from the **Edit** menu or from the Editor's right-click context menu.

- If the script is syntactically correct, the status line shows "No syntax errors".
- If the Toolkit finds a syntax error, such as a missing quote, it highlights the affected text, plays a sound, and shows the error message in the status line so you can fix the error.

Debugging in the Toolkit

You can debug the code in the currently active Editor tab. Select one of the debugging commands to either run or to single-step through the program.

When you run code from the Editor, it runs in the current target application's selected JavaScript engine. The Toolkit itself runs an independent JavaScript engine, so you can quickly edit and run a script without connecting to a target application.

Evaluation in help tips

If you let your mouse pointer rest over a variable or function in an Editor tab, the result of evaluating that variable or function is displayed as a help tip. When you are not debugging the program, this is helpful only if the variables and functions are already known to the JavaScript engine. During debugging, however, this is an extremely useful way to display the current value of a variable, along with its current data type.

You can turn off the display of help tips using the **Display JavaScript variables** and **Enable UI help tips** checkboxes on the Help Options page of the Preferences dialog.

Controlling code execution

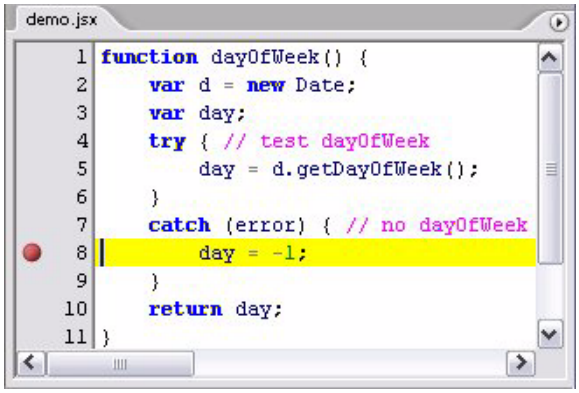
The debugging commands are available from the **Debug** menu, from the Editor's right-click context menu, through keyboard shortcuts, and from the toolbar buttons. Use these menu commands and buttons to control the execution of code when the JavaScript Debugger is active.

	Run **Continue**	**F5** (Windows) **Ctrl R** (Mac OS)	Starts or resumes execution of a script. Disabled when script is executing.
	**Break**	**Ctrl-F5** (Windows) **Cmd .** (Mac OS)	Halts the currently executing script temporarily and reactivates the JavaScript Debugger. Enabled when a script is executing.
	**Stop**	**Shift F5** (Windows) **Ctrl K** (Mac OS)	Stops execution of the script and generates a runtime error. Enabled when a script is executing.
	**Step Over**	**F10** (Windows) **Ctrl S** (Mac OS)	Halts after executing a single JavaScript line in the script. If the statement calls a JavaScript function, executes the function in its entirety before stopping (do not step into the function).
	**Step Into**	**F11** (Windows) **Ctrl T** (Mac OS)	Halts after executing a single JavaScript line statement in the script or after executing a single statement in any JavaScript function that the script calls.
	**Step Out**	**Shift F11** (Windows) **Ctrl U** (Mac OS)	When paused within the body of a JavaScript function, resumes script execution until the function returns. When paused outside the body of a function, resumes script execution until the script terminates.

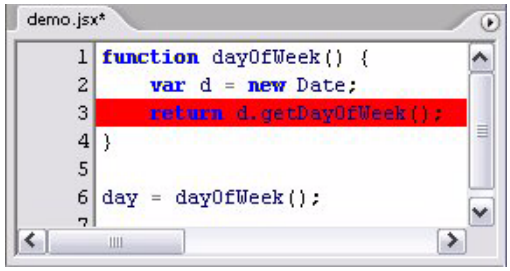
Visual indication of execution states

While the engine is running, an icon  in the upper right corner of the Toolkit window indicates that the script is active.

When the execution of a script halts because the script reached a breakpoint, or when the script reaches the next line when stepping line by line, the Editor displays the current script with the current line highlighted in yellow.



If the script encounters a runtime error, the Toolkit halts the execution of the script, displays the current script with the current line highlighted in red, displays the error message in the status line, and plays a sound.



Scripts often use a `try`/`catch` clause to execute code that may cause a runtime error, in order to catch the error programmatically rather than have the script terminate. You can choose to allow regular processing of such errors using the `catch` clause, rather than breaking into the debugger. To set this behavior, choose **Debug** > **Don't Break On Guarded Exceptions**. Some runtime errors, such as `Out Of Memory`, always cause the termination of the script, regardless of this setting.

Setting breakpoints

When debugging a script, it is often helpful to make it stop at certain lines so that you can inspect the state of the environment, whether function calls are nested properly, or whether all variables contain the expected data.

- To stop execution of a script at a given line, click to the left of the line number to set a breakpoint. A filled dot indicates the breakpoint.
- Click a second time to temporarily disable the breakpoint; the icon changes to an outline.
- Click a third time to delete the breakpoint. The icon is removed.

Some breakpoints need to be conditional. For example, if you set a breakpoint in a loop that is executed several thousand times, you would not want to have the program stop each time through the loop, but only on each 1000th iteration.

You can attach a condition to a breakpoint, in the form of a JavaScript expression. Every time execution reaches the breakpoint, it runs the JavaScript expression. If the expression evaluates to a nonzero number or `true`, execution stops.

To set a conditional breakpoint in a loop, for example, the conditional expression could be `"i >= 1000"`, which means that the program execution halts if the value of the iteration variable `i` is equal to or greater than 1000.

You can set breakpoints on lines that do not contain any code, such as comment lines. When the Toolkit runs the program, it automatically moves such a breakpoint down to the next line that actually contains code.

Breakpoint icons

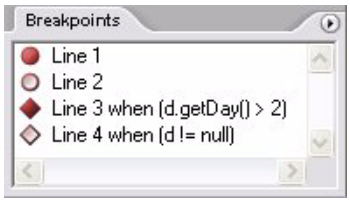
Each breakpoint is indicated by an icon to the left of the line number. The icon for a conditional breakpoint is a diamond, while the icon for an unconditional breakpoint is round. Disabled breakpoints are indicated by an outline icon, while active ones are filled.

	Unconditional breakpoint. Execution stops here.
	Unconditional breakpoint, disabled. Execution does not stop.

