

DESIGNER SCRIPTING BASICS

For legal notices, see <https://helpx.adobe.com/legal/legal-notices.html>.

Contents

Chapter 1: About This Document

Purpose and scope	1
Additional information	1

Chapter 2: Scripting Using Designer

How scripting works	3
Objects that support calculations and scripts	4
Understanding relationships between objects in the Object Library	4
Script Editor	6

Chapter 3: Configuring Designer for Scripting

To show the Script Editor	8
To change from single-line to multiline view	8
To set the default scripting language for new forms	8
To set the default scripting language for the current form	8
To set the default scripting language for a form template	8
To set the default processing application	9
To change the default processing application for a form template	9
To display Arabic, Hebrew, Thai, and Vietnamese characters	9
Using the workspace to debug calculations and scripts	10

Chapter 4: Creating Calculations and Scripts

Naming conventions for form design objects and variables	12
Choosing a scripting language	13
To create a calculation or script	14
To find text or other items	15
To replace text or other items	15
To use statement completion to create calculations and scripts	16
To insert object reference syntax automatically	16
Determining when to run your calculation or script	17
To view scripting events and scripts	18
Determining where to run your calculation or script	19
Testing and debugging calculations and scripts	19
To check script syntax	20
Working around security restrictions	21

Chapter 5: Events

Types of events	22
Process events	22
Interactive events	24
Application events	27
calculate event	29
change event	30
click event	31

docClose event	32
docReady event	32
enter event	33
exit event	34
form:ready event	34
full event	35
indexChange event	36
initialize event	36
layout:ready event	37
mouseDown event	38
mouseEnter event	39
mouseExit event	39
mouseUp event	40
postOpen event	41
postPrint event	41
postSave event	42
postSign event	43
postSubmit event	43
preOpen event	44
prePrint event	45
preSave event	45
preSign event	46
preSubmit event	47
validate event	47

Chapter 6: Scripting with FormCalc and JavaScript

Using FormCalc	53
Using built-in functions	53
Creating basic calculations	54
Using JavaScript	56
Creating scripts using JavaScript	57
Enforcing strict scoping rules in JavaScript	57
To attach a JavaScript script to an object	61

Chapter 7: Variables

Naming variables	62
To define a text variable	62
To view a text variable definition	63
To delete a text variable	63
Using variables in calculations and scripts	63

Chapter 8: Referencing Objects in Calculations and Scripts

Referencing object properties and values	65
Referencing unnamed and repeated objects	67
Referencing the current object	69
FormCalc reference syntax shortcuts	69

Chapter 9: Creating and Reusing JavaScript Functions

To create a script object	76
To add script to a script object	77
To reference JavaScript functions stored in a script object	77

Chapter 10: Using Script Fragments

Script fragment properties	78
To create a script fragment	78
To insert a script fragment	79

Chapter 11: Debugging Calculations and Scripts

JavaScript Debugging	81
Debugging tips	83

Chapter 12: Working with a Host Application

Host scripting model properties and methods	86
Comparing the host scripting model functionality	87

Chapter 13: Working with the Event Model

Event model properties and methods	89
--	----

Chapter 14: Moving from Scripting in Acrobat to Designer

Converting Acrobat forms that contain scripts	90
Using JavaScript objects from Acrobat in Designer	91
JavaScript objects from Acrobat supported in Designer	92

Chapter 15: Examples of Common Scripting Tasks

Changing the background colors of fields, fillable areas, and subforms	103
Hiding and showing objects	105
Excluding an object from the tabbing order	110
Changing the visual properties of an object on the client	111
Getting the current or previous value of a drop-down list	114
Preserving rich text formatting when copying field values	116
Adjusting the height of a field at run time	116
Setting a field as required at run time	117
Calculating the field sums	118
Highlighting fields in response to form filler interaction	119
Resetting the values of the current subform	122
Changing the presence of a form design object	123
Using the properties of the instance manager to control subforms	124
Using the methods of the instance manager to control subforms	126
Using the instance manager to control subforms at run time	128

Chapter 1: About This Document

Welcome to Designer Scripting Basics. *Scripting Basics* provides you with an overview of how you can use Designer calculations and scripts to develop and extend forms created in Designer.

You can use calculations and scripts to perform these types of actions:

- Change the behavior and appearance of objects at run time
- Control the presentation of field values
- Provide interaction with form fillers using dialog boxes and visual cues
- Automate form filling
- Control the hosting environment
- Interact with web services
- Interacting with databases and populate forms with data from data sources

Purpose and scope

Scripting Basics is intended for form authors and form developers interested in using calculations and scripts to extend their Designer forms. It is assumed that you have a working knowledge of scripting languages, especially JavaScript™, as well as object models. You should also be familiar with Adobe® Acrobat® Professional or Acrobat Standard and be comfortable working in a structured XML environment.

Scripting Basics provides the following information:

- An introduction to using Designer calculations and scripts to extend your forms
- Easily understood, detailed information and examples of the Designer calculation and scripting features
- References to other resources where you can learn more about Designer scripting and related technologies

After reading this guide, you should be equipped to start using Designer calculations and scripts. During the development process, you will find that the descriptions and examples in this guide will provide you with enough direction and background to enable you to successfully complete your projects.

Additional information

Adobe has a wide variety of resources dedicated to Designer scripting focused at both the form author and the form developer audiences.

Designer Help

Contains detailed information about using the product, including information on using calculations and scripts, and should be the first place you search for information on any topics related to Designer. You can access *Designer Help* from the Help menu.

Scripting Basics

Provides an overview of creating calculations and scripts for use with Designer. This guide is intended to help you create calculations and scripts using FormCalc and JavaScript.

Scripting Reference

The Scripting Reference is a detailed reference of the models, objects, properties, and methods that you can use with Designer. This PDF is intended as reference material only; it is not intended to give users information on how to create calculations or scripts.

See [Scripting Reference](#).

User Forums

The Designer Forum is a meeting place for professionals who are interested in discussing issues related to Designer. Respond to reader questions, report bugs or issues with the product, or post questions of your own to other form designers and Adobe experts. For information, see www.adobeforums.com.

Scripting samples

The scripting samples are working forms or packages that include instructions on how the sample was created and any sample data used to create and view the form. New samples are added on an ongoing basis by both Adobe experts and third-party organizations. See the [Developer Center](#).

Chapter 2: Scripting Using Designer

As part of the form design process, a form developer can use calculations and scripts to provide a richer user experience. You can add calculations and scripts to most form fields and objects. For example, the following JavaScript script multiplies the values of two numeric fields together and displays the result in a third numeric field:

```
NumericField3.rawValue = NumericField1.rawValue * NumericField2.rawValue;
```

At a more advanced level, you can create your own functions tailored towards your own custom form processing needs.

Designer supports two scripting languages, each geared towards the needs of a particular type of form developer. FormCalc is a straightforward, easy-to-use calculation language that is modelled on common spreadsheet functionality. It includes a variety of built-in functions designed to reduce the amount of time you need to spend developing your form design. JavaScript, a powerful scripting language, provides you with a great deal of flexibility when creating your scripts and allows you to leverage any existing knowledge of the language.

Remember that scripting on a form is entirely optional. You can choose to take advantage of scripting to provide a richer user experience, but many of the most powerful features available during form creation are available in Designer without the use of scripts. However, through scripting, you can manipulate and control almost all aspects of your form design.

Note: You can also use the Action Builder dialog box on the Tools menu to build common interactive capabilities in forms that have a flowable layout, without writing scripts.

How scripting works

Designer scripting uses an event-based model that allows you to alter various aspects of objects on a form at run time. As a form designer, you add scripts to objects based on when you want the script to execute. For example, you might place the following script on the `click` event of a button object so that at run time, when a user clicks the button, a message box appears with a message:

```
xfa.host.messageBox("This is a message for a form filler.", "User Feedback", 3);
```

Scripts associated with a particular event execute whenever that event occurs. Some events can occur multiple times within the same form filling session. For example, the following script adds one to the current value of a numeric field:

```
NumericField1.rawValue = NumericField1.rawValue + 1;
```

If you add this script to the `calculate` event for `NumericField1`, when you open the form for the first time, `NumericField1` displays the value 2. This indicates that the `calculate` event occurred twice in the sequence of events that occurred when the form was opened.

More Help topics

[“Events” on page 22](#)

[“Objects that support calculations and scripts” on page 4](#)

[“Understanding relationships between objects in the Object Library” on page 4](#)

Objects that support calculations and scripts

The following table provides a quick reference of scripting support for the standard objects that are included in the Library palette in Designer.

Objects that support calculations and scripts	Objects that do not support calculations and scripts
Barcodes	Circle
Button	Content Area
Check Box	Line
Date/Time Field	Rectangle
Decimal Field	Image
Signature Field	Subform Sets
Drop-Down List	Table sections
Email Submit Button	Text
HTTP Submit Button	
Image Field	
List Box	
Numeric Field	
Paper Forms Barcode	
Password Field	
Print Button	
Radio Button	
Reset Button	
Subform	
Table (including body rows, header rows, and footer rows)	
Text Field	

More Help topics

[“Understanding relationships between objects in the Object Library” on page 4](#)

Understanding relationships between objects in the Object Library

When you create calculations and scripts in Designer, you should be aware that the objects on which you are adding scripts are actually defined as XML objects in the underlying XML Forms Architecture. That means while the Standard tab of the Object Library palette contains a wide variety of objects, many of those objects are defined by the same XML object. As a result, the various scripting properties and methods that are available are based on the definition of the XML object, and not the object in the Object Library palette.

Objects available in the Standard tab of the Object Library palette that are based on the same base XML object definition share a set of common properties and methods. If you are referring to the [Scripting Objects](#) section, you determine the set of properties and methods available based on the corresponding base XML object. Similarly, each base XML object definition contains a child object that specifically controls the visual appearance of the Designer object.

For example, if you want to browse the properties and methods that are available for a Date/Time Field object in Designer, you would start with the [field](#) object. If you want to browse the corresponding XML object that controls the visual appearance of the Date/Time Field, view the [dateTimeEdit](#) object.

The table below illustrates the mapping between objects that you see in the Standard tab of the Object Library palette in Designer, and the corresponding XML Form Architecture object.

Standard Object Library Object	XML Form Architecture Object (Base)	XML Form Architecture Object (UI)
Barcodes	field	barcode
Button	field	button
Check Box	field	checkButton
Date/Time Field	field	dateTime
Decimal Field	field	numericEdit
Signature Field	field	signature
Drop-Down List	field	choiceList
Email Submit Button	field	button
HTTP Submit Button	field	button
Image Field	field	imageEdit
List Box	field	choiceList
Numeric Field	field	numericEdit
Paper Forms Barcode	field	barcode
Password Field	field	passwordEdit
Print Button	field	button
Radio Button	field	checkButton
Reset Button	field	button
Subform	subform	N/a
Table (including body rows, header rows, and footer rows)	subform	N/a
Text Field	field	textEdit

More Help topics

[“Objects that support calculations and scripts” on page 4](#)

Script Editor

The Script Editor is where you create, modify, and view the calculations and scripts of a particular form. For example, you can use the Script Editor to write a simple calculation that adds two numeric fields or complex scripts that alter the appearance of the form based on end-user actions. Designer supports scripting either in its own scripting language called FormCalc or in JavaScript.

By default, the Script Editor appears at the top of the Designer workspace, but you can dock it anywhere. It has both a single-line view and a multiline view that you can switch between, depending on your needs. Single-line view is designed to maximize the amount of space dedicated to the Layout Editor and other palettes. Multiline view is designed to maximize the amount of space for writing script.

Show Lists all form design events that support user-defined scripting. Any events that do not apply to a particular object appear dimmed. Events that contain a calculation or script display an asterisk (*) beside the name of the event.

Show Events for Child Objects  Displays the event you have currently selected in the Show list for the current object and all of its child objects. If you select the uppermost object in the Hierarchy palette, this option displays the event you have currently selected in the Show list for all objects on your form.

Functions  Displays a list of available built-in FormCalc or JavaScript functions, depending on the scripting language you currently have selected in the Language list.

To place a function onto your script editing field, select a function from the list and press Enter.

Check Script Syntax  Checks all of the scripts in a form for correct syntax and reports any errors on the Warnings tab in the Report palette.

Language Specifies the scripting language you want to use for the current calculation or script. Two options are available:

- **FormCalc** FormCalc is a native Adobe calculation language typically used for shorter scripts, such as simple calculations.
FormCalc is the default scripting language for new forms. (See “[To set the default scripting language for new forms](#)” on page 8.)
- **JavaScript** JavaScript is a robust and flexible scripting language suitable for more complex scripts.

The scripting language that is displayed in the Language list matches the scripting language option you select as the default for new forms in the Workspace panel in the Options dialog box. However, if you change the scripting language setting for the current form on the Defaults tab in the Form Properties dialog box, the scripting language that is displayed in the Language list changes similarly for any new scripts on new events. Changing the scripting language option in the Form Properties dialog box does not change the scripting language for existing scripts. If an event already contains script and that script is deleted, the Script Editor continues to use that same scripting language for the duration of your Designer working session.

Run At Specifies where the calculation or script will execute. Three options are available:

- **Client** Calculations and scripts execute while the client application (for example, Acrobat or web browser) processes the form.
- **Server** Calculations and scripts execute while the server application (for example, Adobe document services) processes the form.
- **Client and server** Calculations and scripts execute while the server application (for example, Adobe document services) processes the form. For example, a script that accesses a database to pre-fill data on a form.

Event Propagation To see the Event Propagation checkbox go to Tools > Options dialog and in the Workspace tab, select the Display Event Propagation Option checkbox.

You can make your scripts global, by enabling event propagation in the Script Editor. The setting allows form events to propagate to ancestor containers. Event propagation can reduce the number of scripts in a form. For example, you can create a global script to control the appearance of invalid fields, subforms, or exclusion groups. A few examples of global events are:

- An enter/exit/mouseEnter/mouseExit event that colors the active field.
- A change event that track keystrokes for a form session.

Chapter 3: Configuring Designer for Scripting

To show the Script Editor

- ❖ Select Window > Script Editor.

Note: You can use the Expand button to quickly dock or undock the Script Editor when it is displayed in the Designer workspace.

To change from single-line to multiline view

- ❖ Drag the Script Editor palette bar until the palette is the required size.

Note: Multiline view adds the All Events and Events with Scripts options to the Show list. The All Events option displays all of the events for a particular form design object, even if the events do not contain any calculations or scripts. The Events with Scripts option displays only those events of a particular object that contain calculations or scripts.

To set the default scripting language for new forms

- 1 Select Tools > Options.
- 2 Click Workspace.
- 3 In the Default Language For New Forms list, select the default scripting language for new forms.

To set the default scripting language for the current form

- 1 Select Edit > Form Properties.
- 2 Click the Defaults tab.
- 3 In the Default Language list, select the default scripting language for the currently displayed form.

To set the default scripting language for a form template

- 1 Create a new form design.
- 2 Select Edit > Form Properties.

- 3 Click the Defaults tab.
- 4 Select your default scripting language from the Default Language list.
- 5 Make a backup of the original form template file located in the Templates folder where Designer is installed.
- 6 Save the new form design as a TDS file and overwrite the corresponding form template. For example, save the file as Letter.tds and overwrite the Letter.tds file located in Templates\Blank folder.

To set the default processing application

- 1 Select Edit > Form Properties.
- 2 Click the Defaults tab.
- 3 Select your default processing application from the Default Run At list.

Note: This procedure only sets the value of the default processing application for the current instance of the form.

To avoid changing the default processing application each time you create a form, you must modify the corresponding form template file that is used to create a new form design.

To change the default processing application for a form template

- 1 Create a new form design.
- 2 Select Edit > Form Properties.
- 3 Click the Defaults tab.
- 4 Select your default processing application from the Default Run At list.
- 5 Make a backup of the original form template file located in the Templates folder where Designer is installed.
- 6 Save the new form design as a TDS file and overwrite the corresponding form template. For example, save the file as Letter.tds and overwrite the Letter.tds file located in Templates\Blank folder.

To display Arabic, Hebrew, Thai, and Vietnamese characters

To display Arabic, Hebrew, Thai, and Vietnamese characters in the Script Editor or XML Source tab, you must change the font settings that Designer uses in these tabs. Otherwise, Designer displays rectangles where the language-specific characters should be.

- 1 Select Tools > Options and select Workspace from the list on the left.
- 2 Select one of the following options:
 - FormCalc Syntax Formatting to set the font in the Script Editor when you use FormCalc
 - JavaScript Syntax Formatting to set the font in the Script Editor when you use JavaScript
 - XML Source Syntax Formatting to set the font in the XML Source tab

- 3 In the Font box, select a font that supports your language. For example, Adobe Arabic supports Arabic, Adobe Hebrew supports Hebrew, Adobe Thai supports Thai, and Myriad® Pro and Minion® Pro support Vietnamese. You can locate the font you need for your language on the Internet if it is not already on your system.
- 4 Click OK.
- 5 Click OK to close the Options dialog box.

Using the workspace to debug calculations and scripts

The Designer workspace provides a number of ways to assist you with debugging your calculations and scripts.

The following table provides the location and purpose of some helpful debugging information located on various Designer palettes and tabs.

Workspace location	Purpose
Warnings tab in the Report palette	<p>Displays target and warning marker messages as well as all JavaScript or FormCalc scripting syntax errors when you select the Check Script Syntax command from the Tools menu or click the Check Script Syntax button in the Tools toolbar. For more information, see “To check script syntax” on page 20.</p> <p>When you double-click a syntax warning message in the Warnings tab, the script that contains the error is loaded into the Script Editor, and the line with the error is highlighted.</p> <p>You can also double-click a warning message to select the related object in the Design View and the Hierarchy palette, and press F1 to display information about how to fix the warnings.</p> <p>To check for JavaScript run-time errors, you can activate the JavaScript Console. For more information, see “JavaScript Debugging” on page 81.</p>
Binding tab in the Report palette	If you include fields on your form design that are bound to a data source, the Binding tab can assist you by displaying lists of fields based on how you defined their data binding. For example, you can list only fields with Global Data Binding or only those with no data binding defined. This feature is especially useful on forms that have a large number of data bound fields.
Log tab in the Report palette	Displays validation messages, JavaScript or FormCalc scripting execution errors, and design-time form rendering errors generated by Designer when you import or save a form, or preview a form using the Preview PDF tab.

Workspace location	Purpose
Hierarchy palette	<p>You can use the Hierarchy palette to determine the location of a form object for a reference syntax. The Hierarchy palette is a graphical representation of the structure of a form. It displays the contents of the Master Pages and Design View tabs.</p> <p>The Hierarchy palette also displays referenced objects under the Referenced Objects node. A <i>referenced object</i> is an object that is added to a form only when it is required. Whenever data flows across multiple pages or content areas, the overflow leader and trailer subforms are inserted into the form in the appropriate places.</p>
Binding tab in the Object palette	<p>Every Designer object that can be bound to a data source includes a Binding tab in the Object palette. If you bind an object on your form design to a particular data node from your data connection, the Data Binding (Open, Save, Submit) list displays a valid FormCalc reference syntax for accessing that data node. You can use the FormCalc reference syntax in other calculations or scripts for testing purposes.</p>
XML Source tab	<p>The XML Source tab contains the form design's XML code. The XML source code defines all aspects of the form. You can use the XML Source tab to view the XML Form Object Model structure of a form design and to understand the relationships between objects and properties. In the XML source, the XML element names are equivalent to the object names in the XML Form Object Model, and attributes are equivalent to properties.</p> <p>When you select an object in the Hierarchy palette and then click the XML Source tab, the first line of the corresponding element is highlighted. The object name in Designer, as listed in the Hierarchy palette, becomes the value of the <code>name</code> attribute in the XML source.</p> <p>You can set options in the Tools > Options dialog box for viewing the source in the XML Source tab, such as showing or hiding line numbers and setting the syntax coloring.</p> <p>It is recommended that you do not edit the XML source code directly.</p>

You may also find it useful to change the default options for the Script Editor to make it easier to debug your calculations and scripts. These options are in the Workspace panel of the Options dialog box, which is available by selecting Tools > Options and then selecting Workspace from the list on the left. For example, you can choose to display line numbers in the Script Editor or change the formatting of FormCalc or JavaScript syntax.

Chapter 4: Creating Calculations and Scripts

Designer provides a wide range of calculation and scripting features that you can use to perform a variety of tasks. For example, the following script changes the color of a text field border and the font size of the text field value:

```
TextField1.border.edge.color.value = "255,0,0";
TextField1.font.typeface = "Courier New";
```

More complex forms can take advantage of scripting to perform data source connectivity and data manipulation at run time. For examples of common scripting tasks, see “[Examples of Common Scripting Tasks](#)” on page 103.

Creating calculations and scripts in Designer involves following a general process each time you attach a calculation or script to an object. Although not all aspects of the process are required each time you create a calculation or script, following the process helps to eliminate potential errors and unexpected results.

In general, each time you create a calculation or script, you perform the following tasks:

- Select the object to which you want to attach a calculation or script. Although you can create calculations and scripts that manipulate almost any object on your form design, not all form design objects support form events. For a list of standard objects included in the Object Library palette in Designer that support scripting, see “[Objects that support calculations and scripts](#)” on page 4.
- Write your calculation or script in the script editing field of the Script Editor.
- Test the calculation or script either by using the Preview PDF tab or in your test environment.

Naming conventions for form design objects and variables

When creating calculations or scripts to enhance your form, be aware of the form design object and variable names on your form. In general, avoid using the names of XML Form Object Model properties, methods, and objects for form design objects and variables. Using XML Form Object Model property, method, or object names can result in calculations and scripts not executing properly.

For example, if you create a new text field named `x` within a subform object named `Subform1`, you access the text field object using the following syntax:

```
Subform1.x. [expression]
```

However, subform objects already have an XML Form Object Model property named `x` that represents the horizontal position of the subform on the form design.

To avoid naming conflicts, you need to choose field naming conventions that differ from the XML Form Object Model naming conventions. For example, you can use any of the following field names for the text field in the example above:

- `horizontalValue`
- `x_value`
- `xLetter`

- hValue

For more information and a list of the XML Form Object Model property, method, and object names, see [Scripting Reference](#).

More Help topics

[“Naming variables” on page 62](#)

[“Creating Calculations and Scripts” on page 12](#)

Choosing a scripting language

Designer supports scripting with both FormCalc and JavaScript. Each scripting language presents its advantages that you should be aware of before you write any scripts on your form.

FormCalc is a calculation language that includes a wide range of built-in functions to simplify the most common form functionality. For example, you can use FormCalc financial functions to evaluate the size of a loan payment based on the principle amount, interest rate, and number of payment periods.

JavaScript is a more powerful and diverse scripting language, intended to give you more flexibility and leverage your existing scripting knowledge. For example, you can reuse your existing JavaScript functions in Designer to reduce the amount of new scripting you need to create.

Note: *Designer supports JavaScript version 1.6 or earlier.*

You can choose the scripting language that is used for new forms in the Workspace panel in the Options dialog box, and for the current form on the Defaults tab in the Form Properties dialog box.

The scripting language that is displayed in the Language list in the Script Editor matches the scripting language option you select as the default for new forms. However, if you change the scripting language setting for the current form, the scripting language that is displayed in the Language list changes similarly for new scripts on new events. Changing the scripting language option in the Form Properties dialog box does not change the scripting language that was used for existing scripts. If an event already contains some script and that script is deleted, the Script Editor continues to use that scripting language for the duration of your Designer working session.

Note: *Effective March 10, 2012, Adobe is deprecating the Guides capabilities of Adobe® LiveCycle® ES. The Guides functionality is available for upgrade purposes only and will be removed from the product after two major releases.*

The following table highlights some of the key differences between FormCalc and JavaScript.

FormCalc	JavaScript
Native Adobe calculation language valid in Designer and Adobe document services	Standard scripting language used in many popular software applications
Shorter scripts (typically one line only) Supports script looping	Potential for longer scripts, if necessary, with the ability to use looping
Not supported by form guides	Supported by form guides
Contains a variety of useful built-in functions to reduce the amount of scripting required to accomplish common form design tasks	Provides access to the Acrobat Object Model and the JavaScript capabilities of Acrobat

FormCalc	JavaScript
Support for international dates, times, currencies, and number formats	Debugging possible by using the JavaScript debugger in Acrobat
Built-in URL functions for Post, Put, and Get allow web-based interactions	Create custom functions for your own specific needs
Compatible on all Designer and Adobe document services supported platforms	Compatible on all Designer and Adobe document services supported platforms

More Help topics

[“Using FormCalc” on page 53](#)

[“Using JavaScript” on page 56](#)

[“Creating and Reusing JavaScript Functions” on page 76](#)

To create a calculation or script

- 1 Select an object on your form design that supports events. For example, add a button to a new, blank form.
- 2 In the Script Editor, from the Show list, select one of the events that apply to the object. The event you choose specifies when the script will execute. If you are writing a calculation or script that affects an object that does not support events, you must add your calculation or script to a form design object that does support form events. For example, using the new button object, select the click event in the Show list.
- 3 In the Language list, select your scripting language. For example, for the new button object, select JavaScript.
- 4 In the Run At list, select where you want the script to execute. For example, for the new button object, select Client.

You can choose to run calculations or scripts on your client-based application (for example Acrobat or a web browser) or on your server-based process (for example, Adobe document services).

When set to Client, processing of calculations and scripts initiates after the form renders. When set to Server, processing of calculations and scripts initiates during the form rendering process. Previewing your form by using the Preview PDF tab simulates opening the form in Acrobat; therefore, scripts set to run at Client or Client and Server execute.

Note: Selecting Client And Server from the Run At list causes a script to execute in either the client application or the server application, depending on which application is used to process the form.

- 5 In the Script Source field, insert your FormCalc calculation or JavaScript script. You can take advantage of the statement completion functionality of Designer to help you create reference syntaxes for your calculation or script. For example, add the following JavaScript script to the new button object:

```
xfa.host.messageBox("Hello World!", "Creating a new script", 3);
```

- 6 After you complete your form design, test and debug your calculations and scripts before putting them into production. For example, for the new button object, preview the PDF of the form using the Preview PDF tab. Click the button object to display the message box specified in step 5.

For more information about the Designer objects that support scripting, see “[Objects that support calculations and scripts](#)” on page 4.

More Help topics

- [“Using FormCalc” on page 53](#)
- [“Using JavaScript” on page 56](#)
- [“Events” on page 22](#)
- [“To use statement completion to create calculations and scripts” on page 16](#)
- [“Determining when to run your calculation or script” on page 17](#)
- [“To view scripting events and scripts” on page 18](#)
- [“Determining where to run your calculation or script” on page 19](#)
- [“Testing and debugging calculations and scripts” on page 19](#)

To find text or other items

You can quickly search for every occurrence of a specific word or phrase when you are in the XML Source tab or in the Script Editor.

- 1 In the XML Source tab or the Script Editor, select Edit > Find or right-click for the context menu.
- 2 In the Find What box, enter the text that you want to search for.
- 3 Select any other options that you want.
- 4 Click Find Next.

To cancel a search in progress, press Esc or select the Cancel button.

More Help topics

- [“Creating Calculations and Scripts” on page 12](#)
- [“To replace text or other items” on page 15](#)
- [“To use statement completion to create calculations and scripts” on page 16](#)
- [“Determining when to run your calculation or script” on page 17](#)
- [“To view scripting events and scripts” on page 18](#)
- [“Determining where to run your calculation or script” on page 19](#)
- [“Testing and debugging calculations and scripts” on page 19](#)

To replace text or other items

You can automatically replace text. For example, you can replace *Corp.* with *Corporation*.

- 1 In the Script Editor, select Edit > Replace.
- 2 In the Find What box, enter the text that you want to search for.
- 3 In the Replace With box, enter the replacement text.
- 4 Select any other options that you want.

- 5 Click Find Next, Replace, or Replace All.
- 6 To cancel a search in progress, press Esc or select the Cancel button.

To replace text that appears in scripts attached to multiple objects on your form, select the root subform of your form (by default: `form1`) and select Show Events for Child Objects and then perform the procedure above.

More Help topics

[“Creating Calculations and Scripts” on page 12](#)

[“To find text or other items” on page 15](#)

To use statement completion to create calculations and scripts

The statement completion functionality within the Script Editor lets you build your calculations and scripts interactively.

When writing a calculation or script, each time you enter a period (.) immediately following a form object or property name, the statement completion functionality displays a list of available methods and properties. If the statement completion list does not appear, verify that you have typed the object or property name correctly and that the object is within the scope of the object where you are creating your script. For more information about referencing objects in calculations and scripts, see “[Referencing Objects in Calculations and Scripts](#)” on page 65.

- 1 Type the name of a form design object, property, or a valid FormCalc shortcut, followed by a period.
- 2 Select the method or property you want to apply for the form design object and continue writing the script. To close the statement completion list without selecting a function, press the Esc key.

The list of available XML Form Object Model properties changes depending on the form design object or property that appears before the period.

Note: The statement completion list appears only when accessing objects, properties, and methods in the XML Form Object Model. It does not appear when working with standard JavaScript objects or methods.

More Help topics

[“Referencing object properties and values” on page 65](#)

To insert object reference syntax automatically

As an alternative to using the statement completion list to create object reference syntax, you can use the insert object reference syntax feature to automatically add reference syntax to your calculation or script. This feature inputs an abbreviated reference syntax for the object you select from the canvas into the Script Source field of the Script Editor. This reduces the time required to create calculations and scripts and ensures that the reference syntax is accurate.

- 1 Ensure that the Script Source field of the Script Editor has the focus and the cursor is positioned where you want to insert the object reference.
- 2 On your form, Ctrl+click the object you want to reference. The cursor changes to to assist you when selecting an object.

More Help topics

[“Referencing Objects in Calculations and Scripts” on page 65](#)

Determining when to run your calculation or script

When creating calculations and scripts, you must associate each entry with a specific form event. Each form event represents a change in the form’s state that initiates at a specific time.

The change in form state can occur during form rendering on the server by Adobe document services, or on the client by Acrobat or Adobe Reader during form filling by an end user.

When a change in the state of the form occurs, any calculations or scripts associated with the event are processed automatically.

The event you use when creating a calculation or script will, to some extent, determine what you must include in your calculation or script. For example, the amount and type of information available on a form may be different depending on the event timing you choose; therefore, a calculation or script that retrieves a value from a field may have different results if run before instead of after a form filler performs certain actions. For more information about events, see [“Events” on page 22](#).

Depending on the type of form you are creating, some events may never occur. For example, if you are creating a form that has a fixed layout and no interactive objects, then interactive events associated with form filler actions may never occur and, as a result, any scripts associated with those events will not run.

Although Designer includes support for a wide variety of form events, it is possible to accomplish a wide variety of common calculation and scripting tasks by using only a few events that occur at major changes in a form’s state, such as the following events:

docReady Initiates immediately after the form opens in Acrobat or Adobe Reader and immediately before the form filler can begin interacting with form objects. This event is the last event to occur before control of the form is given to the form filler.

enter Initiates when the form filler changes the focus to a particular field, button, or subform.

exit Initiates when the form filler changes the focus from a particular field, button, or subform, to another object.

change Initiates when a form filler makes a change to a field value. This event is most commonly used with drop-down lists or list boxes to execute a script when a form filler makes a change to the current value.

click Initiates when a form filler clicks a field or button. This event is most commonly used with buttons to execute a script when a form filler clicks the button.

More Help topics

[“To view scripting events and scripts” on page 18](#)

[“Events” on page 22](#)

[“Determining where to run your calculation or script” on page 19](#)

To view scripting events and scripts

The Script Editor, provides several ways to view scripting events for objects in your form, depending on the type of object or objects you select, and the quantity of events you want to display.

Before you begin, you must perform the following actions:

- If the Script Editor is not displayed on the screen, select Palettes > Script Editor.
- If the Script Editor is not large enough to display more than one line of script at a time, drag its lower line down to increase its size.

To view a scripting event for a single object in the Script Editor

- 1 Select an object in your form.
- 2 In the Show list, select a valid scripting event.

To view a scripting event for a container object and its children in the Script Editor

- 1 If it is not already in multiline mode, expand the Script Editor to display multiple lines of script and ensure that the Show Events for Child Objects option is selected.
- 2 Select a container object, such as a subform.
- 3 In the Show list, select a valid scripting event.

The events appear in the script editing field of the Script Editor, separated by the reference syntax for each event. Note that certain events only apply to specific types of objects. When you select a script event, the script editing field of the Script Editor only displays valid instances of the event. For example, if you select a subform that contains a drop-down list and select the `preOpen` event, the Script editor displays a single entry representing the drop-down list. This is because the `preOpen` event only applies to drop-down lists. Alternatively, selecting the `enter` event displays two entries, one for the drop-down list and one for the subform.

Note: The Show list denotes events that contain scripts using a trailing asterisk () after the name of the event. If an event contains a script, when you select the event from the Show list, the source appears in the script editing field of the Script Editor.*

To view all scripting events for a single object in the Script Editor

- 1 Select an object in your form.
- 2 In the Show list, select All Events.

The events appear in the script editing field of the Script Editor, separated by the reference syntax for each event.

To view all scripting events for a container object and its children in the Script Editor

- 1 If it is not already in multiline mode, expand the Script Editor to display multiple lines of script and ensure the Show Events for Child Objects option is selected.
- 2 Select a container object, such as a subform.
- 3 In the Show list, select All Events.

The events appear in the script editing field of the Script Editor, separated by the reference syntax for each event.

To view all scripts for a single object in the Script Editor

- 1 Select an object that has scripts attached.
- 2 In the Show list, select Events With Scripts.

The scripts appear in the script editing field of the Script Editor, separated by the reference syntax for each event.

To view all scripts for a container object and its children in the Script Editor

- 1 If it is not already in multiline mode, expand the Script Editor to display multiple lines of script and ensure that the Show Events for Child Objects option is selected.
- 2 Select a container object, such as a subform. All events for the container object and any child objects appear in the Script Editor.
- 3 In the Show list, select All Events.

The scripts appear in the script editing field of the Script Editor, separated by the reference syntax for each event.

Determining where to run your calculation or script

For each calculation and script created in Designer, you must specify the location where you want the calculation or script to run.

Unless you are using server-based processing such as Adobe document services, you should ensure that all of your calculations and scripts are set to run on the client application (for example, on Acrobat or a web browser).

If you are using server-based processing, you can choose between running calculations on the client application, or running them on the server. By choosing to have calculations and scripts run on the server, you are choosing to run the scripts at a specific point during the form-rendering process.

For more information, see [Creating scripts for use with Adobe document services](#).

If you choose Client And Server from the Run At list, your calculation or script is available to both client and server-based applications. This option is useful, for example, if you do not know whether your users will have client or server applications when they attempt to use your form. It is also useful if you want certain form objects to behave one way to a client application and another to a server-based application.

More Help topics

[“Events” on page 22](#)

[“Determining when to run your calculation or script” on page 17](#)

[“To view scripting events and scripts” on page 18](#)

Testing and debugging calculations and scripts

After you create your calculations or scripts and tested your form design, you may discover scripting errors or unexpected field values as a result of scripting syntax errors.

Designer includes three primary methods for testing and debugging your calculations and scripts:

- Using the Designer workspace palettes. For more information, see [“Using the workspace to debug calculations and scripts” on page 10](#).
- For JavaScript only, using the JavaScript Debugger to assist you in testing your scripts. For more information about using the debugger, see [“JavaScript Debugging” on page 81](#).
- Using the host model and event model properties and methods to troubleshoot your form.

The host model and event model provide functionality that lets you interact with either the host application or the various form events. These models are useful for returning information that can assist you in debugging calculation and scripts.