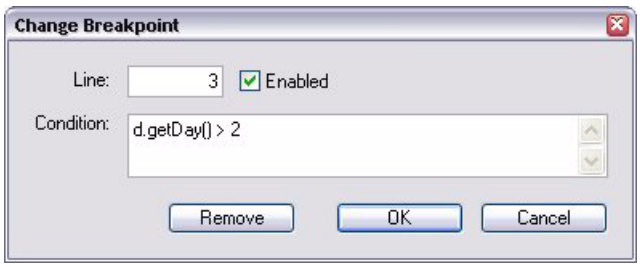
	Conditional breakpoint. Execution stops if the attached JavaScript expression evaluates to `true`.
	Conditional breakpoint, disabled. Execution does not stop.

The Breakpoints tab

The Breakpoints tab displays all breakpoints set in the current Editor tab. You can use the tab's flyout menu to add, change, or remove a breakpoint.



You can edit a breakpoint by double-clicking it, or by selecting it and choosing **Add** or **Change** from the context menu. A dialog allows you to change the line number, the breakpoint's enabled state, and the condition statement.



Whenever execution reaches this breakpoint, the debugger evaluates this condition. If it does not evaluate to `true`, the breakpoint is ignored and execution continues. This allows you to break only when certain conditions are met, such as a variable having a particular value.

Profiling

The Profiling tool helps you to optimize program execution. When you turn profiling on, the JavaScript engine collects information about a program while it is running. It counts how often the program executed a line or function, or how long it took to execute a line or function. You can choose exactly which profiling data to display.

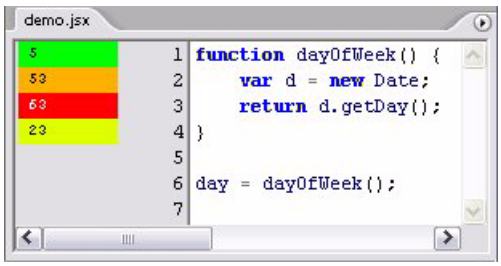
Because profiling significantly slows execution time, the **Profile** menu offers these profiling options.

Off	Profiling turned off. This is the default.
Functions	The profiler counts each function call. At the end of execution, displays the total to the left of the line number where the function header is defined.
Lines	The profiler counts each time each line is executed. At the end of execution, displays the total to the left of the line number. Consumes more execution time, but delivers more detailed information.

Add Timing Info	Instead of counting the functions or lines, records the time taken to execute each function or line. At the end of execution, displays the total number of microseconds spent in the function or line, to the left of the line number. This is the most time-consuming form of profiling.
No Profiler Data	When selected, do not display profiler data.
Show Hit Count	When selected, display hit counts.
Show Timing	When selected, display timing data.
Erase Profiler Data	Clear all profiling data.
Save Data As	Save profiling data as comma-separated values in a CSV file that can be loaded into a spreadsheet program such as Excel.

When execution halts (at termination, at a breakpoint, or due to a runtime error), the Toolkit displays this information in the Editor, line by line. The profiling data is color coded:

- Green indicates the lowest number of hits, or the fastest execution time.
- Red indicates trouble spots, such as a line that has been executed many times, or which line took the most time to execute.



This example displays timing information for the program, where the fastest line took 4 microseconds to execute, and the slowest line took 29 microseconds. The timing might not be accurate down to the microsecond; it depends on the resolution and accuracy of the hardware timers built into your computer.

Dollar ($) Object

This global ExtendScript object provides a number of debugging facilities and informational methods. The properties of the `$` object allow you to get global information such as the most recent run-time error, and set flags that control debugging and localization behavior. The methods allow you to output text to the JavaScript Console during script execution, control execution and other ExtendScript behavior programmatically, and gather statistics on object use.

Dollar ($) object properties

`build`	Number	The ExtendScript build number. Read only.
`buildDate`	Date	The date ExtendScript was built. Read only.
`error`	Error String	The most recent run-time error information, contained in a JavaScript `Error` object. Assigning error text to this property generates a run-time error; however, the preferred way to generate a run-time error is to throw an `Error` object.
`flags`	Number	Gets or sets low-level debug output flags. A logical AND of the following bit flag values: `0x0002` (2): Displays each line with its line number as it is executed. `0x0040` (64): Enables excessive garbage collection. Usually, garbage collection starts when the number of objects has increased by a certain amount since the last garbage collection. This flag causes ExtendScript to garbage collect after almost every statement. This impairs performance severely, but is useful when you suspect that an object gets released too soon. `0x0080` (128): Displays all calls with their arguments and the return value. `0x0100` (256): Enables extended error handling (see strict). `0x0200` (512): Enables the localization feature of the `toString` method. Equivalent to the localize property.
`global`	Object	Provides access to the global object, which contains the JavaScript global namespace.
`level`	Number	Enables or disables the JavaScript debugger. One of: 0: No debugging 1: Break on runtime errors 2: Full debug mode
`locale`	String	Gets or sets the current locale. The string contains five characters in the form *LL_RR*, where *LL* is an ISO 639 language specifier, and *RR* is an ISO 3166 region specifier. Initially, this is the value that the application or the platform returns for the current user. You can set it to temporarily change the locale for testing. To return to the application or platform setting, set to `undefined`, `null`, or the empty string.

localize	Boolean	Enable or disable the extended localization features of the built-in `toString` method. See Localizing ExtendScript Strings.
memCache	Number	Gets or sets the ExtendScript memory cache size in bytes.
objects	Number	The total count of all JavaScript objects defined so far. Read only.
os	String	The current operating system version. Read only.
screens	Array	An array of objects containing information about the display screens attached to your computer. Each object has the properties `left`, `top`, `right`, and `bottom`, which contain the four corners of each screen in global coordinates. A property `primary` is `true` if that object describes the primary display.
strict	Boolean	When `true`, any attempt to write to a read-only property causes a runtime error. Some objects do not permit the creation of new properties when `true`.
version	String	The version number of the ExtendScript engine as a three-part number and description; for example: "3.6.5 (debug)" Read only.