For example, the following script returns a message at run time indicating the name of the event on which the script is placed. This indicates that a particular event has fired:

```
xfa.host.messageBox(xfa.event.name) // FormCalc  
xfa.host.messageBox(xfa.event.name); // JavaScript
```

Another example of using the host model and event model methods is to obtain the value of a field on an interactive form before a user manually changed it. This is useful for observing how the objects on your form design respond to user-entered data:

```
xfa.host.messageBox(xfa.event.prevText) // FormCalc  
xfa.host.messageBox(xfa.event.prevText); // JavaScript
```

More Help topics

[“Using the workspace to debug calculations and scripts” on page 10](#)

[“Working with a Host Application” on page 86](#)

[“Working with the Event Model” on page 89](#)

To check script syntax

While you work on a form design, you can check all JavaScript or FormCalc scripts for syntax errors to ensure that the form functions as expected before you distribute it for use. Any script syntax errors found in the form are displayed in the Report palette on the Warnings tab. On the Warnings tab in the Report palette, each error is listed on a separate numbered line, along with the event or script object name and a description of the error. If multiple events are displayed, the line numbering for each event begins at 1.

You can click any script error in the list to display the relevant script, highlight the line that contains the error, and locate the insertion point at the beginning of the highlighted line. Scripting syntax errors are also reported in the Warnings tab when you save a form design or preview it using the Preview PDF tab.

Note: You can also use the Go To Line dialog box to select the event you want to see. The script event drop-down list includes the System Object Model (SOM) expression, as shown in the header lines, for each event currently visible in the Script Editor.

- ❖ In the Script Editor, select Tools > Check Script Syntax.

More Help topics

[“Using FormCalc” on page 53](#)

[“Using JavaScript” on page 56](#)

[“Objects that support calculations and scripts” on page 4](#)

Working around security restrictions

Script that modifies the sourceSet model or its children makes the form's certification invalid and the form can no longer be trusted. Because a form can become certified at any time during its life cycle, it is important to use scripting techniques that prevent the form from failing after it is certified.

You must work with clones of the model rather than with the model if you intend to use scripts that modify the sourceSet model or any of its children. Cloning prevents the form from failing when scripts modify a data model. For example, forms that execute common tasks, such as displaying records in a database or selecting specific records in a database, require the modification of data connection nodes contained within the sourceSet model.

To clone the sourceSet model, you must create a method on the script that defines the data connection that you want to modify within the sourceSet model and make sure that the script keeps using the clone instead of the definition.

Consider the following script from a data drop-down list. The script populates the list from data from a data source.

```
...
var oDB = xfa.sourceSet.nodes.item(nIndex);
...
// Search node with the class name "command"
var nDBIndex = 0;
while(oDB.nodes.item(nDBIndex).className != "command")
nDBIndex++;

oDB.nodes.item(nDBIndex).query.recordSet.setAttribute("stayBOF", "bofAction");
oDB.nodes.item(nDBIndex).query.recordSet.setAttribute("stayEOF", "eofAction");
```

To clone the sourceSet model, you need to change the line that accesses it by appending the clone (1) method to the end of the statement:

```
var oDB = xfa.sourceSet.nodes.item(nIndex).clone(1);
```

Note: You can store the cloned data connection node in a variable or a variable defined in a script object.

Chapter 5: Events

Every calculation or script you attach to a form object is associated with a specific event. An *event* is defined as a particular occurrence or action that can change the state of a form and, when the change of state occurs, automatically invoke a calculation or script associated with the event. Events occur at various times, from the beginning of the form rendering process when merging data with a form design, all the way through to a form filler interacting with objects on a form in a client application. By applying calculations and scripts to specific events, you can control every aspect of how you present form objects, as well as form data, and how the objects and data respond to form filler interaction.

A single change of state or form filler action may trigger multiple events. For example, tabbing from the current field to the next field triggers both the `exit` event for the current field and the `enter` event for the next field. If the current and next fields are in different subforms, a total of four events are triggered; namely, `exit` events for the current field and subform, and `enter` events for the next field and subform. In general, each of the different categories of form events follow a predictable ordering.

Types of events

Form events fall into one of the following categories:

Process events This type of event initiates automatically as the result of an internal process or action related to objects on a form. For example, if a form filler clicks a button that adds a new page to the form, the `initialize`, `calculate`, `validate`, and `layout : ready` process events initiate automatically for the new page.

Interactive events This type of event initiates as a direct result of form filler actions. For example, if a form filler moves the pointer over a field on a form, the `mouseEnter` event initiates in response to the action.

Application events This type of event initiates as a result of the actions that either a client application or a server application performs. For example, you can create a calculation or script to perform a task immediately after the form is saved by using the `postPrint` event.

More Help topics

[“Process events” on page 22](#)

[“Interactive events” on page 24](#)

[“Application events” on page 27](#)

Process events

Process events initiate automatically as the result of an internal process or action related to a form or objects on a form. These events initiate immediately following significant form changes; for example, after a form design is merged with data or after the form pagination process finishes. Process events also initiate immediately after interactive events initiate. For example, immediately after any interactive event initiates, the `calculate` event initiates followed by the `validate` event.

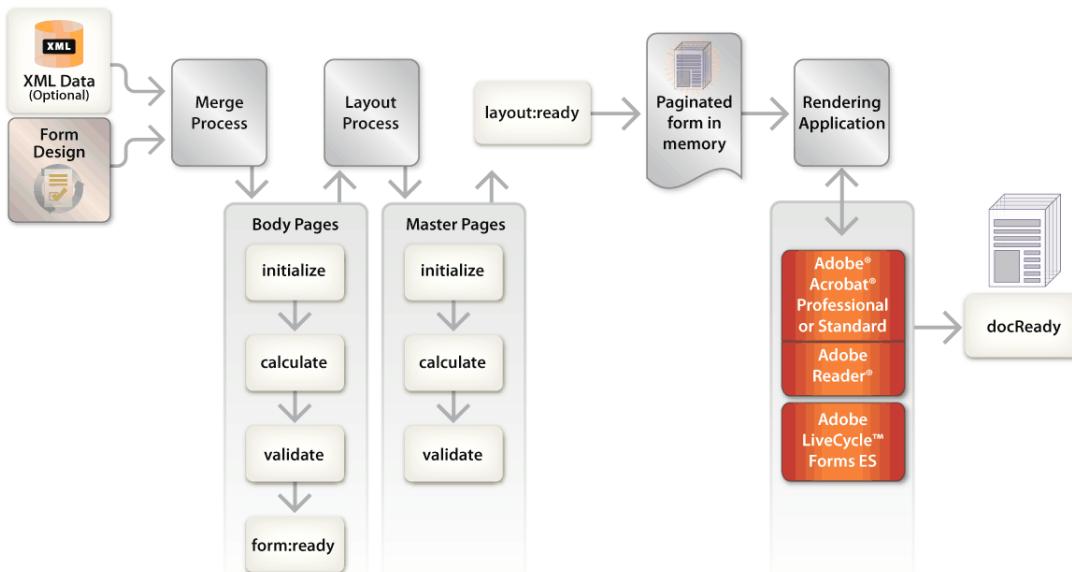
The following list contains the process events, which are available from the Show list in the Script Editor:

- `calculate`

- form:ready
- indexChange
- initialize
- layout:ready
- validate

Process events can initiate many times as a result of dependencies; that is, actions associated with a single event that ultimately initiates one or more additional events. Using an example of a form filler clicking a button to reveal a previously hidden portion of the form, after the form filler clicks the button, not only does a series of interactive and processing events initiate for the button itself, but a number of process events for the new subform initiates as well.

The following image represents the general flow of events leading up to a PDF form opening in Acrobat or Adobe Reader.



After the form opens in Acrobat or Adobe Reader, these process events may still initiate as the result of changes made to the form. For example, the calculate, validate, and layout:ready events for an object initiate immediately after some interactive events occur; therefore, calculations and scripts attached to the processing events will run multiple times.

More Help topics

- “Interactive events” on page 24
- “Application events” on page 27
- “calculate event” on page 29
- “docReady event” on page 32
- “form:ready event” on page 34
- “indexChange event” on page 36
- “initialize event” on page 36

- “[layout:ready event](#)” on page 37
- “[validate event](#)” on page 47
- “[Determining when to run your calculation or script](#)” on page 17

Interactive events

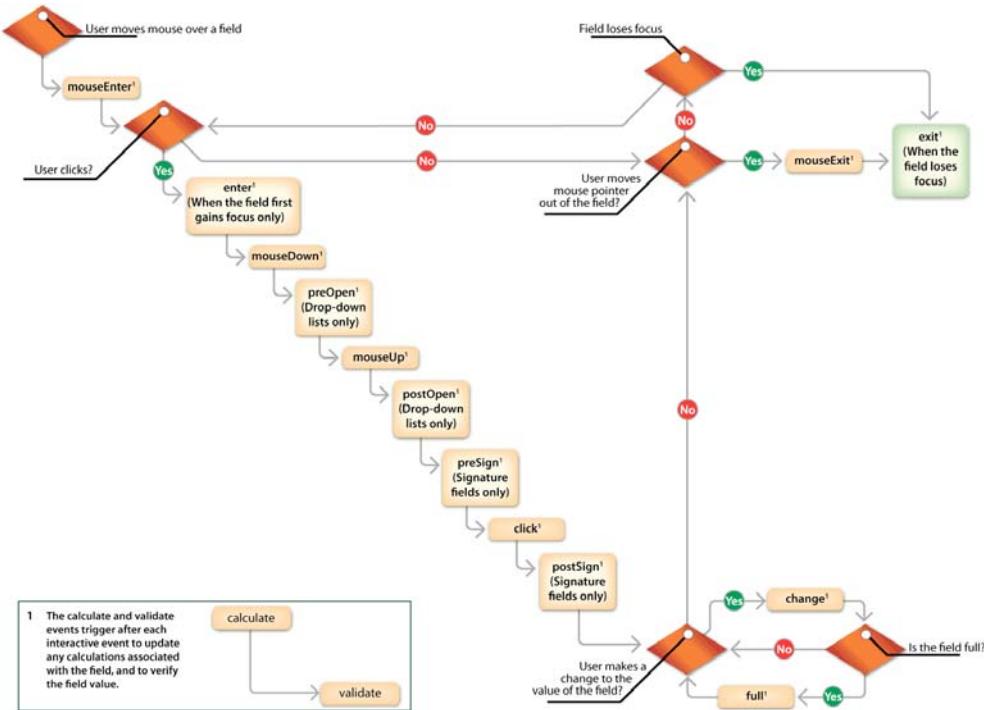
Interactive events initiate as a direct result of form filler actions, which makes these events useful for a variety of calculation and scripting tasks. For example, you can add a script to the `mouseEnter` event for a text field that changes the border color of the field to blue and a script to the `mouseExit` event that changes the border color back to the original color. This action creates a highlighting effect when form fillers move the pointer over the field to visually assist them while filling the form. Interactive events are also useful for changing form data in response to a form filler selection. For example, you can add a script to the `change` event for a drop-down list that updates the data values in multiple fields in response to the value the form filler selects in the drop-down list.

The following list contains the interactive events, which are available from the Show list in the Script Editor:

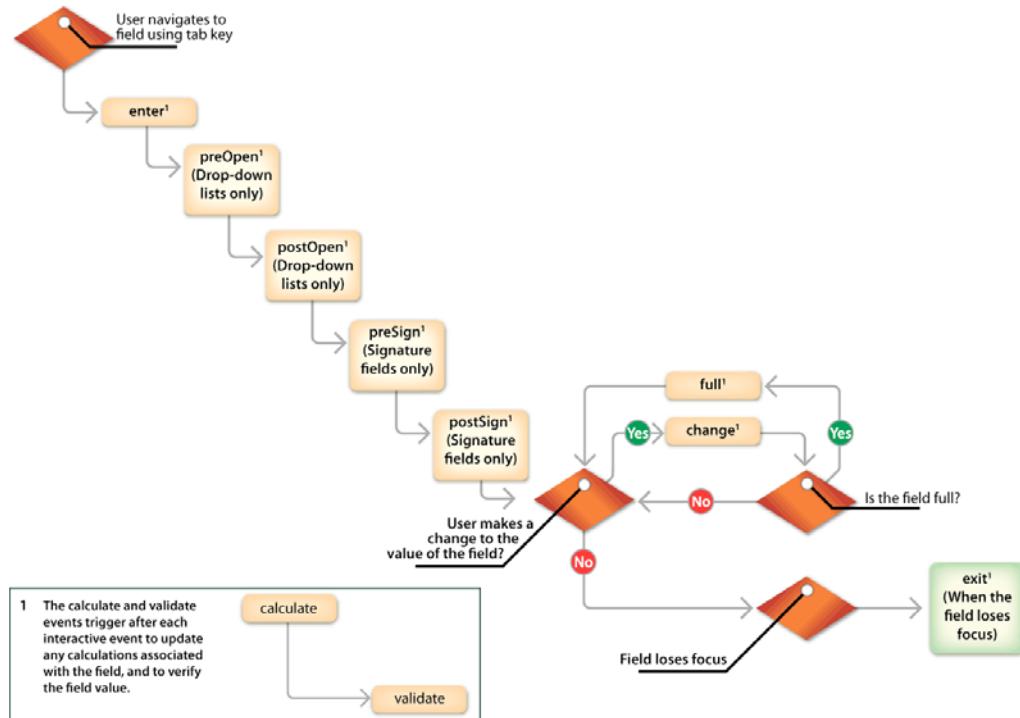
- `change`
- `click`
- `enter`
- `exit`
- `mouseDown`
- `mouseEnter`
- `mouseExit`
- `mouseUp`
- `postOpen`
- `postSign`
- `preOpen`
- `preSign`

The following image displays the general flow of events for form fillers who use the mouse to select an object and change its value.

Note: This image provides a general flow of events; however, certain form filler actions and form objects can cause alternate event ordering. For example, if a form filler selects a value from a drop-down list, the `mouseExit` event occurs after the `click` event but before the `change` or `full` events. Similarly, if a form filler selects a field, holds down the mouse button, and then exits the field while still holding down the mouse button, the `mouseUp` event occurs out of the order described in this image.



The following image displays the general flow of events for form fillers who use the keyboard to select an object and change its value.



More Help topics

- “[change event](#)” on page 30
- “[click event](#)” on page 31
- “[enter event](#)” on page 33
- “[exit event](#)” on page 34
- “[full event](#)” on page 35
- “[mouseDown event](#)” on page 38
- “[mouseEnter event](#)” on page 39
- “[mouseExit event](#)” on page 39
- “[mouseUp event](#)” on page 40
- “[postOpen event](#)” on page 41
- “[postSign event](#)” on page 43
- “[preOpen event](#)” on page 44
- “[preSign event](#)” on page 46

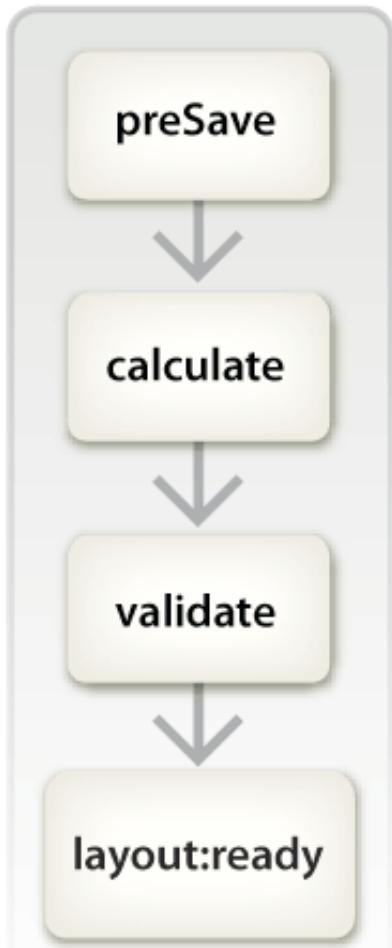
Application events

Application events initiate as a result of the actions that a client application or a server application perform, either due to a form filler action or an automated process. Application events do not exist as part of a general flow of events. They are single events that correspond to actions that the client or server application performs.

The following list contains the processing events, which are available from the Show list in the Script Editor:

- docClose
- docReady
- postPrint
- postSave
- postSubmit
- prePrint
- preSave
- preSubmit

For example, the following image displays the general flow of events for the `preSave` event.



If a form filler saves the form in Acrobat or Adobe Reader, the `preSave` event initiates immediately before the save operation, followed by the `calculate`, `validate`, and `layout : ready` events, in that sequence for all objects on the form. The same event sequence initiates if the form contains a script that programmatically saves the form.

A similar sequence of events occurs for each of the other application events previously listed.

More Help topics

- “[docClose event](#)” on page 32
- “[postPrint event](#)” on page 41
- “[postSave event](#)” on page 42
- “[postSubmit event](#)” on page 43
- “[prePrint event](#)” on page 45

[“preSave event” on page 45](#)

[“preSubmit event” on page 47](#)

calculate event

Description

Initiates in the following situations:

- When your form design and data merge into your finished form.
- When a change occurs to any value that the calculation is dependent on, such as the value of a particular field, unless the form filler has manually overridden the calculated value. As a result, the object will display the return value of the event. The properties for manually overridden fields are located in the Value tab of the Object palette.
- When a field loses focus; for example, when a form filler clicks or uses the Tab key to exit a field.

When using the `calculate` event to perform calculations or scripts, consider the following potential issues:

- Calculations and scripts on the `calculate` event must not make any changes to the structure of the form, except for the form field and data values.
- Content inserted by the `calculate` event must conform to the associated validations for the object; otherwise, validation errors will occur.
- Calculations and scripts must not include an infinite loop because it causes the form to update the value continuously. For example, a script that increments the value of a field as part of a looping expression, such as a `while` or `for` loop, could create an infinite loop.
- The last expression evaluated in the `calculate` event is used to populate the value of the current form object. For example, if the script on the `calculate` event first sets the value of the current field to 500 and then sets the value of another field to 1000, both fields will display the value 1000 at run time. As a result, you need to limit the scripting that you add to the `calculate` event to those that deal specifically with setting the value of the current field.

Type

Processing event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

Use the `calculate` event for updating numeric values in fields because this event initiates immediately after most other events. For example, on a purchase order form, you can use the `calculate` event for a field to determine the percentage of sales tax due based on the cost of the order. The calculation will initiate every time a change is made to the values in the form fields, ensuring that the value displayed for the sales tax is always correct.

However, because the `calculate` event can initiate many times, you must ensure that the calculation or script you add to the event will not cause data values to increment unnecessarily. For example, if your sales tax calculation adds the value of the sales tax to the total cost each time the `calculate` event initiates, the resulting total cost value on your form may be too large.

For a detailed example of using the `calculate` event, see “[Calculating the field sums](#)” on page 118.

More Help topics

[“Events” on page 22](#)

[“Process events” on page 22](#)

change event

Description

Initiates when a form filler changes the content of a field by performing one of these actions:

- Types a keystroke providing the field has keyboard focus
- Pastes data into the field
- Makes a selection from a list box or drop-down list
- Selects or deselects a check box
- Changes the setting of a group of radio buttons

This event does not initiate in response to changes in the object values as a result of calculations or scripts, or by the merging of the form design with data.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes (Only for drop-down lists)

Version

XFA 2.1

Example

Use this event for any calculations or scripts that must initiate in response to a form filler changing the value of a field. For example, you can use the `change` event for a drop-down list to highlight specific rows in a table. Using this technique, each time the form filler selects a value in the drop-down list, the corresponding row of the table appears highlighted.

Note: Scripting against an object’s `this.rawValue` does not work. Use the event model property `$event.fullText` instead to get the object’s current value.

For a detailed example of using the `change` event, see “[Getting the current or previous value of a drop-down list](#)” on page 114.

More Help topics

“[Events](#)” on page 22

“[Interactive events](#)” on page 24

click event

Description

Initiates when a mouse click occurs within the region. When a `click` event initiates for a text or numeric field, calculations or scripts execute immediately. However, the value of the field does not change in response to calculations and scripts until the field loses focus.

Note: You cannot place a calculation or script on the `click` event of a submit button because the calculation or script will override the submission action. Instead, place any calculations and scripts on the `preSubmit` event for a submit button. For more information about form submission actions, see the Designer Help.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

Use this event for performing an action as a direct response to a form filler clicking a button or selecting a radio button or check box on a form. For example, you can use the `click` event for a check box to hide and show a field on the form.

For a detailed example of using the `click` event, see “[Changing the visual properties of an object on the client](#)” on page 111.

More Help topics

“[Events](#)” on page 22

“[Interactive events](#)” on page 24

“[preSubmit event](#)” on page 47

docClose event

Description

Initiates at the very end of processing a form, only if all form validations complete with no errors.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

This event initiates too late to modify a saved form and is intended to provide the ability to generate an exit status or completion message. For example, you can use the `docClose` event to display a message to a form filler indicating that the form is completed.

More Help topics

[“Events” on page 22](#)

[“Application events” on page 27](#)

[“Process events” on page 22](#)

docReady event

Description

Initiates immediately after the form opens in Acrobat or Adobe Reader.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

This event is the first one that initiates after the form opens in Acrobat or Adobe Reader. Any calculation or scripting tasks that require the full form, or that should only run once when the form filler first opens the form, should use this event. For example, you can use the `docReady` event to check the version of Acrobat or Adobe Reader and return a message to the form filler if the form filler must upgrade the application before filling the form.

More Help topics

[“Events” on page 22](#)

[“Application events” on page 27](#)

enter event

Description

Initiates when a field or subform gains keyboard focus, whether caused by a form filler action (tabbing into a field or clicking in it) or by a script programmatically setting the focus.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to provide help text or other messages to a form filler while entering the current field or subform. For example, if a field requires a value in a specific format, or if filling a field requires special instructions, you can use this event to provide a message to the form filler indicating the special needs.

For a detailed example of using the `enter` event, see “[Highlighting fields in response to form filler interaction](#)” on page 119.

More Help topics

[“Events” on page 22](#)

[“Interactive events” on page 24](#)

exit event

Description

Initiates when the field or subform loses keyboard focus, whether caused by a form filler action (tabbing to another field or clicking outside it) or by a script programmatically removing the focus.

Note: If the purpose of your script is to manipulate the value of the current field, you need to consider attaching your script to the calculate event.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to provide verification of field data as a form filler moves the focus away from a field. For example, if a field requires a value, you can use this event to provide a message to the form filler indicating that the field requires some data before the form can be submitted.

For a detailed example of using the `exit` event, see “[Highlighting fields in response to form filler interaction](#)” on page 119.

More Help topics

“[Events](#)” on page 22

“[Interactive events](#)” on page 24

form:ready event

Description

Initiates after the form design and data are merged, the finished form exists in memory, and the `initialize`, `calculate`, and `validate` events are complete.

Note: The `form:ready` event only applies to Design View objects, and does not apply to Master Page objects (see “[Process events](#)” on page 22).

Type

Processing event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

You can use this event to perform tasks after the form design and data are merged but before the layout is established. For example, you can use this event to customize the ordering or placement of subforms on your form before the form is paginated and rendered.

More Help topics

[“Events” on page 22](#)

full event

Description

Initiates when the form filler attempts to enter more than the maximum allowed amount of content into a field. For example, if the Limit Length property for a field is set to 5, and a form filler attempts to enter the string abcdef, the full event initiates when the form filler types the letter f.

Note: The Limit Length property for a field is located in the Field tab in the Object palette.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

Use this event to indicate to a form filler that a field has reached its maximum capacity. For example, you can output a message to the form filler indicating that the field is full and provide any steps that should be taken to correct the issue.

More Help topics[“Events” on page 22](#)[“Interactive events” on page 24](#)

indexChange event

Description

Initiates as a result of a subform being inserted, moved, or removed from the form by merging new data with the form or by using scripting.

Keep in mind that the indexChange event does not fire when deleting the last row of a table.

Note: *This event is received only by the subform instances that are controlled by the instance manager; the event is ignored for subform sets.*

Type

Processing event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.5

Example

You can use this event to set properties based on the instance value of a particular object. For example, you can use this event to coordinate the shading of alternate rows in a table.

More Help topics[“Events” on page 22](#)[“Process events” on page 22](#)

initialize event

Description

Initiates for all objects after the form design is merged with data.

Type

Processing event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to perform actions when an object is first created, either as the result of a form filler action or during the form creation process. For example, you can use this event to control settings for new instances of a subform object that a form filler adds to the form by using a button.

More Help topics

[“Events” on page 22](#)

[“Process events” on page 22](#)

layout:ready event

Description

Initiates after the form design and data are merged, the form exists, and the form's layout is applied. At this time, the finished form has not been rendered; therefore, a calculation or script set to run on this event could modify the layout before the form is rendered. This event also occurs after the form is rendered if a calculation or script changes the data or causes a change to the form in Acrobat or Adobe Reader.

Note: *Scripts that fire on layout:ready should not do anything that would cause the layout of the form to change. For example, this would include anything involving subforms or tables that grow or shrink, adding fragments dynamically at run time, adding or removing subform instances, and toggling the presence setting of an object between hidden and visible.*

Fields in interactive forms that contain the layout:ready event are supported in Acrobat 7.0.5 and later.

Type

Processing event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

You can use this event to perform tasks immediately after the form layout is established. For example, you can use this event to determine the number of pages the form contains.

More Help topics

[“Events” on page 22](#)

[“Process events” on page 22](#)

mouseDown event

Description

Initiates when a form filler presses the mouse button at the same time that the pointer is within a field.

Note: When a `mouseDown` event initiates for a text or numeric field, calculations or scripts run immediately. However, the value of the field does not change in response to calculations and scripts until the field loses focus. When a `mouseDown` event initiates for a signature field, the event initiates before the signature process begins.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to perform an action as a direct response to a form filler clicking a button, or selecting a radio button or check box on a form. For example, you can use the `mouseDown` event for a check box to hide and show a field on the form. This event is conceptually similar to the `click` event and has a similar purpose.

More Help topics

[“Events” on page 22](#)

[“Interactive events” on page 24](#)

[“click event” on page 31](#)

mouseEnter event

Description

Initiates when the form filler moves the pointer into the area of the field, without necessarily pressing the mouse button. This event is not initiated when the pointer moves into the field for a different reason; for example, because an overlapping window closes.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

You can use this event to provide visual feedback to a form filler in conjunction with the `mouseExit` event. For example, you can use this event to change the border or background color of an object to help visually indicate to form fillers that they are working in a specific field.

For a detailed example of using the `mouseEnter` event, see “[Highlighting fields in response to form filler interaction](#)” on page 119.

More Help topics

“[Events](#)” on page 22

“[Interactive events](#)” on page 24

mouseExit event

Description

Initiates when a form filler moves the pointer out of the field, even if the form filler is pressing the mouse button. It is not initiated when the pointer moves out of the field for a different reason; for example, because an overlapping window opens.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

You can use this event to provide visual feedback to a form filler in conjunction with the `mouseEnter` event. For example, you can use this event to return the border or background color of an object to its original value to help visually indicate to form fillers that they are no longer working in a specific field.

For a detailed example of using the `mouseExit` event, see “[Highlighting fields in response to form filler interaction](#)” on page 119.

More Help topics

“[Events](#)” on page 22

“[Interactive events](#)” on page 24

mouseUp event

Description

Initiates when a form filler releases the mouse button at the same time that the pointer is within a field.

Note: When a `mouseUp` event occurs for a text or numeric field, calculations or scripts run immediately. However, the value of the field does not change in response to calculations and scripts until the field loses focus.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to perform actions as a direct response to a form filler clicking a button, or selecting a radio button or check box on a form. For example, you can use the `mouseUp` event for a check box to hide and show a field on the form. This event is conceptually similar to the `click` event and has a similar purpose.

More Help topics[“Events” on page 22](#)[“Interactive events” on page 24](#)

postOpen event

Description

Initiates immediately after a form filler performs an action that causes the data in a drop-down list to appear, such as clicking the arrow icon on the drop-down list or tabbing into the drop-down list and then using the down arrow. This event initiates after the contents of the drop-down list are displayed.

Note: This event applies only to the Drop-down List object.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.8

Example

You can use this event to handle errors or unexpected outcomes as a result of processing the opening of the drop-down list. For example, if the `preOpen` event is dispatched via scripting instead of user interaction, or if the opening of the drop-down list data does not occur as a result of an error, the `postOpen` event is still dispatched to let error handling scripts execute.

More Help topics[“Events” on page 22](#)[“Interactive events” on page 24](#)

postPrint event

Description

Initiates immediately after the rendered form is sent to the printer, spooler, or output destination.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

You can use this event to display information messages to the form filler after the form is printed. For example, you can create a script on the `postPrint` event to remind form fillers what steps they need to take to submit the form by hand.

More Help topics

[“Events” on page 22](#)

[“Application events” on page 27](#)

postSave event

Description

Initiates immediately after a form filler saves a form in PDF or XDP format. This event does not initiate when you export a subset of the form (for example, only form data) to XDP.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.1

Example

You can use this event to display information messages to the form filler after the form data is saved. For example, you can create a script on the `postSave` event to remind form fillers how much time remains for them to successfully complete and submit the form.

More Help topics

[“Events” on page 22](#)

[“Application events” on page 27](#)

postSign event

Description

Initiates immediately after a form filler performs an action that applies a digital signature to a form.

Note: This event applies only to the Signature Field object.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.8

Example

You can use this event to inform a user about any restrictions that are imposed now that the form is digitally signed.

More Help topics

[“Events” on page 22](#)

[“Interactive events” on page 24](#)

postSubmit event

Description

Initiates immediately after a form submits data to the host through the HTTP protocol.

Note: This event does not distinguish between submissions that are initiated by instances of clicking buttons, or submissions made to different URLs. Any script that needs to make these distinctions must include a script to determine which button was clicked. In general, the postSubmit event is conceptually similar to the postSave event and serves a similar purpose.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes (Only for submit buttons)

Version

XFA 2.8

Example

You can use this event to perform actions immediately after the form data is submitted. For example, you can create a script on the `postSubmit` event to display confirmation that the submission performed successfully.

More Help topics[“Events” on page 22](#)[“Application events” on page 27](#)

preOpen event

Description

Initiates when a form filler performs an action that causes the drop-down list to appear, such as clicking the arrow icon on the drop-down list or by tabbing into the drop-down list and using the down arrow. This event initiates before the contents of the drop-down list are displayed.

Note: This event applies only to the Drop-down List object.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.4

Example

You can use this event to control the loading of large numbers of list items. For example, you can use this event to load a fixed number of records from a data source into a drop-down list. This improves the performance of the form for the form filler at run time.

More Help topics[“Events” on page 22](#)[“Interactive events” on page 24](#)

prePrint event

Description

Initiates immediately before the process of rendering a form for printing begins. You cannot cancel printing using this event.

Important: Avoid using this event to hide or show form objects. For example, if a form filler has already digitally signed the form, using this event to hide all button objects prior to printing will impact the state of the signature.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to change the presence of an object to prevent it from printing. For example, you can use this event to hide text or instructions intended for the form filler to use while filling the form online.

More Help topics

[“Events” on page 22](#)

[“Application events” on page 27](#)

preSave event

Description

Initiates immediately before form data is saved in PDF or XDP format. This event does not initiate when the form data or another subset of the form is exported to XDP.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to change form data immediately before the data is saved. For example, you can create a script on the `preSave` event to scan the data and display a reminder message to the form filler if certain required fields remain empty.

More Help topics[“Events” on page 22](#)[“Application events” on page 27](#)

preSign event

Description

Initiates immediately before a form filler performs an action that applies a digital signature to a form.

Note: This event applies only to the Signature Field object.

Type

Interactive event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	no

Version

XFA 2.8

Example

You can use this event to validate the data that the digital signature covers or to provide any information to a user before they apply the digital signature.

More Help topics[“Events” on page 22](#)[“Interactive events” on page 24](#)

preSubmit event

Description

Initiates when a form submits data to the host through the HTTP protocol. At this point, the data is organized into a data set but has not been sent to the host. Calculations and scripts associated with this event can examine and alter the data prior to the form submission. If the calculation or script is set to run on the server, the form sends the data to the server indicating that it should run the calculation or script before performing any additional processing.

Note: This event does not distinguish between submissions initiated by instances of clicking buttons or to different URLs. Any script that needs to make these distinctions must include code to determine which button was clicked. In general, the preSubmit event is conceptually similar to the preSave event and serves a similar purpose.

Type

Application event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes (Only for submit buttons)

Version

XFA 2.1

Example

You can use this event to change form data immediately before the data is submitted. For example, you can create a script on the preSubmit event to scan the amount of data and display a message to the form filler estimating how long the data submission may take.

More Help topics

[“Events” on page 22](#)

[“Application events” on page 27](#)

[“preSave event” on page 45](#)

validate event

Description

Initiates when the form design and data merge to create your form and when a field loses focus; for example, when a form filler clicks or uses the Tab key to exit a field. This event initiates again each time the value of a field changes. Calculations and scripts placed on the validate event provide a method to perform validations that are more specific than those available through the Value tab of the Object palette.

Events

Calculations and scripts on the validate event are required to return true or false (expressed in a format appropriate to the scripting language) corresponding to a validation that succeeds or fails, and must not affect the overall form structure of form values. In addition, calculations and scripts should not attempt to provide feedback to a form filler because that form filler may not be using the form in a client application such as Acrobat.

Note: Because validations are performed against the content of the form, they cannot be used to verify presentation formatting caused by field patterns.

Type

Processing event

Support

Client application	Availability
Acrobat and Adobe Reader	yes
HTML browser	yes

Version

XFA 2.1

Example

You can use this event to verify object values, particularly in situations where object data must conform to specific rules. For example, you can create a script on the validate event to verify that a total cost field on a purchase order form does not have a negative value.

For a detailed example of using the validate event, see “[Setting a field as required at run time](#)” on page 117.

More Help topics

“[Events](#)” on page 22

“[Process events](#)” on page 22

Chapter 6: Scripting with FormCalc and JavaScript

Although FormCalc and JavaScript are intended for two different types of users, there is some overlap between the types of built-in functions they offer. The following table lists all available FormCalc functions and whether a comparable function exists within JavaScript.

For more information about FormCalc functions and their parameters, see “[Built-in function syntax](#)” on page 53.

FormCalc function	Description	JavaScript method equivalent
Abs(n1)	Returns the absolute value of a numeric value or expression.	Math.abs(n1)
Apr(n1, n2, n3)	Returns the annual percentage rate for a loan.	None
At(s1, s2)	Locates the starting character position of a string within another string.	String.search(s1)
Avg(n1 [, n2...])	Evaluates a set of number values and/or expressions and returns the average of the non-null elements contained within that set.	None
Ceil(n1)	Returns the whole number greater than or equal to a given number.	Math.ceil(n1)
Choose(n1, s1 [, s2...])	Selects a value from a given set of parameters.	None
Concat(s1 [, s2...])	Returns the concatenation of two or more strings.	String.concat(s1, s2 [, s3 ...])
Count(n1 [, n2...])	Evaluates a set of values and/or expressions and returns the number of non-null elements contained within the set.	None
CTerm(n1, n2, n3)	Returns the number of periods needed for an investment earning a fixed, but compounded, interest rate to grow to a future value.	None
Date()	Returns the current system date as the number of days since the epoch.	Date.getDate() The JavaScript Date object does not use the epoch as a reference point.
Date2Num(d1 [, f1 [, k1]])	Returns the number of days since the epoch, given a date string.	The JavaScript Date object does not use the epoch as a reference point.
DateFmt([n1 [, k1]])	Returns a date format string, given a date format style.	None
Decode(s1 [, s2])	Returns the decoded version of a given string.	Partial support JavaScript only supports URL encoded values that contain no escape characters.