Dollar ($) object functions

about `$.about ()`	Displays the About box for the ExtendScript component, and returns the text of the About box as a string.
bp `$.bp ([`*condition*`])`	Executes a breakpoint at the current position. Returns `undefined`. If no condition is needed, it is recommended that you use the JavaScript `debugger` statement in the script, rather than this method.
condition	Optional. A string containing a JavaScript statement to be used as a condition. If the statement evaluates to `true` or nonzero when this point is reached, execution stops.
clearbp `$.clearbp ([`*line*`])`	Removes a breakpoint from the current script. Returns `undefined`.
line	Optional. The line at which to clear the breakpoint. If 0 or not supplied, clears the breakpoint at the current line number.
gc `$.gc ()`	Initiates garbage collection. Returns `undefined`.
getenv `$.getenv (`*envname*`)`	Returns the value of the specified environment variable, or `null` if no such variable is defined.
envname	The name of the environment variable.
list `$.list ([`*classname*`])`	Collects object information into a table and returns this table as a string. See Object statistics below.
classname	Optional. The type of object about which to collect information. If not supplied, collects information about all objects currently defined.

setbp `$.setbp ([line, condition])`	Sets a breakpoint in the current script. Returns `undefined`. If no arguments are needed, it is recommended that you use the JavaScript `debugger` statement in the script, rather than this method.
line	Optional. The line at which to stop execution. If 0 or not supplied, sets the breakpoint at the current line number.
condition	Optional. A string containing a JavaScript statement to be used for a conditional breakpoint. If the statement evaluates to `true` or nonzero when the line is reached, execution stops.
sleep `$.sleep (milliseconds)`	Suspends the calling thread for the given number of milliseconds. Returns `undefined`. During a sleep period, checks at 100 millisecond intervals to see whether the sleep should be terminated. This can happen if there is a break request, or if the script timeout has expired.
milliseconds	The number of milliseconds to wait.

summary
`$.summary ([classname])`
	Collects a summary of object counts into a table and returns this table as a string. The table shows the number of objects in each specified class. For example:
	`3 Array`
	`5 String`

classname	Optional. The type of object to count. If not supplied, counts all objects currently defined.
write `$.write (text[, text...]...)`	Writes the specified text to the JavaScript Console. Returns `undefined`.
text	One or more strings to write, which are concatenated to form a single string.
writeln `$.writeln (text[, text...]...)`	Writes the specified text to the JavaScript Console and appends a linefeed sequence. Returns `undefined`.
text	One or more strings to write, which are concatenated to form a single string.

Object statistics

The output from `$.list()` is formatted as in the following example.

Address	L	Refs	Prop	Class	Name
0092196c	4	0	Function	[toplevel]	
00976c8c	2	1	Object	Object	
00991bc4 L	1	1	LOTest	LOTest	
0099142c L	2	2	Function	LOTest	
00991294	1	0	Object	Object	workspace

The columns show the following object information.

Address	The physical address of the object in memory.
L	This column contains the letter "L" if the object is a LiveObject (which is an internal data type).
Refs	The reference count of the object.
Prop	A second reference count for the number of properties that reference the object. The garbage collector uses this count to break circular references. If the reference count is not equal to the number of JavaScript properties that reference it, the object is considered to be used elsewhere and is not garbage collected.
Class	The class name of the object.
Name	The name of the object. This name does not reflect the name of the property the object has been stored into. The name is mostly relevant to Function objects, where it is the name of the function or method. Names in brackets are internal names of scripts. If the object has an ID, the last column displays that ID.

ExtendScript Reflection Interface

ExtendScript provides a reflection interface that allows you to find out everything about an object, including its name, a description, the expected data type for properties, the arguments and return value for methods, and any default values or limitations to the input values.

Reflection Object

Every object has a `reflect` property that returns a `reflection` object that reports the contents of the object. You can, for example, show the values of all the properties of an object with code like this:

```
var f= new File ("myfile");
var props = f.reflect.properties;
for (var i = 0; i < props.length; i++) {
    $.writeln('this property ' + props[i].name + ' is ' + f[props[i].name]);
}
```

Reflection object properties

All properties are read only.

`description`	String	Short text describing the reflected object, or `undefined` if no description is available.
`help`	String	Longer text describing the reflected object more completely, or `undefined` if no description is available.
`methods`	Array of ReflectionInfo	An Array of ReflectionInfo Objects containing all methods of the reflected object, defined in the class or in the specific instance.
`name`	String	The class name of the reflected object.
`properties`	Array of ReflectionInfo	An Array of ReflectionInfo Objects containing all properties of the reflected object, defined in the class or in the specific instance. For objects with dynamic properties (defined at runtime) the list contains only those dynamic properties that have already been accessed by the script. For example, in an object wrapping an HTML tag, the names of the HTML attributes are determined at run time.

Reflection object functions

`find` *`reflectionObj`*`.find (`*`name`*`)`	Returns the ReflectionInfo Object for the named property of the reflected object, or `null` if no such property exists. Use this method to get information about dynamic properties that have not yet been accessed, but that are known to exist.
`name`	The property for which to retrieve information.

➤ Examples

This code determines the class name of an object:

```
obj = new String ("hi");
obj.reflect.name; // => String
```

This code gets a list of all methods:

```
obj = new String ("hi");
obj.reflect.methods; //=> indexOf,slice,...
obj.reflect.find ("indexOf"); // => the method info
```

This code gets a list of properties:

```
Math.reflect.properties; //=> PI,LOG10,...
```

This code gets the data type of a property:

```
Math.reflect.find ("PI").type; // => number
```

ReflectionInfo Object

This object contains information about a property, a method, or a method argument.

- You can access `ReflectionInfo` objects in a Reflection Object's `properties` and `methods` arrays, by name or index:

```
obj = new String ("hi");
obj.reflect.methods[0];
obj.reflect.methods["indexOf"];
```

- You can access the `ReflectionInfo` objects for the arguments of a method in the `arguments` array of the `ReflectionInfo` object for the method, by index:

```
obj.reflect.methods["indexOf"].arguments[0];
```

ReflectionInfo object properties

`arguments`	Array of ReflectionInfo	For a reflected method, an array of ReflectionInfo Objects describing each method argument.

`dataType`	String	The data type of the reflected element. One of:
		`boolean`
		`number`
		`string`
		`Classname`: The class name of an object.
		Note: Class names start with a capital letter. Thus, the value `string` stands for a JavaScript string, while `String` is a JavaScript `String` wrapper object.
		*: Any type. This is the default.
		`null`
		`undefined`: Return data type for a function that does not return any value.
		`unknown`

`defaultValue`	any	The default value for a reflected property or method argument, or `undefined` if there is no default value, if the property is undefined, or if the element is a method.
`description`	String	Short text describing the reflected object, or `undefined` if no description is available.

help	String	Longer text describing the reflected object more completely, or `undefined` if no description is available.
isCollection	Boolean	When `true`, the reflected property or method returns a collection; otherwise, `false`.
max	Number	The maximum numeric value for the reflected element, or `undefined` if there is no maximum or if the element is a method.
min	Number	The minimum numeric value for the reflected element, or `undefined` if there is no minimum or if the element is a method.
name	String Number	The name of the reflected element. A string, or a number for an array index.
type	String	The type of the reflected element. One of: `readonly`: A read-only property. `readwrite`: A read-write property. `createonly`: A property that is valid only during creation of an object. `method`: A method.

Localizing ExtendScript Strings

Localization is the process of translating and otherwise manipulating an interface so that it looks as if it had been originally designed for a particular language. ExtendScript gives you the ability to localize the strings in your script's user interface. The language is chosen by the application at startup, according to the current locale provided by the operating system.