FormCalc function	Description	JavaScript method equivalent
Encode(s1 [, s2])	Returns the encoded version of a given string.	Partial support JavaScript only supports URL encoded values that contain no escape characters.
Eval()	Returns the value of a given form calculation.	eval(s1)
Exists(v1)	Determines whether the given parameter is a valid reference syntax to an existing object.	None
Floor(n1)	Returns the largest whole number that is less than or equal to the given value.	Math.floor(n1)
Format(s1, s2)	Formats the given data according to the specified picture format string.	None
FV(n1, n2, n3)	Returns the future value of consistent payment amounts made at regular intervals at a constant interest rate.	None
Get(s1)	Downloads the contents of the given URL.	None
HasValue(v1)	Determines whether the given parameter is a valid reference syntax with a non-null, non-empty, or non-blank value.	None
IPmt(n1, n2, n3, n4, n5)	Returns the amount of interest paid on a loan over a set time.	None
IsoDate2Num(d1)	Returns the number of days since the epoch, given a valid date string.	None
IsoTime2Num(d1)	Returns the number of milliseconds since the epoch, given a valid time string.	None
Left(s1, n1)	Extracts a specified number of characters from a string, starting with the first character on the left.	String.substring(n1, n2)
Len(s1)	Returns the number of characters in a given string.	String.length
LocalDateFormat([n1 [, k1]])	Returns a localized date format string, given a date format style.	None
LocalTimeFmt([n1 [, k1]])	Returns a localized time format string, given a time format style.	None
Lower(s1 [, k1])	Converts all uppercase characters within a specified string to lowercase characters.	String.toLowerCase(s1)
Ltrim(s1)	Returns a string with all leading white space characters removed.	None You can use JavaScript regular expressions to perform this operation.
Max(n1 [, n2...])	Returns the maximum value of the non-null elements in the given set of numbers.	Math.max(n1, n2)

FormCalc function	Description	JavaScript method equivalent
Min(n1 [, n2...])	Returns the minimum value of the non-null elements of the given set of numbers.	Math.min(n1, n2)
Mod(n1, n2)	Returns the modulus of one number divided by another.	Use the modulo (%) operator.
NPV(n1, n2 [, ...])	Returns the net present value of an investment based on a discount rate and a series of periodic future cash flows.	None
Num2Date(n1[, f1 [, k1]])	Returns a date string given a number of days since the epoch.	None
Num2GMTTime(n1 [,f1 [, k1]])	Returns a GMT time string given a number of milliseconds from the epoch.	None
Num2Time(n1 [,f1 [, k1]])	Returns a time string given a number of milliseconds from the epoch.	None
Oneof(s1, s2 [, s3...])	Returns true (1) if a value is in a given set and false (0) if it is not.	None This function is similar to the String.search(<i>s1</i>) method and String.match(<i>expression</i>) method.
Parse(s1, s2)	Analyzes the given data according to the given picture format.	None
Pmt(n1, n2, n3)	Returns the payment for a loan based on constant payments and a constant interest rate.	None
Post(s1, s2 [, s3 [, s4 [, s5]]])	Posts the given data to the specified URL.	None
PPmt(n1, n2, n3, n4, n5)	Returns the amount of principal paid on a loan over a period of time.	None
Put(s1, s2 [, s3])	Uploads the given data to the specified URL.	None
PV(n1, n2, n3)	Returns the present value of an investment of periodic constant payments at a constant interest rate.	None
Rate(n1, n2, n3)	Returns the compound interest rate per period required for an investment to grow from present to future value in a given period.	None
Ref()	Returns a reference to an existing object.	None
Replace(s1, s2 [, s3])	Replaces all occurrences of one string with another within a specified string.	String.replace(s1, s2)
Right(s1, n1)	Extracts several characters from a given string, beginning with the last character on the right.	String.substring(n1, n2)

FormCalc function	Description	JavaScript method equivalent
Round(n1 [, n2])	Evaluates a given numeric value or expression and returns a number rounded to the given number of decimal places. For more accurate results, set a legacy flag in xfa.xci. To switch to the default behavior, remove the legacy flag.	Math.round(n1)
Rtrim(s1)	Returns a string with all trailing white space characters removed.	None You can use JavaScript regular expressions to perform this operation.
Space(n1)	Returns a string consisting of a given number of blank spaces.	None
Str(n1 [, n2 [, n3]])	Converts a number to a character string. FormCalc formats the result to the specified width and rounds to the specified number of decimal places.	String(n1) or Number.toString(radix)
Stuff(s1, n1, n2 [, s2])	Inserts a string into another string.	None
Substr(s1, n1, n2)	Extracts a portion of a given string.	String.substring(n1, n2)
Sum(n1 [, n2...])	Returns the sum of the non-null elements of a given set of numbers.	None
Term(n1, n2, n3)	Returns the number of periods required to reach a given future value from periodic constant payments into an interest-bearing account.	None
Time()	Returns the current system time as the number of milliseconds since the epoch.	Date.getTime() The JavaScript Date object does not use the epoch as a reference point.
Time2Num(d1 [, f1 [, k1]])	Returns the number of milliseconds since the epoch, given a time string.	None
TimeFmt([n1 [, k1]])	Returns a time format, given a time format style.	None
UnitType(s1)	Returns the units of a unitspan. A <i>unitspan</i> is a string consisting of a number followed by a unit name.	None
UnitValue(s1 [, s2])	Returns the numeric value of a measurement with its associated unitspan after an optional unit conversion.	None
Upper(s1 [, k1])	Converts all lowercase characters within a string to uppercase.	String.toUpperCase()
Uuid(n1)	Returns a Universally Unique Identifier (UUID) string to use as an identification method.	None
Within(s1, s2, s3)	Returns true (1) if the test value is within a given range, and false (0) if it is not.	String.search(s1)
WordNum(n1 [, n2 [, k1]])	Returns the English text equivalent of a given number.	None

More Help topics

[“Using FormCalc” on page 53](#)

Using FormCalc

FormCalc is a simple yet powerful calculation language modeled on common spreadsheet software. Its purpose is to facilitate fast and efficient form design without requiring a knowledge of traditional scripting techniques or languages. Using several of the built-in functions, inexperienced FormCalc users can quickly create forms that save users from performing time-consuming calculations, validations, and other verifications. This way, you can create a basic set of rules for the form design that allows the resulting form to react according to the data it comes into contact with.

Within Designer, FormCalc is the default scripting language in all scripting locations with JavaScript as the alternative. For information on setting your default scripting language, see “[Configuring Designer for Scripting](#)” on page 8.

FormCalc treats each new line in the Script Editor as a new expression to evaluate.

More Help topics

[“Using JavaScript” on page 56](#)

Using built-in functions

The built-in functions that comprise FormCalc cover a wide range of areas, including mathematics, dates and times, strings, finance, logic, and the web. These areas represent the types of functionality that usually occur in forms. The purpose of the functions is to provide quick and easy manipulation of form data in a useful way.

At the most basic level, a calculation can consist of only a single FormCalc function. However, a single FormCalc function can use other FormCalc functions as parameters.

To attach a FormCalc function to an object

You can add a FormCalc function to any form design object that allows calculations and scripts, except for the script object.

- 1 Make sure that you have the multiline version of the Script Editor displayed in the Designer workspace.
- 2 Select a field on your form.
- 3 In the Show list, select the calculate event.
- 4 Click the Functions icon or F10 to display a list of FormCalc functions.
- 5 Select the appropriate function and press Enter.
- 6 Replace the default function syntax notation with your own set of values.
- 7 Click the Preview PDF tab to test the form.

Built-in function syntax

Each FormCalc function uses a specific syntax notation that you must follow in order for the function to execute correctly. This table describes, generally, the pieces of syntax notation.

Syntax notation	Replacement values
d	A valid date string (for example, 03/15/1996)
f	A valid date format string (for example, MM/DD/YYYY)
k	A valid locale identifier (for example, fr_FR)
n	A valid numeric value. Notice that the range of valid values varies from function to function.
s	A valid unit of measurement (for example, "in" for inches).
v	A valid reference syntax.
n1, n2, n3	All values are required.
[[n [, k]]]	No values are required, but you can choose to specify just n, or both n and k.
n1 [, n2 ...]	n1 is required, but you can choose to specify an unlimited number of additional values.
d [, f [, k]]	d is required, but you can choose to also specify f or both f and k.

More Help topics

[“Creating basic calculations” on page 54](#)

[“Using FormCalc” on page 53](#)

Creating basic calculations

About basic calculations

Simple expressions are the most basic instances of scripting. These expressions do not involve using FormCalc built-in functions and are never more than a single line. Add simple expressions to the calculate event of a particular field or object so that the expression value can output onto your form.

Examples of basic calculations

These examples are all of simple expressions:

```
2
"abc"
2 - 3 * 10 / 2 + 7
```

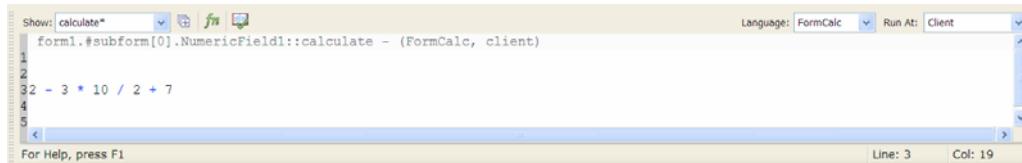
Each simple expression evaluates to a single value by following a traditional order of operations, even if the order is not always obvious from the expression syntax. For example, the following sets of expressions produce equivalent results.

Expression	Equivalent to	Result
"abc"	"abc"	abc
2 - 3 * 10 / 2 + 7	2 - (3 * 10 / 2) + 7	-6
(10 + 2) * (5 + 4)	(10 + 2) * (5 + 4)	108
0 and 1 or 2 > 1	(0 and 1) or (2 > 1)	1 (true)
2 < 3 not 1 == 1	(2 < 3) not (1 == 1)	0 (false)

As implied in the previous table, all FormCalc operators carry a certain precedence when they appear within expressions. The following table illustrates this operator hierarchy.

Precedence	Operator
Highest	=
	(Unary) -, +, not
	*, /
	+, -
	<, <=, >, >=, lt, le, gt, ge
	==, <>, eq, ne
	&, and
Lowest	, or

All the previous examples are valid, simple expressions that you can add to a form field or object that accepts calculations and scripts. For example, if you create a form in Designer with a single numeric field, add the following calculation to the calculate event in the Script Editor.

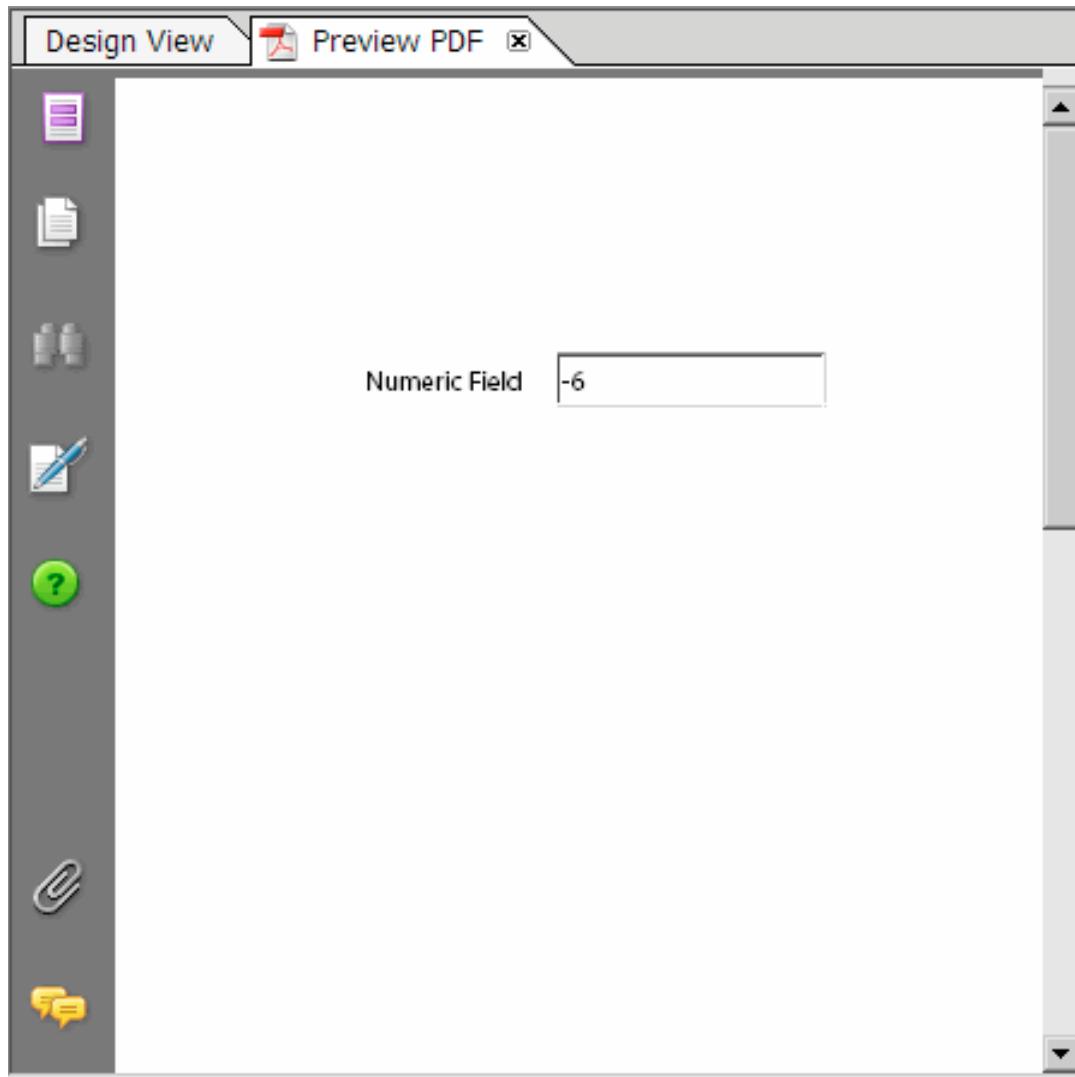


The screenshot shows the SAP Script Editor interface. The title bar says "Show: calculate*" and "Language: FormCalc Run At: Client". The editor window contains the following code:

```
form1#subform[0].NumericField1::calculate - (FormCalc, client)
1
2
3 2 - 3 * 10 / 2 + 7
4
5
```

The status bar at the bottom indicates "For Help, press F1" and shows "Line: 3 Col: 19".

Then, when you click the Preview PDF tab to view the completed form, the value of the simple expression appears in the text field.



If the value does not appear in the preview, ensure that your simple expression appears in the calculate event of the form design object. Also, ensure that you installed Designer and Acrobat correctly.

More Help topics

[“Using FormCalc” on page 53](#)

[“Using JavaScript” on page 56](#)

Using JavaScript

To allow form designers more flexibility and scripting power, Designer supports the use of JavaScript version 1.6 or earlier in all situations that support scripting.

Form developers who are familiar with JavaScript can apply their existing expertise directly to Designer. Designer provides several properties and methods that enhance JavaScript so that you can access field and object values. These properties and methods combined with the Designer reference syntax provide you with easy manipulation of form values and data.

Note: The Script Editor does not provide syntax error checking for scripts created using JavaScript. In addition, statement completion options do not appear for standard JavaScript objects or methods.

More Help topics

[“Creating scripts using JavaScript” on page 57](#)

Creating scripts using JavaScript

Creating scripts in Designer using JavaScript is similar to creating JavaScript in other applications. You can take advantage of previous knowledge of JavaScript concepts, reuse JavaScript functions using the Designer script object, and take advantage of JavaScript language functionality.

However, notice that although previous JavaScript knowledge is transferable, to effectively use JavaScript on your form design, you must understand how to construct Designer reference syntax. Specifically, you must know how to correctly use the XML Form Object Model reference syntax to access objects on your form design.

This table outlines the key concepts for developing scripts in JavaScript for Designer. The table also provides the location for more information on each concept within the *Designer Help*.

Key concept	For more information see...
Creating references to object properties and values, including using the <code>resolveNode</code> method.	“Referencing object properties and values” on page 65 “<code>resolveNode</code>” “To use statement completion to create calculations and scripts” on page 16
Using the host and event models to test and debug your form.	“Testing and debugging calculations and scripts” on page 19 “Referencing object properties and values” on page 65
Using a script object to reuse your existing JavaScript functions.	“Creating and Reusing JavaScript Functions” on page 76

In addition to the resources available in the *Designer Help*, the [Developer Center](#) contains extensive scripting resources and documentation.

More Help topics

[“Enforcing strict scoping rules in JavaScript” on page 57](#)

[“To attach a JavaScript script to an object” on page 61](#)

[“Using JavaScript” on page 56](#)

Enforcing strict scoping rules in JavaScript

When working with JavaScript in forms, it is important to declare objects and variables within the scope they are intended. Globally declaring objects or variables unnecessarily can cause performance problems.

Strict scoping was introduced in Designer 8.1 to improve the run time and memory usage of a form. Strict scoping is enabled, by default, in Designer, for new forms. For old forms the option to enable strict scoping is available.

What is scope in JavaScript?

Scope works outwardly so that everything within curly brackets ({}) can see outside them. However anything outside the curly brackets cannot access anything inside them.