For portions of your user interface that are displayed on the screen, you may want to localize the displayed text. You can localize any string explicitly using the Global localize function, which takes as its argument a *localization object* containing the localized versions of a string.

A localization object is a JavaScript object literal whose property names are locale names, and whose property values are the localized text strings. The locale name is a standard language code with an optional region identifier. For details of the syntax, see Locale names.

In this example, a `msg` object contains localized text strings for two locales. This object supplies the text for an alert dialog.

```
msg = { en: "Hello, world", de: "Hallo Welt" };
alert (msg);
```

ExtendScript matches the current locale and platform to one of the object's properties and uses the associated string. On a German system, for example, the property `de: "Hallo Welt"` is converted to the string `"Hallo Welt"`.

Variable values in localized strings

Some localization strings need to contain additional data whose position and order may change according to the language used.

You can include variables in the string values of the localization object, in the form `%n`. The variables are replaced in the returned string with the results of JavaScript expressions, supplied as additional arguments to the `localize` function. The variable `%1` corresponds to the first additional argument, `%2` to the second, and so on.

Because the replacement occurs after the localized string is chosen, the variable values are inserted in the correct position. For example:

```
today = {
   en: "Today is %1/%2.",
   de: "Heute ist der %2.%1."
   };
d = new Date();
alert (localize (today, d.getMonth()+1, d.getDate()));
```

Enabling automatic localization

ExtendScript offers an automatic localization feature. When it is enabled, you can specify a localization object directly as the value of any property that takes a localizable string, without using the `localize` function. For example:

```
msg = { en: "Yes", de: "Ja", fr: "Oui" };
alert (msg);
```

To use automatic translation of localization objects, you must enable localization in your script with this statement:

```
$.localize = true;
```

The `localize` function always performs its translation, regardless of the setting of the `$.localize` variable. For example:

```
msg = { en: "Yes", de: "Ja", fr: "Oui" };
//Only works if the $.localize=true
alert (msg);
//Always works, regardless of $.localize value
alert ( localize (msg));
```

If you need to include variables in the localized strings, use the `localize` function.

Locale names

A locale name is an identifier string in that contains an ISO 639 language specifier, and optionally an ISO 3166 region specifier, separated from the language specifier by an underscore.

- The ISO 639 standard defines a set of two-letter language abbreviations, such as `en` for English and `de` for German.
- The ISO 3166 standard defines a region code, another two-letter identifier, which you can optionally append to the language identifier with an underscore. For example, `en_US` identifies U.S. English, while `en_GB` identifies British English.

This object defines one message for British English, another for all other flavors of English, and another for all flavors of German:

```
message = {
   en_GB: "Please select a colour."
   en: "Please select a colour."
   de: "Bitte wählen Sie eine Farbe."
};
```

If you need to specify different messages for different platforms, you can append another underline character and the name of the platform, one of `Win`, `Mac` , or `Unix`. For example, this objects defines one message in British English to be displayed in Mac OS, one for all other flavors of English in Mac OS, and one for all other flavors of English on all other platforms:

```
pressMsg = {
   en_GB_Mac: "Press Cmd-S to select a colour.",
   en_Mac: "Press Cmd-S to select a color.",
   en: "Press Ctrl-S to select a color."
};
```

All of these identifiers are case sensitive. For example, `EN_US` is not valid.

➤ How locale names are resolved

1. ExtendScript gets the hosting application's locale; for example, `en_US`.
2. It appends the platform identifier; for example, `en_US_Win`.
3. It looks for a matching property, and if found, returns the value string.
4. If not found, it removes the platform identifier (for example, `en_US`) and retries .

5. If not found, it removes the region identifier (for example, `en`) and retries .
6. If not found, it tries the identifier `en` (that is, the default language is English).
7. If not found, it returns the entire localizer object.

Testing localization

ExtendScript stores the current locale in the variable `$.locale`. This variable is updated whenever the locale of the hosting application changes.

To test your localized strings, you can temporarily reset the locale. To restore the original behavior, set the variable to `null`, `false`, 0, or the empty string. An example:

```
$.locale = "ru"; // try your Russian messages
$.locale = null; // restore to the locale of the app
```

Global localize function

The globally available `localize` function can be used to provide localized strings anywhere a displayed text value is specified.

localize

```
localize (localization_obj[, args])
localize (ZString)
```

Returns the localized string for the current locale.

localization_obj

A JavaScript object literal whose property names are locale names, and whose property values are the localized text strings. The locale name is an identifier as specified in the ISO 3166 standard, a set of two-letter language abbreviations, such as "en" for English and "de" for German.

For example:

```
btnText = { en: "Yes", de: "Ja", fr: "Oui" };
b1 = w.add ("button", undefined, localize (btnText));
```

The string value of each property can contain variables in the form %1, %2, and so on, corresponding to additional arguments. The variable is replaced with the result of evaluating the corresponding argument in the returned string.

args

Optional. Additional JavaScript expressions matching variables in the string values supplied in the localization object. The first argument corresponds to the variable %1, the second to %2, and so on.

Each expression is evaluated and the result inserted in the variable's position in the returned string.

➤ **Example**

```
today = {
  en: "Today is %1/%2",
  de: "Heute ist der %2.%1."
  };
d = new Date();
alert (localize (today, d.getMonth()+1, d.getDate()));
```

ZString

Internal use only. A ZString is an internal Adobe format for localized strings, which you might see in Adobe scripts. It is a string that begins with $$$ and contains a path to the localized string in an installed ZString dictionary. For example:

```
w = new Window ("dialog", localize ("$$$/UI/title1=Sample"));
```

User Notification Helper Functions

ExtendScript provides a set of globally available functions that allow you to display short messages to the user in platform-standard dialog boxes. There are three types of message dialogs:

- **Alert**: Displays a dialog containing a short message and an **OK** button.
- **Confirm** : Displays a dialog containing a short message and two buttons, **Yes** and **No**, allowing the user to accept or reject an action.
- **Prompt**: Displays a dialog containing a short message, a text entry field, and **OK** and **Cancel** buttons, allowing the user to supply a value to the script.

These dialogs are customizable to a small degree. The appearance is platform specific.

Global alert function

alert `alert (message[, title, errorIcon]);`	Displays a platform-standard dialog containing a short message and an **OK** button. Returns `undefined`.
message	The string for the displayed message.
title	Optional. A string to appear as the title of the dialog, if the platform supports a title. Mac OS does not support titles for alert dialogs. The default title string is "Script Alert".
errorIcon	Optional. When `true`, the platform-standard alert icon is replaced by the platform-standard error icon in the dialog. Default is `false`.

➤ Examples

This figure shows simple alert dialogs in Windows and Mac OS.

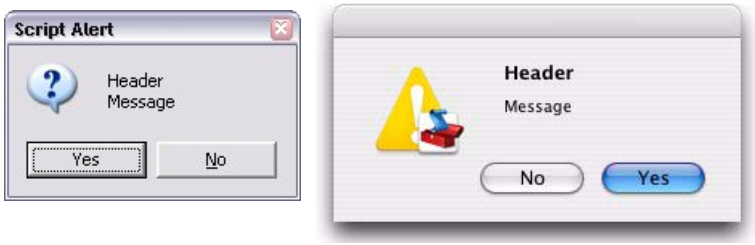
This figure shows alert dialogs with error icons.

Global confirm function

confirm `confirm (message[,noAsDflt ,title ]);`	Displays a platform-standard dialog containing a short message and two buttons labeled **Yes** and **No**. Returns `true` if the user clicked **Yes**, `false` if the user clicked **No**.
message	The string for the displayed message.
noAsDflt	Optional. When `true`, the **No** button is the default choice, selected when the user types ENTER. Default is `false`, meaning that **Yes** is the default choice.
title	Optional. A string to appear as the title of the dialog, if the platform supports a title. Mac OS does not support titles for confirmation dialogs. The default title string is "Script Alert".

➤ Examples

This figure shows simple confirmation dialogs in Windows and Mac OS.



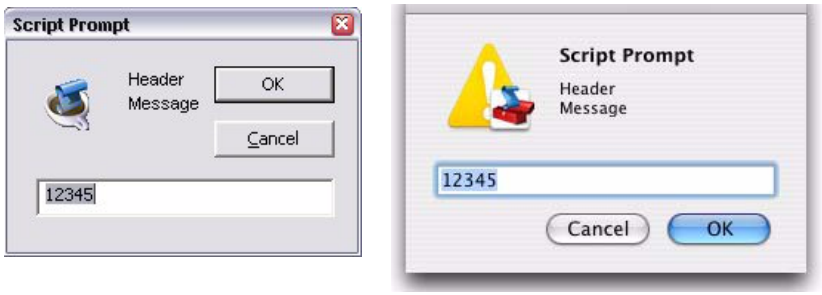
This figure shows confirmation dialogs with **No** as the default button.

Global prompt function

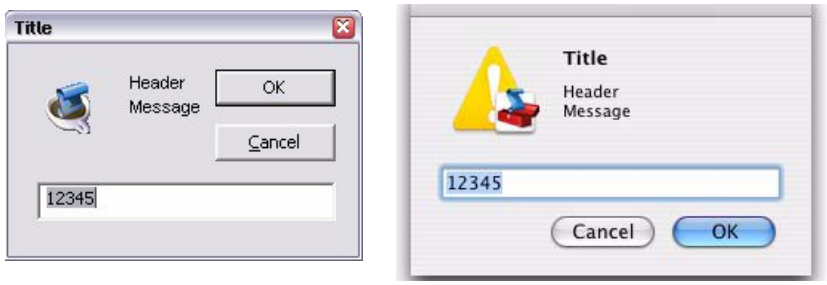
prompt `prompt (message, preset[, title ]);`	Displays a platform-standard dialog containing a short message, a text edit field, and two buttons labeled **OK** and **Cancel**. Returns the value of the text edit field if the user clicked **OK**, `null` if the user clicked **Cancel**.
message	The string for the displayed message.
preset	The initial value to be displayed in the text edit field.
title	Optional. A string to appear as the title of the dialog. In Windows, this appears in the window's frame, while in Mac OS it appears above the message. The default title string is "Script Prompt".

➤ Examples

This figure shows simple prompt dialogs in Windows and Mac OS.



This figure shows confirmation dialogs with a `title` value specified.



Specifying Measurement Values

ExtendScript provides the UnitValue Object to represent measurement values. The properties and methods of the `UnitValue` object make it easy to change the value, the unit, or both, or to perform conversions from one unit to another.

UnitValue Object

Represents measurement values that contain both the numeric magnitude and the unit of measurement.

UnitValue object constructor

The `UnitValue` constructor creates a new `UnitValue` object. The keyword `new` is optional:

```
myVal = new UnitValue (value, unit);
myVal = new UnitValue ("value unit");
myVal = new UnitValue (value, "unit");
```

The *value* is a number, and the *unit* is specified with a string in abbreviated, singular, or plural form, as shown in the following table.

Abbreviation	Singular	Plural	Comments
in	inch	inches	2.54 cm
ft	foot	feet	30.48 cm
yd	yard	yards	91.44 cm
mi	mile	miles	1609.344 m
mm	millimeter	millimeters	
cm	centimeter	centimeters	
m	meter	meters	
km	kilometer	kilometers	
pt	point	points	inches / 72
pc	pica	picas	points * 12
tpt	traditional point	traditional points	inches / 72.27
tpc	traditional pica	traditional picas	12 tpt
ci	cicero	ciceros	12.7872 pt
px	pixel	pixels	baseless (see below)
%	percent	percent	baseless (see below)

If an unknown unit type is supplied, the type is set to `"?"`, and the `UnitValue` object prints as "UnitValue 0.00000".

For example, all of the following formats are equivalent:

```
myVal = new UnitValue (12, "cm");
```

```
myVal = new UnitValue ("12 cm");
myVal = UnitValue ("12 centimeters");
```

UnitValue object properties

baseUnit	UnitValue	A UnitValue Object that defines the size of one pixel, or a total size to use as a base for percentage values. This is used as the base conversion unit for pixels and percentages; see Converting pixel and percentage values. Default is 0.013889 inches (1/72 in), which is the base conversion unit for pixels at 72 dpi. Set to `null` to restore the default.
type	String	The unit type in abbreviated form; for example, "cm" or "in".
value	Number	The numeric measurement value.

UnitValue object functions

as *unitValueObj*.as (*unit*)	Returns the numeric value of this object in the given unit. If the unit is unknown or cannot be computed, generates a run-time error.
unit	The unit type in abbreviated form; for example, "cm" or "in".
convert *unitValueObj*.convert (*unit*)	Converts this object to the given unit, resetting the `type` and `value` accordingly. Returns `true` if the conversion is successful. If the unit is unknown or the object cannot be converted, generates a run-time error and returns `false`.
unit	The unit type in abbreviated form; for example, "cm" or "in".

Converting pixel and percentage values

Converting measurements among different units requires a common base unit. For example, for length, the meter is the base unit. All length units can be converted into meters, which makes it possible to convert any length unit into any other length unit.