In the following example, the first curly bracket opens the function scope and the second one closes it. Everything between the curly brackets is within the scope of foo () .

```
noutsidevar is outside
the scope of foo() -> var noutsidevar = 2;
                           function foo()

This opens the function scope -> {
                           // Everything between the two
                           // curly braces is within the
                           // scope of foo()
                           var nFooVar = 4;

This closes the function scope -> }
```

The scope in the following example is valid because var nFooVar = nOutsideVar inside the curly brackets can see var nOutsideVar = 2 outside the curly brackets.

```
var nOutsideVar = 2;

function foo()
{
    var nFooVar = nOutsideVar; // This is correct;
                            // anything inside the
                            // braces can see stuff
                            // outside
}
```

In contrast, the following example shows an invalid scope because `var nOutsideVar = nFooVar` cannot access `var nFooVar = 4` within the curly brackets.

```
function foo()
{
    var nFooVar = 4;

    var nOutsideVar = nFooVar; // This is incorrect,
                                // nOutsideVar cannot access
                                // things declared within
                                // foo()'s scope
```

Scope in scripting describes pieces of scripts that can access pieces. These pieces of script can be variables or functions.

What is scope XML?

Scope in a form design is about hierarchy. For example, to access the subform `inside` in the following XML source, you must type `outside.inside`.

```
<subform name="outside">
    <subform name="inside">
        ...
    </subform>
</subform>
```

You do not type `inside.outside` because you must access the outermost subform first and drill inwards.

SOM expressions and scope

In forms that are targeted for Acrobat or Adobe Reader 8.1, SOM expressions are properly scoped as shown in this example:

```
<subform name="a">
    <subform name="b"/>
```

In forms targeted for Acrobat or Adobe Reader 8.0, the SOM expression `a.b.a` returns the subform `a`. In forms targeted for Acrobat or Adobe Reader 8.1, the SOM expression `a.b.a` returns `null` because subform `b` does not have a child named `a`. In Acrobat or Adobe Reader 9.0 or later, the expression returns an error because `a` is not a valid child of `b`.

In Acrobat or Adobe Reader 8.1, functions and variable within a node's script do not become global (script objects being the exception) as shown in this example:

```
<field name="field1">

    event activity="initialize">

        <script contentType="application/x-javascript">

            // Function bar() is scoped to field1.initialize; nothing outside <event
activity="initialize"> scope can see inside here (in 8.1)

            function bar()

            {

                return "bar";

            }

        </script>

    </event>

</field>

field name="field2">

    <event activity="click">

        <script contentType="application/x-javascript">

            field1.bar();

        </script>

    </event>

</field>
```

When you click `field 2` in a form targeting Acrobat or Adobe Reader 8.0, the function `bar()` executes.

When you click `field 2` in a form targeting Acrobat or Adobe Reader 8.1, the function `bar()` does not execute. The reason is because function `bar()` is available only from within the initialized script of `field1`.

Scoping and script objects

Script objects have global scope; therefore, anyone can access them from anywhere. If you have a method that you want both `field1.initialize` and `field2.click` to access, place it in a script object. Strict scoping means that you cannot call `bar()` from anywhere in a form. You also get a run-time error indicating that the function `bar()` could not be resolved. The script engine looked for `bar()` within the scope that you have access to and did not find it.

Scoping and target version

If you use strict scoping, remember that you get performance improvements in forms targeted for Acrobat or Adobe Reader 8.1 and later. Avoid using strict scoping in forms targeted for older versions of Acrobat or Adobe Reader. Otherwise, the scripts in the forms can work differently. For existing forms, back up the form before you enable strict scoping and always verify the script afterwards. When you enable strict scoping and then change the target version to earlier than Acrobat or Adobe Reader 8.1, warning messages appear.

When to use scoping

When a form is targeted for Acrobat or Adobe Reader 8.1 and strict scoping is on, declared JavaScript variables are released after each script executes. When a form is targeted for Acrobat or Adobe Reader 9.0 and later, strict scoping does not release all the JavaScript variables. The exception is when you remerge or import new data.

The performance enhancements with strict scoping rules apply to forms targeted for Acrobat or Adobe Reader 8.1 and later. Do not apply strict scoping rules to forms that are targeted for versions of Acrobat or Adobe Reader earlier than 8. Otherwise, the scripts can behave differently or not work.

To enable strict scoping

- 1 Select File > Form Properties and click the Run-time tab.
- 2 Select Enforce Strict Scoping Rules In JavaScript , if the option is available, and then click OK.

Note: If the option to enforce strict scoping rules is not available in the Run-time tab, then strict scoping is already enabled.

More Help topics

[“Using JavaScript” on page 56](#)

[“To attach a JavaScript script to an object” on page 61](#)

To attach a JavaScript script to an object

You can add a JavaScript script to any form design object that allows calculations and scripts, including the script object.

- 1 Make sure that you have the multiline version of the Script Editor displayed in the Designer workspace.
- 2 Select a field on your form. For example, add a new text field to your form design.
- 3 In the Show list, select a valid event. For example, using the new text field, select the docReady event.
- 4 In the Run At list, select where you want the script to execute. For example, for the new text field, select Client.
- 5 Click the Functions icon  or F10 to display a list of JavaScript functions.
- 6 Select the desired function, and press Enter.
- 7 Replace the default function syntax notation with your own set of values. Alternatively, you can create your own script manually in the Script Source field of the Script Editor. For example, in the new text field, add the following JavaScript to the Script Source field:

```
this.border.fill.color.value = "255,0,0";
```

- 8 Click the Preview PDF tab to test the form. The text appears red for the new button object when the form is displayed in the Preview PDF tab.

More Help topics

[“Using JavaScript” on page 56](#)

Chapter 7: Variables

You can define form variables in Designer to store specific information in a central, accessible location. A *variable* typically acts as a placeholder for text that you might have to change in the future. Form variables in Designer are always of the type "string". For example, a variable can store the text of a message box title. When the text needs to change, all you have to do is open the affected form or template and update the text once through the variable definition. Designer automatically propagates the new text across all instances of the inserted variable.

Keep in mind that form variables are defined outside of the Script Editor, and are accessible by scripts on all objects on a form, as opposed to scripting variables that you create in a specific FormCalc or JavaScript script.

You can create, view, and delete variables without using scripting. However, you must use scripting to access the values stored by variables and manipulate them, or to apply the values to objects on your form.

Note: Form variable values reset each time you open a form.

Before you create a variable, decide the name of the variable and the text that it will contain. Variable definitions are saved with the form or template.

Naming variables

At run time, naming conflicts occur when the names of variables are identical to those used as XML Form Object Model properties, methods, or form design field names. These conflicts can cause scripts to return unexpected values; therefore, it is important to give each variable a unique name. Here a couple of examples:

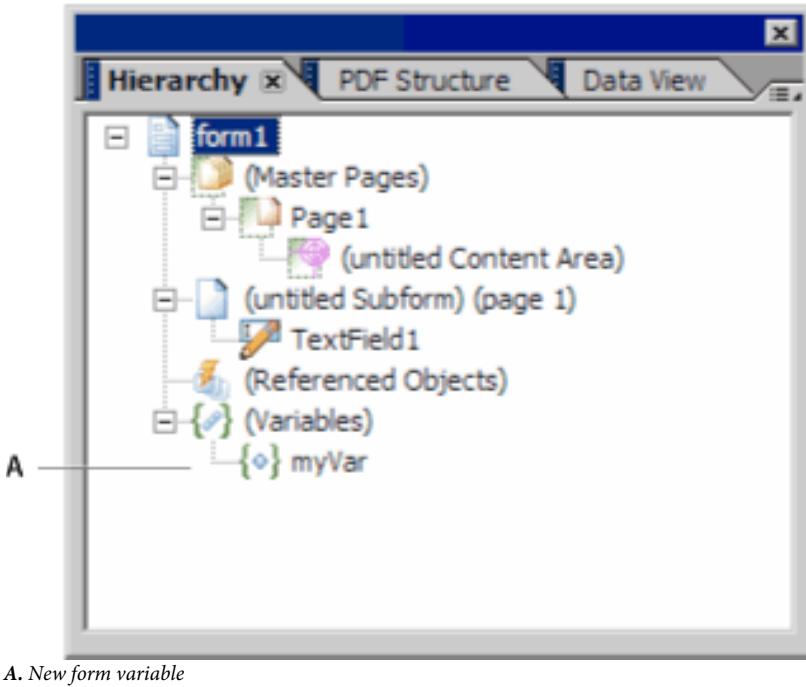
- Use the variable name `fieldWidth` and `fieldHeight` instead of `x` and `y`.
- Use the form design object name `clientName` instead of `name`.

Note: Variable names are case-sensitive and should not contain spaces.

To define a text variable

- 1 Select Edit > Form Properties.
- 2 In the Variables tab, click New (Insert) .
- 3 In the Variables list, type a unique name for the variable and press Enter. Variable names are case-sensitive and should not contain spaces.
- 4 Click once in the box to the right and type the text you want to associate with the variable.

The variable appears in the Hierarchy palette at the form level.



To view a text variable definition

- 1 Select Edit > Form Properties.
- 2 Click the Variables tab and select the variable from the Variables list. The associated text is displayed in the box to the right.

To delete a text variable

- 1 Select Edit > Form Properties.
- 2 In the Variables tab, select the variable and click Delete (Delete) .

Using variables in calculations and scripts

After you have created form variables, you only need to reference the variable name in your calculations and scripts in order to obtain the value of the variable.

Important: When naming variables, you should avoid using names that are identical to the names of any XML Form Object Model properties, methods, or object names.

For information about XML Form Object Model properties, methods, and objects, see the [Scripting Reference](#).

For example, create the following form variable definitions.

Variables

Variable name	Value
firstName	Tony
lastName	Blue
age	32

In FormCalc, you can access the variable values in the same manner that you access field and object values. In this example, the values are assigned to three separate fields:

```
TextField1 = firstName  
TextField2 = lastName  
NumericField1 = age
```

You can also use variables in FormCalc functions in the same way, as shown in this example:

```
Concat( "Dear ", firstName, lastName )
```

In JavaScript, you reference variable values by using the `.value` property instead of the `.rawValue` property that is used for field and object values, as shown in this example:

```
TextField1.rawValue = firstName.value;
```

Note: Using and modifying form variables with scripting in XFA forms can cause the document message bar in Acrobat and Adobe Reader to display a signature validation status warning indicating that the signature validity is unknown due to subsequent changes to the document.

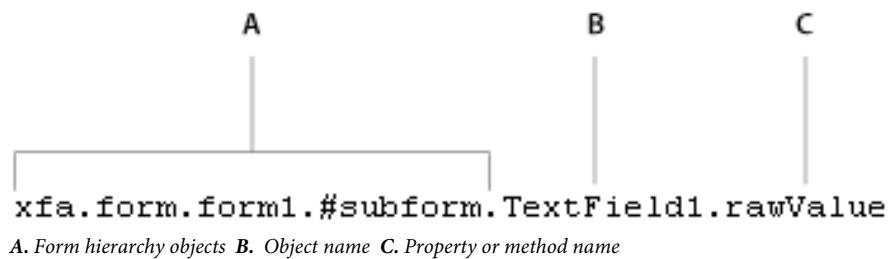
Chapter 8: Referencing Objects in Calculations and Scripts

Although both FormCalc calculations and JavaScript scripts have rules for structuring code, both rely on the same reference syntax when accessing form object properties and values. The XML Form Object Model provides a structured way to access object properties and values through a compound naming convention with each object, property, and method separated by dot (.) characters.

In general, each reference syntax has a similar structure divided into the following sections:

- The names of the parent objects in the form hierarchy that is used to navigate to a specific field or object. You can use the Hierarchy palette and Data View palette to determine the location of an object relative to other objects in the form and in any associated data.
- The name of the object you want to reference.
- The name of the property or method you want to access. This section may also include XML Form Object Model objects that precede the property or method in the structure but that do not appear as objects in the Hierarchy palette.

For example, the following illustration shows the reference syntax for accessing the value of a text field on a form design that uses the default object-naming conventions:



Note: By default, the subform object that represents the first page of a new form is unnamed. In the reference syntax above, the unnamed subform is represented by `#subform`.

The reference syntax notation structure varies slightly, depending on the specific situation. For example, a fully qualified reference syntax works in any situation; however, in some cases, you can use a shortened reference syntax or a reference syntax shortcut to reduce the size of the syntax.

Referencing object properties and values

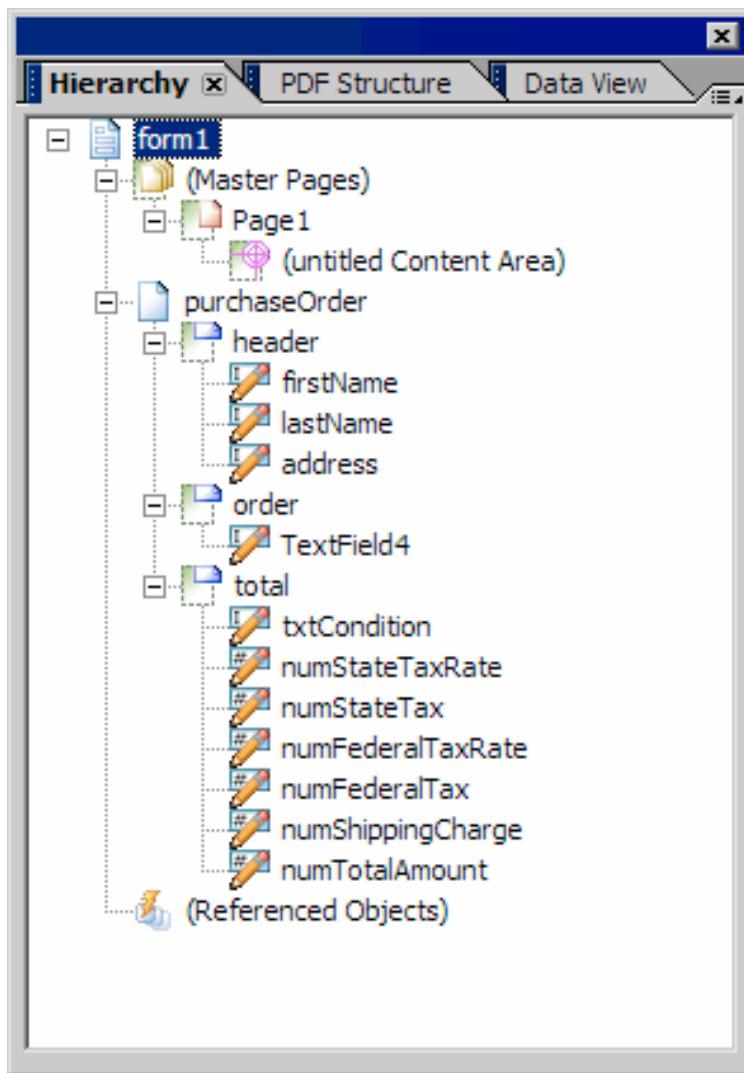
The reference syntax you use to access or modify object properties and values takes one of the following forms:

Fully qualified Reference syntax includes the full object hierarchy, beginning with the `xfa` root node. The fully qualified syntax accurately accesses the property or value of an object regardless of where the calculation or script that contains the reference syntax is located.

Abbreviated The reference syntax is shortened either because of the relative positioning of the calculation or script that contains the reference syntax and the object syntax references, or because shortcuts are used. In general, although

an abbreviated reference syntax is faster to create, the disadvantage is that it works only as long as the objects remain in the same positions relative to each other.

For example, this illustration shows the hierarchy of a sample purchase order form.



This illustration shows a fully qualified reference syntax, for both FormCalc and JavaScript, to access the value of the txtCondition field. This reference syntax could be used as part of a calculation or script on any object on the form.

A B C D E F G

| | | | | | |

xfa.form.form1.purchaseOrder.total.txtCondition.rawValue

A. Root Node B. Model C. Form design root node D. Page object E. Subform name F. Object name G. Property or method name

Note: Even though the reference syntax is common to both FormCalc and JavaScript, you must observe the conventions for each scripting language. For example, the reference syntax in the example above works as is for FormCalc; however, you would need to include a trailing semicolon (;) character for JavaScript.

If two objects exist in the same container, such as a subform, they are referred to as sharing the same context. Where objects exist in the same context, you can use an abbreviated reference syntax that includes only the name of the object followed by the property or method you want to access. For example, using the example from above, the following abbreviated reference syntax accesses the value of the `txtCondition` field from any of the fields in the `total` subform:

```
txtCondition.rawValue
```

If two objects exist in different containers, they do not share the same context. In this case, you can use an abbreviated reference syntax; however, the syntax must begin with the name of the highest level container object that the two objects do not have in common. For example, using the hierarchy above, the following abbreviated reference syntax accesses the value of the `address` field from the `txtCondition` field:

```
header.address.rawValue
```

Due to the way the XML Form Object Model is structured, some object properties and methods exist on child objects of the objects on the form. These child objects exist only as part of the XML Form Object Model and do not appear in the Hierarchy and Data View palettes. To access these properties and methods, you must include the child objects in the reference syntax. For example, the following reference syntax sets the tool tip text for the `txtCondition` field:

```
txtCondition.assist.toolTip.value = "Conditions of purchase." // FormCalc  
txtCondition.assist.toolTip.value = "Conditions of purchase."; // JavaScript
```

For more information about the XML Form Object model objects and their structure, see [Scripting Reference](#).