Pixels and percentages do not have a standard common base unit. Pixel measurements are relative to display resolution , and percentages are relative to an absolute total size.

- To convert pixels into length units, you must know the size of a single pixel. The size of a pixel depends on the display resolution. A common resolution measurement is 72 dpi, which means that there are 72 pixels to the inch. The conversion base for pixels at 72 dpi is 0.013889 inches (1/72 inch).
- Percentage values are relative to a total measurement. For example, 10% of 100 inches is 10 inches, while 10% of 1 meter is 0.1 meters. The conversion base of a percentage is the unit value corresponding to 100%.

The default `baseUnit` of a `unitValue` object is 0.013889 inches, the base for pixels at 72 dpi. If the `unitValue` is for pixels at any other dpi, or for a percentage value, you must set the `baseUnit` value accordingly. The `baseUnit` value is itself a `unitValue` object, containing both a magnitude and a unit.

For a system using a different dpi, you can change the `baseUnit` value in the `UnitValue` class, thus changing the default for all new `unitValue` objects. For example, to double the resolution of pixels:

```
UnitValue.baseUnit = UnitValue (1/144, "in"); //144 dpi
```

To restore the default, assign `null` to the class property:

```
UnitValue.baseUnit = null; //restore default
```

You can override the default value for any particular `unitValue` object by setting the property in that object. For example, to create a unitValue object for pixels with 96 dpi:

```
pixels = UnitValue (10, "px");
myPixBase = UnitValue (1/96, "in");
pixels.baseUnit = myPixBase;
```

For percentage measurements, set the `baseUnit` property to the measurement value for 100%. For example, to create a `unitValue` object for 40 % of 10 feet:

```
myPctVal = UnitValue (40, "%");
myBase = UnitValue (10, "ft")
myPctVal.baseUnit = myBase;
```

Use the as method to get to a percentage value as a unit value:

```
myFootVal = myPctVal.as ("ft"); // => 4
myInchVal = myPctVal.as ("in"); // => 36
```

You can convert a `unitValue` from an absolute measurement to pixels or percents in the same way:

```
myMeterVal = UnitValue (10, "m"); // 10 meters
myBase = UnitValue (1, "km");
myMeterVal.baseUnit = myBase; //as a percentage of 1 kilometer
pctOfKm = myMeterVal.as ('%'); // => 1

myVal = UnitValue ("1 in"); // Define measurement in inches
// convert to pixels using default base
myVal.convert ("px"); // => value=72 type=px
```

Computing with unit values

`UnitValue` objects can be used in computational JavaScript expressions. The way the value is used depends on the type of operator.

- Unary operators (`~`, `!`, `+`, `-`)

`~`*unitValue*	The numeric value is converted to a 32-bit integer with inverted bits.
`!`*unitValue*	Result is `true` if the numeric value is nonzero, `false` if it is not.
`+`*unitValue*	Result is the numeric value.
`-`*unitValue*	Result is the negated numeric value.

- Binary operators (+, -, *, /, %)

  If one operand is `unitValue` object and the other is a number, the operation is applied to the number and the numeric value of the object. The expression returns a new `unitValue` object with the result as its `value`. For example:

  ```
  val = new UnitValue ("10 cm");
  res = val * 20;
  // res is a UnitValue (200, "cm");
  ```

  If both operands are `unitValue` objects, JavaScript converts the right operand to the same unit as the left operand and applies the operation to the resulting values. The expression returns a new `unitValue` object with the unit of the left operand, and the result `value`. For example:

  ```
  a = new UnitValue ("1 m");
  b = new UnitValue ("10 cm");
  a + b;
  // res is a UnitValue (1.1, "m");
  b + a;
  // res is a UnitValue (110, "cm");
  ```

- Comparisons (=, ==, <, >, <=, >=)

  If one operand is a `unitValue` object and the other is a number, JavaScript compares the number with the `unitValue`'s numeric value.

  If both operands are `unitValue` objects, JavaScript converts both objects to the same unit, and compares the converted numeric values.

  For example:

  ```
  a = new UnitValue ("98 cm");
  b = new UnitValue ("1 m");
  a < b;   // => true
  a < 1;   // => false
  a == 98; // => true
  ```

Modular Programming Support

ExtendScript provides support for a modular approach to scripting by allowing you to include one script in another as a resource, and allowing a script to export definitions that can be imported and used in another script.

Preprocessor directives

ExtendScript provides preprocessor directives for including external scripts, naming scripts, specifying an ExtendScript engine, and setting certain flags. You can specify these in two ways:

- With a C-style statement starting with the `#` character:

```
#include "file.jsxinc"
```

- In a comment whose text starts with the `@` character:

```
// @include "file.jsxinc"
```

When a directive takes one or more arguments, and an argument contains any nonalphanumeric characters, the argument must be enclosed in single or double quotes. This is generally the case with paths and file names, for example, which contain dots and slashes.

`#engine` ***`name`***	Identifies the ExtendScript engine that runs this script. This allows other engines to refer to the scripts in this engine by importing the exported functions and variables. See Importing and exporting between scripts.
	Use JavaScript identifier syntax for the name. Enclosing quotes are optional. For example:
	`#engine library`
	`#engine "$lib"`

`#include` ***`file`***	Includes a JavaScript source file from another location. Inserts the contents of the named file into this file at the location of this statement. The *`file`* argument is an Adobe portable file specification. See Specifying Paths. As a convention, use the file extension `.jsxinc` for JavaScript include files. For example: `#include "../include/lib.jsxinc"` To set one or more paths for the `#include` statement to scan, use the `#includepath` preprocessor directive. If the file to be included cannot be found, ExtendScript throws a run-time error. Included source code is not shown in the debugger, so you cannot set breakpoints in it.

#includepath *path*	One or more paths that the #include statement should use to locate the files to be included. The semicolon (;) separates path names.
	If a #include file name starts with a slash (/), it is an absolute path name, and the include paths are ignored. Otherwise, ExtendScript attempts to find the file by prefixing the file with each path set by the #includepath statement.
	For example:
	`#includepath "include;../include"`
	`#include "file.jsxinc"`
	Multiple #includepath statements are allowed; the list of paths changes each time an #includepath statement is executed.
	As a fallback, ExtendScript also uses the contents of the environment variable JSINCLUDE as a list of include paths.
	Some engines can have a predefined set of include paths. If so, the path provided by #includepath is tried before the predefined paths. If, for example, the engine has a predefined path set to predef;predef/include, the preceding example causes the following lookup sequence:
	file.jsxinc: literal lookup
	include/file.jsxinc: first #includepath path
	../include/file.jsxinc: second #includepath path
	predef/file.jsxinc: first predefined engine path
	predef/include/file.jsxinc: second predefined engine path

#script *name*	Names a script. Enclosing quotes are optional, but required for names that include spaces or special characters. For example:
	`#script SetupPalette`
	`#script "Load image file"`
	The *name* value is displayed in the Toolkit Editor tab. An unnamed script is assigned a unique name generated from a number.

#strict on	Turns on strict error checking. See the Dollar ($) Object's strict property.
#target *name*	Defines the target application of this JSX file. The *name* value is an application specifier; see Application and Namespace Specifiers. Enclosing quotes are optional. If the Toolkit is registered as the handler for files with the .jsx extension (as it is by default), opening the file opens the target application to run the script. If this directive is not present, the Toolkit loads and displays the script. A user can open a file by double-clicking it in a file browser, and a script can open a file using a File object's execute method.

Importing and exporting between scripts

The ExtendScript JavaScript language has been extended to support function calls and variable access across various source code modules and ExtendScript engines. A script can use the export statement to make its definitions available to other scripts, which use the import statement to access those definitions.

To use this feature, the exporting script must name its ExtendScript engine using the #engine preprocessor statement. The name must follow JavaScript naming syntax; it cannot be an expression.

For example, the following script could serve as a library or resource file. It defines and exports a constant and a function:

```
#engine library
export random, libVersion;
const libVersion = "Library 1.0";
function random (max) {
   return Math.floor (Math.random() * max);
}
```

A script running in a different engine can import the exported elements. The import statement identifies the resource script that exported the variables using the engine name:

```
import library.random, library.libVersion;
print (random (100));
```

You can use the asterisk wildcard (`*`) to import all symbols exported by a library:

```
import library.*
```

Objects cannot be transferred between engines. You cannot retrieve or store objects, and you cannot call functions with objects as arguments. However, you can use the JavaScript `toSource` function to serialize objects into strings before passing them. You can then use the JavaScript `eval` function to reconstruct the object from the string.

For example, this function takes as its argument a serialized string and constructs an object from it:

```
function myFn (serialized) {
   var obj = eval (serialized);
   // continue working…
}
```

In calling the function, you deconstruct the object you want to pass into a serialized string:

```
myFn (myObject.toSource()); // pass a serialized object
```

Operator Overloading

ExtendScript allows you to extend or override the behavior of a math or a Boolean operator for a specific class by defining a method in that class with same name as the operator. For example, this code defines the addition (+) operator for the class `MyClass`. In this case, the addition operator simply adds the operand to the property value:

```
// define the constructor method
function MyClass (initalValue) {
   this.value = initialValue;
}
// define the addition operator
MyClass.prototype ["+"] = function (operand) {
   return this.value + operand;
}
```

This allows you to perform the "+" operation with any object of this class:

```
var obj = new MyClass (5);
Result: [object Object]
obj + 10;
Result: 15
```

You can override the following operators:

Unary	+, - ~
Binary	+, - *, /, %, ^ <, <=, == <<, >>, >>>> &, |, ===

- The operators > and >= are implemented by executing NOT operator <= and NOT operator <.
- Combined assignment operators such as *= are not supported.

All operator overload implementations must return the result of the operation. To perform the default operation, return `undefined`.

Unary operator functions work on the `this` object, while binary operators work on the `this` object and the first argument. The + and - operators have both unary and binary implementations. If the first argument is undefined, the operator is unary; if it is supplied, the operator is binary.

For binary operators, a second argument indicates the order of operands. For noncommutative operators, either implement both order variants in your function or return `undefined` for combinations that you do not support. For example:

```
this ["/"] = function (operand, rev) {
   if (rev) {
       // do not resolve operand / this
       return;
   } else {
       // resolve this / operand
       return this.value / operand;
   }
}
```

Application and Namespace Specifiers

All forms of interapplication communication use Application specifiers to identify Adobe applications.

- In all ExtendScript scripts, the `#target` directive can use an specifier to identify the application that should run that script. See Preprocessor directives.
- In interapplication messages, the specifier is used as the value of the `target` property of the message object, to identify the target application for the message.
- Bridge (which is integrated with all Adobe Creative Suite 2 applications) uses an application specifier as the value of the `document.owner` property, to identify another Creative Suite 2 application that created or opened a Bridge browser window. For details, see the *Bridge JavaScript Reference*, available with Adobe Creative Suite 2.

When a script for one application invokes Cross-DOM or exported functions, it identifies the exporting application using Namespace specifiers.

Application specifiers

Application specifiers are strings that encode the application name, a version number and a language code. They take the following form:

appname[-*version*[-*locale*]]

appname	An Adobe application name. One of:
	`acrobat`
	`aftereffects`
	`atmosphere`
	`audition`
	`bridge`
	`encore`
	`golive`
	`illustrator`
	`incopy`
	`indesign`
	`photoshop`
	`premiere`

version	Optional. A number indicating at least a major version. If not supplied, the most recent version is assumed. The number can include a minor version separated from the major version number by a dot; for example, `1.5`.
locale	Optional. An Adobe locale code, consisting of a 2-letter ISO-639 language code and an optional 2-letter ISO 3166 country code separated by an underscore. Case is significant. For example, `en_US`, `en_UK`, `ja_JP`, `de_DE`, `fr_FR`. If not supplied, ExtendScript uses the current platform locale. Do not specify a locale for a multilingual application, such as Bridge, that has all locale versions included in a single installation.

The following are examples of legal specifiers:

```
photoshop
bridge-1
bridge-1.0
illustrator-12.2
bridge-1-en_us
golive-8-de_de
```

Namespace specifiers

When calling cross-DOM and exported functions from other applications, a namespace specifier qualifies the function call, directing it to the appropriate application.

Namespace specifiers consist of an application name, as used in an application specifier, with an optional major version number. Use it as a prefix to an exported function name, with the JavaScript dot notation.

```
appname[majorVersion].functionName(args)
```

For example:

- To call the cross-DOM function `quit` in Photoshop CS2, use `photoshop.quit()`, and to call it in GoLive® CS2, use `golive.quit()`.
- To call the exported function `place`, defined for Illustrator CS version 12, call `illustrator12.place(myFiles)`.

For information about the cross-DOM and exported functions, see the *Bridge JavaScript Reference*, available with Adobe Creative Suite 2.