More Help topics

[“Referencing Objects in Calculations and Scripts” on page 65](#)

[“Referencing unnamed and repeated objects” on page 67](#)

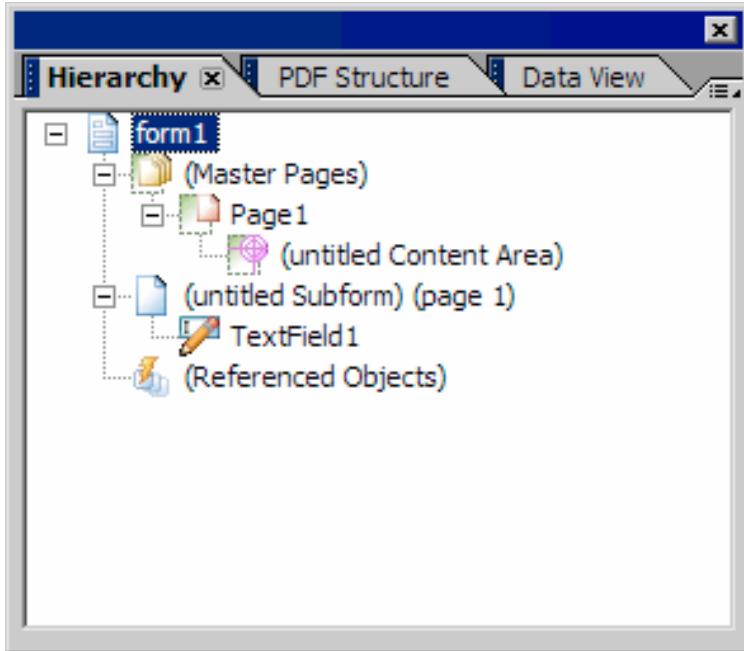
[“Referencing the current object” on page 69](#)

[“FormCalc reference syntax shortcuts” on page 69](#)

Referencing unnamed and repeated objects

Designer supports the capability to create both unnamed objects and multiple objects with the same name. You can still create calculations and scripts to access and modify properties and values of unnamed objects by using the number sign (#) notation and object occurrence values using the square bracket ([]) notation. FormCalc correctly interprets the number sign (#) and square bracket ([]) characters; however, JavaScript does not. To access the value of a text field in a situation where the number sign (#) or square brackets ([]) occur, using JavaScript, you must use the `resolveNode` method in conjunction with either a fully qualified reference syntax or an abbreviated reference syntax.

For example, when you create a new blank form, by default, the name of the subform that represents the page of the form is an unnamed subform with an occurrence value of 0. The following illustration shows the form hierarchy on a new form with default object naming.



The unnamed subform that represents the first page of the form has an occurrence number of 0. In this situation, both of the following reference syntaxes access the value of the text field in the form hierarchy above on a new form that uses default naming conditions:

```
xfa.form.form1.#subform.TextField1.rawValue  
xfa.form.form1.#subform[0].TextField1.rawValue
```

Note: By default, if you do not specify an occurrence value for an object, the reference syntax accesses the first occurrence of that object.

FormCalc recognizes the fully qualified reference syntax above and interprets it directly. To access the same value by using JavaScript, you must use one of these forms of the `resolveNode` scripting method:

```
xfa.resolveNode("xfa.form.form1.#subform.TextField1").rawValue;  
xfa.resolveNode("xfa.form.form1.#subform[0].TextField1").rawValue;
```

If you add a new page to your form, by default, the name of the subform that represents the new page is unnamed; however, the occurrence value for the new subform is set to 1. You can specify the new unnamed subform by using a similar reference syntax as above:

```
xfa.form.form1.#subform[1].TextField1.rawValue // FormCalc  
xfa.resolveNode("xfa.form.form1.#subform[1].TextField1").rawValue; // JavaScript
```

Note: The statement completion options available in the Script Editor include unnamed objects at the beginning of the list. Objects that have multiple occurrence values appear only once in the list, representing the first occurrence of the object. If you want to access an occurrence value other than the first occurrence, you must manually add the occurrence value to the reference syntax.

You can use the `resolveNode` method to reference objects within other reference syntax statements. This can help to reduce the amount of scripting you need to reference a particular object, property, or method. For example, you could simplify the reference syntax that points to a text field on the second page of your form to the following statement:

```
xfa.form.form1.resolveNode("#subform[1].TextField1").rawValue; // JavaScript
```

For more information on the `resolveNode` method, see [resolveNode](#).

More Help topics

[“Referencing Objects in Calculations and Scripts” on page 65](#)

[“Referencing object properties and values” on page 65](#)

[“Referencing the current object” on page 69](#)

[“FormCalc reference syntax shortcuts” on page 69](#)

Referencing the current object

If you want to change properties or values of the current object using calculations or scripts attached to the object itself, both FormCalc and JavaScript use unique shortcuts to reduce the size of the reference syntax. FormCalc uses the number sign (\$) character to denote the current object, and JavaScript uses the keyword `this`.

For example, the following reference syntax returns the value of the current object:

```
$ // FormCalc  
this.rawValue // JavaScript
```

Similarly, you can use the dollar sign (\$) shortcut and the keyword `this` to replace the name of the current object when accessing object properties in calculations and scripts. For example, the following reference syntax changes the tool tip text associated with the current object:

```
$.assist.toolTip.value = "This is some tool tip text." // FormCalc  
this.assist.toolTip.value = "This is some tool tip text."; // JavaScript
```

More Help topics

[“Referencing Objects in Calculations and Scripts” on page 65](#)

[“Referencing object properties and values” on page 65](#)

[“Referencing unnamed and repeated objects” on page 67](#)

[“FormCalc reference syntax shortcuts” on page 69](#)

FormCalc reference syntax shortcuts

To make accessing object properties and values easier, FormCalc includes shortcuts to reduce the effort required to create references. This section describes the reference syntax shortcuts for FormCalc.

Current field or object

Refers to the current field or object

Notation

\$

Example

```
$ = "Tony Blue"
```

The above example sets the value of the current field or object to Tony Blue.

Data model root of xfa.datasets.data

Represents the root of the data model xfa.datasets.data.

Notation

\$data

Example

```
$data.purchaseOrder.total
```

is equivalent to

```
xfa.datasets.data.purchaseOrder.total
```

Form object event

Represents the current form object event.

Notation

\$event

Example

```
$event.name
```

is equivalent to

```
xfa.event.name
```

For more information see “[Working with the Event Model](#)” on page 89.

Form model root

Represents the root of the form model xfa.form.

Notation

\$form

Example

```
$form.purchaseOrder.tax
```

is equivalent to stating

```
xfa.form.purchaseOrder.tax
```

Host object

Represents the host object.

Notation

`$host`

Example

`$host.messageBox("Hello world")`

is equivalent to

`xfa.host.messageBox("Hello world")`

For more information, see “[Working with a Host Application](#)” on page 86.

Layout model root

Represents the root of the layout model `xfa.layout`.

Notation

`$layout`

Example

`$layout.ready`

is equivalent to stating

`xfa.layout.ready`

Collection of data record

Represents the current record of a collection of data, such as from an XML file.

Notation

`$record`

Example

`$record.header.txtOrderedByCity`

references the `txtOrderedByCity` node within the header node of the current XML data.

Template model root

Represents the root of the template model `xfa.template`.

Notation

`$template`

Example

`$template.purchaseOrder.item`

is equivalent to

```
xfa.template.purchaseOrder.item
```

Data model root of xfa.datasets

Represents the root of the data model xfa.datasets.

Notation

!

Example

```
!data
```

is equivalent to

```
xfa.datasets.data
```

Select all form objects

Selects all form objects within a given container, such as a subform, regardless of name, or selects all objects that have a similar name.

You can use the '*' (asterisk) syntax with JavaScript if it used with the [resolveNode](#) method.

Notation

*

Example

For example, the following expression selects all objects named item on a form:

```
xfa.form.form1.item[*]
```

Search for objects that are part of a subcontainer

You can use two dots at any point in your reference syntax to search for objects that are a part of any subcontainer of the current container object, such as a subform.

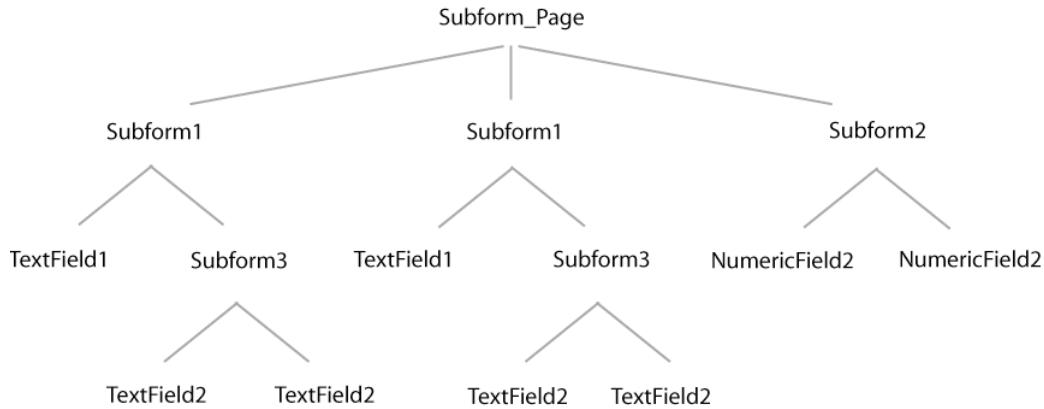
You can use the '..' (double period) syntax with JavaScript if it used with the [resolveNode](#) method.

Notation

..

Example

The expression `Subform_Page..Subform2` means locate the node `Subform_Page` (as usual) and find a descendant of `Subform_Page` called `Subform2`.



Using the example tree above,

`Subform_Page..TextField2`

is equivalent to

`Subform_Page.Subform1[0].Subform3.TextField2[0]`

because `TextField2[0]` is in the first `Subform1` node that FormCalc encounters on its search. As a second example,

`Subform_Page..Subform3[*]`

returns all four `TextField2` objects.

Denote an unnamed object or specify a property

The number sign (#) notation is used to denote one of the following items in a reference syntax:

- An unnamed object
- Specify a property in a reference syntax if a property and an object have the same name

You can use the '#' (number sign) syntax with JavaScript if it is used with the `resolveNode` method.

Notation

#

Example

The following reference syntax accesses an unnamed subform:

`xfa.form.form1.#subform`

The following reference syntax accesses the `name` property of a subform if the subform also contains a field named `name`:

`xfa.form.form1.#subform.#name`

Occurrence value of an object

The square bracket ([]) notation denotes the occurrence value of an object.

In language-specific forms for Arabic, Hebrew, Thai, and Vietnamese, the reference syntax is always on the right (even for right-to-left languages).

Notation

[]

Example

To construct an occurrence value reference, place square brackets ([]) after an object name, and enclose within the brackets one of the following values:

- [n], where n is an absolute occurrence index number beginning at 0. An occurrence number that is out of range does not return a value. For example,

`xfa.form.form1.#subform.Quantity[3]`

refers to the fourth occurrence of the Quantity object.

- [+/ - n], where n indicates an occurrence relative to the occurrence of the object making the reference. Positive values yield higher occurrence numbers, and negative values yield lower occurrence numbers. For example,

`xfa.form.form1.#subform.Quantity[+2]`

This reference yields the occurrence of Quantity whose occurrence number is two more than the occurrence number of the container making the reference. For example, if this reference was attached to the `Quantity[2]` object , the reference would be the same as

`xfa.template.Quantity[4]`

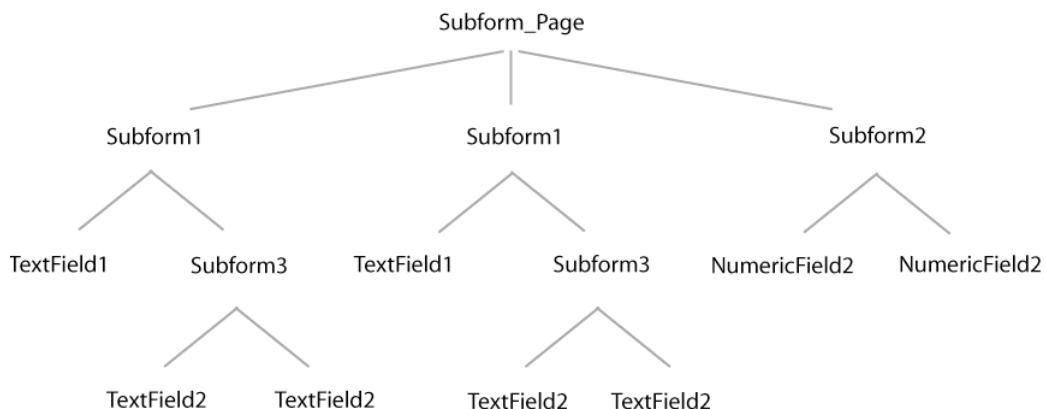
If the computed index number is out of range, the reference returns an error.

The most common use of this syntax is for locating the previous or next occurrence of a particular object. For example, every occurrence of the Quantity object (except the first) might use `Quantity[-1]` to get the value of the previous Quantity object.

- [*] indicates multiple occurrences of an object. The first named object is found, and objects of the same name that are siblings to the first are returned. Note that using this notation returns a collection of objects. For example,

`xfa.form.form1.#subform.Quantity[*]`

- This expression refers to all objects with a name of `Quantity` that are siblings to the first occurrence of `Quantity` found by the reference.



Using the tree for reference, these expressions return the following objects:

- `Subform_Page.Subform1[*]` returns both `Subform1` objects.
- `Subform_Page.Subform1.Subform3.TextField2[*]` returns two `TextField2` objects. `Subform_Page.Subform1` resolves to the first `Subform1` object on the left, and `TextField2[*]` evaluates relative to the `Subform3` object.
- `Subform_Page.Subform1[*].TextField1` returns both of the `TextField1` instances. `Subform_Page.Subform1[*]` resolves to both `Subform1` objects, and `TextField1` evaluates relative to the `Subform1` objects.
- `Subform_Page.Subform1[*].Subform3.TextField2[1]` returns the second and fourth `TextField2` objects from the left. `Subform_Page.Subform1[*]` resolves to both `Subform1` objects, and `TextField2[1]` evaluates relative to the `Subform3` objects.
- `Subform_Page.Subform1[*].Subform3[*]` returns both instances of the `Subform3` object.
- `Subform_Page.*` returns both `Subform1` objects and the `Subform2` object.
- `Subform_Page.Subform2.*` returns the two instances of the `NumericField2` object.
- You can use the ‘`[]`’ (square bracket) syntax with JavaScript if it used with the `resolveNode` method.

More Help topics

[“Referencing Objects in Calculations and Scripts”](#) on page 65

Chapter 9: Creating and Reusing JavaScript Functions

The *script object* is an object you can use to store JavaScript functions and values separately from any particular form object. Typically, you use the script object to create custom functions and methods that you want to use as part of JavaScript scripts in many locations on your form. This technique reduces the overall amount of scripting required to perform repetitive actions.

The script object only supports script written in JavaScript; however, there are no restrictions on the location where the scripts are executed, provided that the scripting language for the event that invokes the script object is set to JavaScript.

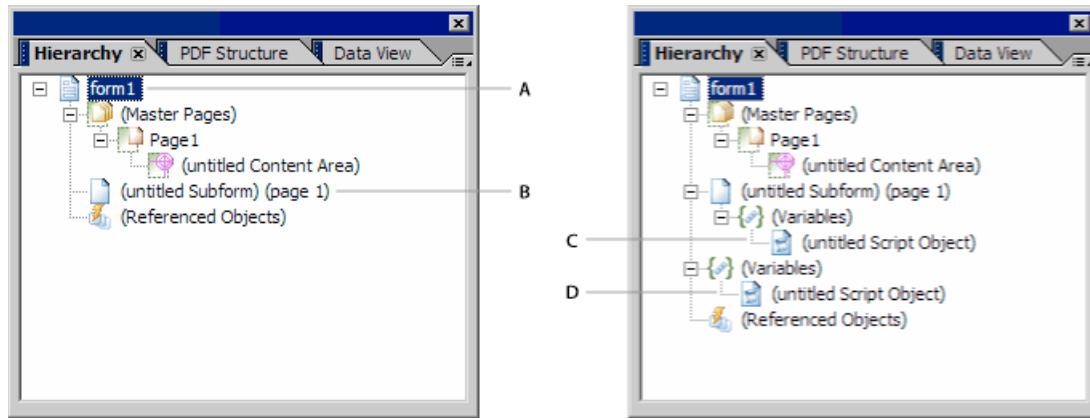
Both Acrobat and Adobe document services process scripting from a script object in the same manner, but both are also distinct.

Only scripts set to run on the client can make use of script objects set to run on the client, and vice versa.

To create a script object

There are two parts to creating a script object. The first part involves adding the object to the form design, and the second part is writing the script you want to store in the script object.

- 1 Create a new form or open an existing form.
- 2 In the Hierarchy palette, right-click either a form-level object or a subform-level object and select Insert Script Object.



A. Form level object B. Subform level object C. Subform level script object D. Form level script object

- 3 (Optional) Right-click the script object and select Rename Object.

To add script to a script object

After you have a script object on your form, you can add scripts using the Script Editor.

- 1 Select the script object in the Hierarchy palette.

The Script Editor is displayed with both a Script Object value in the Show list and a JavaScript value in the Language list. You cannot change either of these values.



- 2 Enter your script in the Script Source field.
- 3 Click the Preview PDF tab to test the form.

Example

For example, create a script object called `feedback` that contains the following function:

```
function emptyCheck(oField) {  
  
    if ((oField.rawValue == null) || (oField.rawValue == "")) {  
        xfa.host.messageBox("You must input a value for this field.", "Error Message", 3);  
    }  
}
```

To reference JavaScript functions stored in a script object

After you add scripts to a script object, you can reference the script object from any event that supports JavaScript scripts.

- 1 Select an object on your form and select an event from the Show list.
- 2 Create a reference to the script object and any functions within the script object. The following generic syntax assumes that the object where you are referencing the script object is at the same level as the script object in the form hierarchy or that the script object exists at the highest level of the form hierarchy.

```
script_object.function_name(parameter1, ...);
```

- 3 Apply the new script to the form object and test it by previewing the form using the Preview PDF tab.

Similar to referencing other objects on a form, you must provide a valid syntax when referencing the script object that includes where it exists within the form hierarchy. For more information about referencing objects in scripting, see “Referencing object properties and values” on page 65.

Example

For example, using the script object example from “To add script to a script object” on page 77, place the following JavaScript script on the exit event for a text field. Test the form using the Preview PDF tab.

Chapter 10: Using Script Fragments

A script fragment contains a script object. A script object contains reusable JavaScript functions or values that are stored separately from any particular form object, such as a date parser or a web service invocation. Typically, you use the script objects to create custom functions and methods that you want to use in many locations on a form. Using script objects reduces the overall amount of scripting required to perform repetitive actions.