Script Locations and Checking Application Installation

On startup, all Adobe Creative Suite 2 applications execute all JSX files that they find in the user startup folder:

- In Windows, the startup folder is:

  ```
  %APPDATA%\Adobe\StartupScripts
  ```

- In Mac OS®, the startup folder is

  ```
  ~/Library/Application Support/Adobe/StartupScripts/
  ```

A script in the startup directory is executed on startup by all applications. If you place a script here, it must contain code to check whether it is being run by the intended application. You can do this using the `appName` static property of the `BridgeTalk` class. For example:

```
if( BridgeTalk.appName == "bridge" ) {
      //continue executing script
   }
```

In addition, individual applications may look for application-specific scripts in a subfolder named with that application's specifier and version, in the form:

```
%APPDATA%\Adobe\StartupScripts\appname\version
~/Library/Application Support/Adobe/StartupScripts/appname/version/
```

The name and version in these folder names are specified in the form required for Application specifiers. For example, in Windows, GoLive CS2 version 8.2 would look for scripts in the directory:

```
%APPDATA%\Adobe\StartupScripts\golive\8.2
```

The *version* portion of the Bridge-specific folder path is an exact version number. That is, scripts in the folder `bridge/1.5` are executed only by Bridge version 1.5, and so on.

Individual applications may also implement a path in the installation directory for application-specific startup scripts. For example:

```
IllustratorCS2_install_dir\Startup Scripts
IllustratorCS2_install_dir/Startup Scripts/
```

If a script that is run by one application will communicate with another application, or add functionality that depends on another application, it must first check whether that application and version is installed. You can do this using the `BridgeTalk.getSpecifier` static function. For example:

```
if( BridgeTalk.appName == "bridge" ) {
// Check that PS CS2 is installed
   if( BridgeTalk.getSpecifier("photoshop",9)){
       // add PS automate menu to Bridge UI
   }
}
```

For details of interapplication communication, see the *Bridge JavaScript Reference*, available with Adobe Creative Suite 2.

Appendix A: Event ID Codes

The following table lists events and their four-character ID codes or string identifiers for use with the `notifier` object.

Note: Do not include single quotes (') with four-character IDs in your code. The single quotes are used in this table to illustrate the placement of required spaces in codes that do not contain four letters. However, string identifiers, which are longer than four characters, require double quotes in the code.

Event	4-char ID or String
3DTransform	'TdT '
Average	'Avrg'
ApplyStyle	'ASty'
Assert	'Asrt'
AccentedEdges	'AccE'
Add	'Add '
AddNoise	'AdNs'
AddTo	'AddT'
Align	'Algn'
All	'All '
AngledStrokes	'AngS'
ApplyImage	'AppI'
BasRelief	'BsRl'
Batch	'Btch'
BatchFromDroplet	'BtcF'
Blur	'Blr '
BlurMore	'BlrM'
Border	'Brdr'
Brightness	'BrgC'
CanvasSize	'CnvS'
ChalkCharcoal	'ChlC'
ChannelMixer	'ChnM'
Charcoal	'Chrc'
Chrome	'Chrm'
Clear	'Cler'

Event	4-char ID or String
Close	'Cls '
Clouds	'Clds'
ColorBalance	'ClrB'
ColorHalftone	'ClrH'
ColorRange	'ClrR'
ColoredPencil	'ClrP'
ContactSheet	"0B71D221-F8CE-11d2-B21B-0008C75B322C"
ConteCrayon	'CntC'
Contract	'Cntc'
ConvertMode	'CnvM'
Copy	'copy'
CopyEffects	'CpFX'
CopyMerged	'CpyM'
CopyToLayer	'CpTL'
Craquelure	'Crql'
CreateDroplet	'CrtD'
Crop	'Crop'
Crosshatch	'Crsh'
Crystallize	'Crst'
Curves	'Crvs'
Custom	'Cstm'
Cut	'cut '
CutToLayer	'CtTL'
Cutout	'Ct '
DarkStrokes	'DrkS'
DeInterlace	'Dntr'
DefinePattern	'DfnP'
Defringe	'Dfrg'
Delete	'Dlt '
Desaturate	'Dstt'
Deselect	'Dslc'
Despeckle	'Dspc'
DifferenceClouds	'DrfC'

Event	4-char ID or String
Diffuse	'Dfs '
DiffuseGlow	'DfsG'
DisableLayerFX	'dlfx'
Displace	'Dspl'
Distribute	'Dstr'
Draw	'Draw'
DryBrush	'DryB'
Duplicate	'Dplc'
DustAndScratches	'DstS'
Emboss	'Embs'
Equalize	'Eqlz'
Exchange	'Exch'
Expand	'Expn'
Export	'Expr'
Jumpto	'Jpto'
ExportTransparentImage	"02879e00-cb66-11d1-bc43-0060b0a13dc4"
Extrude	'Extr'
Facet	'Fct '
Fade	'Fade'
Feather	'Fthr'
Fibers	'Fbrs'
Fill	'Fl '
FilmGrain	'FlmG'
Filter	'Fltr'
FindEdges	'FndE'
FitImage	"3caa3434-cb67-11d1-bc43-0060b0a13dc4"
FlattenImage	'FltI'
Flip	'Flip'
Fragment	'Frgm'
Fresco	'Frsc'
GaussianBlur	'GsnB'
Get	'getd'
Glass	'Gls '

Event	4-char ID or String
GlowingEdges	'GlwE'
Gradient	'Grdn'
GradientMap	'GrMp'
Grain	'Grn '
GraphicPen	'GraP'
Group	'GrpL'
Grow	'Grow'
HalftoneScreen	'HlfS'
Hide	'Hd '
HighPass	'HghP'
HSBHSL	'HsbP'
HueSaturation	'HStr'
ImageSize	'ImgS'
Import	'Impr'
InkOutlines	'InkO'
Intersect	'Intr'
IntersectWith	'IntW'
Inverse	'Invs'
Invert	'Invr'
LensFlare	'LnsF'
Levels	'Lvls'
LightingEffects	'LghE'
Link	'Lnk '
Make	'Mk '
Maximum	'Mxm '
Median	'Mdn '
MergeLayers	'Mrg2'
MergeLayersOld	'MrgL'
MergeSpotChannel	'MSpt'
MergeVisible	'MrgV'
Mezzotint	'Mztn'
Minimum	'Mnm '
ModeChange	"8cba8cd6-cb66-11d1-bc43-0060b0a13dc4"

Event	4-char ID or String
Mosaic	'Msc '
Mosaic_PLUGIN	'MscT'
MotionBlur	'MtnB'
Move	'move'
NTSCColors	'NTSC'
NeonGlow	'NGlw'
Next	'Nxt '
NotePaper	'NtPr'
Notify	'Ntfy'
Null	typeNull
OceanRipple	'OcnR'
Offset	'Ofst'
Open	'Opn '
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