Script fragments include only script objects that appear as children of variables in the Hierarchy palette. Fragments cannot contain scripts that are associated with other form objects, such as event scripts like validate, calculate, or initialize.

You create a script fragment from the Hierarchy palette.

You edit script fragments the same way as other fragments.

Script fragment properties

When you select a script fragment, the Script Object tab in the Object palette displays the fragment properties.

Source File

Sets the source file for the fragment reference. This property is visible only when the selected object is a fragment reference.

Fragment Name

Sets the name of the fragment. You can click the Frag Info button  to view the fragment information.

This property is visible when a fragment reference or a fragment that is defined in a source file is selected. When the selected object is a fragment reference, this property does not appear if the source file is not specified. The Fragment Name list includes all the fragments in the specified source file. The Custom option directly supports setting a SOM expression or an ID value as the fragment reference and supports the implementation in the XML Forms Architecture.

To create a script fragment

You can create a script fragment of common functions that you can reuse in multiple forms. To create a script fragment, you create a script object that contains the functions that you want to reuse in multiple form designs. The script fragment can include only one script object.

- 1 Create a script object.
- 2 In the Hierarchy palette, right-click the script object and select Fragments > Create Fragment.

Note: You can also create a script fragment by dragging the script object from the Hierarchy palette to the Fragment Library palette.

- 3 To use a different fragment name, in the Name box, type a name for the fragment.
- 4 (Optional) In the Description box, type a description of the fragment.

5 Select a method for creating the fragment:

- To define the fragment in a separate XDP file that is stored in the Fragment Library, select Create New Fragment In Fragment Library. In the Fragment Library list, select the Fragment Library in which to save the fragment file. To use a different file name, in the File Name box, type the file name for the fragment. If you do not want to replace the selection with the new fragment, deselect Replace Selection With Reference To New Form Fragment.
- To define the fragment in the current file, select Create New Fragment in Current Document.

6 Click OK.

To insert a script fragment

You can use script fragments to reuse JavaScript functions in multiple forms. When creating a form design, you insert a reference to an existing script fragment and the fragment appears in the form design.

You cannot insert a fragment in an XFAF document.

Note: To preview the fragments in the Fragment Library palette, select Show Preview Pane from the palette menu.

To insert a script fragment from the Fragment Library palette:

- 1 In the fragment library, select the script fragment.
- 2 Drag the fragment to a subform or variables object in the Hierarchy palette.

To insert a script fragment from the Insert menu:

- 1 Select Insert > Fragment.
- 2 Navigate to the file that contains the fragment.
- 3 Select the file and click OK. The fragment appears as a child of the variables object in the root subform

More Help topics

[“Creating and Reusing JavaScript Functions” on page 76](#)

[“To create a script object” on page 76](#)

[“To add script to a script object” on page 77](#)

Chapter 11: Debugging Calculations and Scripts

Designer includes various features and strategies for debugging calculations and scripts, depending on the scripting language you choose.

For JavaScript language script debugging, you can use the `alert` or the `messageBox` methods to provide debugging feedback. One disadvantage of this method is that you must close many message boxes. Another problem is that displaying a message box can cause differences in the form's behavior, especially if you are trying to debug a script that is setting focus to an object on your form. It is best to use `console.println` to output text to the JavaScript Console from Acrobat to debug a form.

Designer Report palette warning and validation messages

The Report palette provides warning and validation messages to help you debug a form as you design it. The Warning tab lets you view errors or messages that Designer generated as you design a form. The Log tab lets you view the following errors and messages:

- Validation messages
- JavaScript or FormCalc scripting execution errors
- Design-time form rendering errors that are generated when you import or save a form or preview a form from the Preview PDF tab.

For more information about using the Report palette, see “[Using the workspace to debug calculations and scripts](#)” on page 10.

Providing debugging feedback using the `messageBox` method

The XML Form Object Model `messageBox` method lets you output information from an interactive form into a dialog box at run time. You can take advantage of the XML Form Object Model `messageBox` method to display messages or field values at runtime. When initiated, the `messageBox` method displays a string value in a new client application dialog box. The string value can be a text message that you create for debugging purposes or the string value of fields or expressions.

For example, consider a scenario with a simple form design that contains a single numeric field (NumericField1) and a button (Button1). In this case, the following FormCalc calculation and JavaScript script each output a message displaying some text and the value currently displayed in the numeric field. By adding either the calculation or the script to the `click` event of the button object, you can interactively display the value of the numeric field in a new dialog box by clicking the button.

FormCalc

```
xfa.host.messageBox(Concat("The value of NumericField1 is: ",  
    NumericField1), "Debugging", 3)
```

JavaScript

```
xfa.host.messageBox("The value of NumericField1 is: " +  
    NumericField1.rawValue, "Debugging", 3);
```

Important: The `messageBox` method returns an integer value representing the button that the form filler selects in the message box dialog. If you attach the `messageBox` method to the `calculate` event of a field object, and the `messagebox` method is the last line of the script, the field displays the return value of the `messageBox` method at runtime.

For more information about using the `messageBox`, see [messageBox](#)

Output information into a text field

You can output information, such as field values or messages, into a text field on your form design. For example, you can append new messages or values to the value of a text field to create a log for future reference..

JavaScript Debugging

If you use the JavaScript language for a script, you can use the `console.println("string")` function to output information to the JavaScript Console available in Acrobat Professional. Alternatively, you can use the `alert` method from the Acrobat JavaScript Object Model to debug JavaScript.

JavaScript Debugger in Acrobat Professional

The JavaScript Debugger in Acrobat Professional lets you test JavaScripts scripts. The debugger includes the JavaScript Console, where you can test portions of JavaScript code in the Preview PDF tab. The JavaScript Console provides an interactive and convenient interface for testing portions of JavaScript code and experimenting with object properties and methods. Because of its interactive nature, the JavaScript Console behaves as an editor that supports the execution of single lines or blocks of code.

To enable the JavaScript Debugger for Designer and execute code from the JavaScript Console, enable JavaScript and the JavaScript Debugger in Acrobat Professional.

Note: You can enable the JavaScript Debugger in Adobe Reader if you have Acrobat Reader DC extensions installed. To enable the JavaScript Debugger in Adobe Reader, you must get the `debugger.js` file and then edit the Microsoft Windows Registry. For more information about enabling the JavaScript Debugger in Adobe Reader, see [Developing Acrobat Applications Using JavaScript \(English only\)](#).

To enable the JavaScript Debugger for Designer

- 1 Start Designer.
- 2 Start Acrobat Professional.
- 3 In Acrobat Professional, select Edit > Preferences.
- 4 Select JavaScript from the list on the left.
- 5 Select Enable Acrobat JavaScript if it is not already selected.
- 6 Under JavaScript Debugger, select Enable JavaScript Debugger After Acrobat Is Restarted.
- 7 Select Enable Interactive Console. This option lets you evaluate code that you write in the JavaScript Console.
- 8 Select Show Console On Errors And Messages. This option ensures that if you make mistakes, the JavaScript Console displays helpful information.
- 9 Click OK to close the Preferences dialog box.
- 10 Quit Acrobat Professional.
- 11 In Designer, click the Preview PDF tab.
- 12 Press Ctrl+J to open the JavaScript Debugger.

To prevent the JavaScript Debugger from disappearing in Designer

If the JavaScript Debugger from Acrobat is active and it disappears when you click components in the Designer interface, stop the Acrobat.exe process in the Microsoft Windows Task Manager. The Acrobat.exe process continues to run after Acrobat is closed so that Acrobat is displayed faster if it is restarted. Stopping the process ends the association between the JavaScript Debugger and the Acrobat Professional session so that you can use the JavaScript Debugger in Designer.

- 1 In the Windows Task Manager, click the Processes tab.
- 2 In the Image Name column, right-click Acrobat.exe and select End Process.

Evaluating code using the JavaScript Console

There are three ways evaluate single and multiple lines of code using the JavaScript Console from Acrobat.

To evaluate a portion of a line of code

- ❖ Highlight the portion in the console window and press either Enter on the numeric keypad or Ctrl+Enter on the regular keyboard.

To evaluate a single line of code

- ❖ Place the cursor is in the appropriate line in the console window and press Enter on the numeric keypad or Ctrl+Enter on the regular keyboard.

To evaluate multiple lines of code

- ❖ Highlight those lines in the console window and press either Enter on the numeric keypad or Ctrl+Enter on the regular keyboard.

To delete content that appear in the JavaScript Console

- ❖ Click Clear in the console window.

The result of the most recently evaluated JavaScript script is displayed in the console window.

After evaluating each JavaScript script, the console window prints out undefined, which is the return value of the statement. Notice that the result of a statement is not the same as the value of an expression within the statement. The return value undefined does not mean that the value of script is undefined; it means that the return value of the JavaScript statement is undefined.

Providing debugging feedback to the JavaScript Console

If you are creating scripts using JavaScript, you can output messages to the JavaScript Console from Acrobat at runtime by using the `console.println` method included with the JavaScript Object Model from Acrobat. When initiated, the `console.println` method displays a string value in the JavaScript Console. The string value can be a text message that you create for debugging purposes or the string value of fields or expressions.

For example, consider a simple form design that contains a single numeric field (NumericField1) and a button (Button1). In this case, the following JavaScript script outputs a message displaying some text and the value currently displayed in the numeric field. By adding either the calculation or the script to the `click` event of the button object, you can interactively display the value of the numeric field in a new dialog box by clicking the button.

```
console.println("The value is: " + NumericField1.rawValue);
```

For more information about the `console.println` method and the JavaScript Object Model from Acrobat, see [Developing Acrobat Applications Using JavaScript](#) (English only).

For more information about the JavaScript Console and the JavaScript Debugger, see [Developing Acrobat Applications Using JavaScript](#)(English only).

Providing debugging feedback using the alert method

If you want to return a message box during a calculate event, you can take advantage of the `alert` method from the JavaScript Object Model from Acrobat. For example, the following script returns the value of a text field:

```
var oField = xfa.resolveNode("TextField1").rawValue;  
app.alert(oField);
```

For more information about the `alert` method and the JavaScript Object Model from Acrobat, see [Developing Acrobat Applications Using JavaScript](#) (English only).

More Help topics

[“Using the workspace to debug calculations and scripts”](#) on page 10

Debugging tips

Remember the following tips when debugging calculations and scripts.

Sample data

Remember to specify a preview data file in the Form Properties dialog box. Specifying a preview data file does not save the data into the final PDF.

Master pages

To debug master pages, drop a different object on each master page to find out which one is specified.

First page in a form

Designer looks at the root subform to determine which page to begin the form on. If the root subform does not determine the first page, the first master page is used by default.

Incremental debugging

When debugging a form design, start by removing pieces of the form until you cannot reproduce the problem. Try to isolate the source of the problem after you've reviewed every script and object property. To debug subforms, you can specify a thick colored border around the subform, or use a fill. Colors or fill can help indicate which subform is used and its span. Usually, this technique works well when you want to determine the bounds of an object and can show why it is placed in a certain location.

Hierarchy view

View your form design by using the Hierarchy view to get a better understand of it. The order of the objects that are listed in the hierarchy indicates the order they are placed on the page. Some objects are not clickable if they are below one another.

Script error messages

In Designer, script error messages appear on the Log tab of the Report palette when you preview the form. If the form design contains FormCalc scripts and the error occurs on the server, the warnings appear in the Log tab. If the FormCalc script error occurs on the client, the message appears in Adobe Reader or Acrobat.

An error in a FormCalc script prevents the entire script from executing.

An error in a JavaScript executes until it reaches the error.

Syntax errors in FormCalc

Syntax errors in FormCalc are sometimes difficult to solve. When the "Syntax error near token '%1' on line %2, column %3" appears, %1 usually contains the token (word) nearest to the error. Therefore the token is possibly correct and the error is not related to the error other than its proximity to it. For example, the following script generates the 7008 error: "Syntax error near token 'then' on line x, column y."

```
var b = abc(1)
if (b ne 1) then
//comment
```

The problem is that an `endif` token is missing from the script. The last correct token is `then` (comments do not count as tokens). Adding an `endif` statement to the end of the script fixes the problem.

Functions defined in a script object

You can only call a function that is defined in a script object with a JavaScript script. Make sure that you change the script language to JavaScript in the Script Editor. If not, you may see a message indication that Designer cannot resolve the script object. The same error can occur when a syntax issue occurs in the script object.

Web service calls

When creating web service calls, use the `postExecute` event to see what was returned and whether the web service issued any error messages.

Long SOM expressions

When typing long, multilayered SOM expression, press the Ctrl key and click the object on the canvas. The command inserts the object's SOM expression into the script. The SOM expression is relative to the object hosting the script. To insert the absolute SOM, press Ctrl+Shift and click the object. These commands work when you click objects in the Design view, not in the Hierarchy view.

Test SOM expressions

When a long SOM expression fails, start back at the root of the expression and test each dot with `className` until you reach the problem. For example, test `a.b.c.d` by starting at the root:

- `console.println(a.className)`
- `console.println(a.b.className)`
- `console.println(a.b.c.className)`
- `console.println(a.b.c.d.className)`

Use script objects to debug form designs

Use a script object, such as a fragment, to help you debug form designs:

- Dump out a node hierarchy under a node.
- Output the value of a property or attribute of a node.
- Output whether a node has a property or attribute specified.
- Output the SOM expression of a node.

- Dump out the `xml src` of a given node.

Here is an example of a script object that contains several debugging functions:

```
<script contentType="application/x-javascript" name="XFADEBUG">
//This script object provides several tracing functions to help debug a form design
//Dump out node hierarchy to console.println()
function printNode(node) {...}
//Dump out SOM expression to console.println() function printSOM(node) {...}
//Dump out property or attribute value function printValue(node, attrOrPropertyName) {...}
function printXMLSource(node) { ....}
function printHasPropertySpecified(node, prop) {...} \\
</script>
```

Things to avoid when building forms

- Calling `xfa.layout.relayout()` on the `docReady` even causes problems because the `docReady` event triggers every time the layout is ready.
- Placing a flowed container inside a positioned container causes problems with page breaks, overlapping objects, and repeating subforms. The root subform is a flowed container. Take advantage of it and place your flowable containers inside the root subform by unwrapping the page subforms after your layout is done. Alternatively, set the flow of the page subforms to flowed.
- Blank page issue (Acrobat 7.1 or earlier). At design time, a blank page is displayed when the subform does not fit within the boundaries of the content area. To fix the blank page, either resize the subform or allow it to break between pages. If a user is using Acrobat 7.1 or earlier, the second-level subform appears on a different page.

Chapter 12: Working with a Host Application

A host application is the application in which a form exists at any given time.

For example, if you are using Adobe document services to render a form in HTML format, then during the pre-rendering process the host application is Adobe document services.

Once you render a form and view it in a client application such as Acrobat, Adobe Reader, or an HTML browser, then the client application becomes the host application.

Designer includes a scripting model that provides scripting properties and methods for directly interfacing with a hosting application. For example, you can use the properties and methods in the host scripting model to provide PDF page navigation actions in Acrobat or Adobe Reader, or you can use the `importData` method to load data into your form.

You can reference the host script model syntax on any valid scripting event for form design objects using the following syntax for both FormCalc and JavaScript:

```
xfa.host.property_or_method
```

Host scripting model properties and methods

Using the host scripting model properties and methods, you can retrieve information and execute actions that are not otherwise accessible through calculations and scripts. For example, you can retrieve the name of the host application (such as Acrobat), or advance the current page on an interactive form. The following table lists the properties and methods that are available for the host scripting model.

Properties	Methods
<code>appType</code>	<code>beep</code>
<code>calculationsEnabled</code>	<code>exportData</code>
<code>currentPage</code>	<code>gotoURL</code>
<code>language</code>	<code>importData</code>
<code>name</code>	<code>messageBox</code>
<code>numPages</code>	<code>pageDown</code>
<code>platform</code>	<code>pageUp</code>
<code>title</code>	<code>print</code>
<code>validationsEnabled</code>	<code>resetData</code>
<code>variation</code>	<code>response</code>
<code>version</code>	<code>setFocus</code>

For more information about the host scripting model properties and methods, see the [Developer Center](#).

Comparing the host scripting model functionality

This table lists the Designer host scripting model properties and methods, and compares them to the equivalent expressions in the JavaScript Object Model in Acrobat.

For more information about the host scripting model properties and methods, see *Designer Help*, or see the [About the Scripting Reference](#).

Host scripting model properties and methods	JavaScript Object Model from Acrobat equivalent
<code>xfa.host.appType</code>	<code>app.viewerType</code>
<code>xfa.host.beep([INTEGER param])</code>	<code>app.beep([nType])</code>
<code>xfa.host.currentPage</code>	<code>doc.pageNum</code>
<code>xfa.host.exportData([STRING param1 [, BOOLEAN param2]])</code>	<code>doc.exportXFAData(cPath [, bXDP])</code>
<code>xfa.host.gotoURL(STRING param1)</code>	<code>doc.getURL(cURL, [bAppend])</code> or <code>app.launchURL(URL);</code>
<code>xfa.host.importData([STRING param])</code>	<code>doc.importXFAData(cPath)</code>
<code>xfa.host.language</code>	<code>app.language</code>
<code>xfa.host.messageBox(STRING param1 [, STRING param2 [, INTEGER param3 [, INTEGER param4]]])</code>	<code>app.alert(cMsg [, nIcon [, nType [, cTitle]]])</code>
<code>xfa.host.name</code>	<code>none</code>
<code>xfa.host.numPages</code>	<code>doc.numPages</code>
<code>xfa.host.pageDown()</code>	<code>doc.pageNum++</code>
<code>xfa.host.pageUp()</code>	<code>doc.pageNum--</code>
<code>xfa.host.platform</code>	<code>app.platform</code>
<code>xfa.host.print(BOOLEAN param1, INTEGER param2, INTEGER param3, BOOLEAN param4, BOOLEAN param5, BOOLEAN param6, BOOLEAN param7, BOOLEAN param8)</code>	<code>doc.print([bUI [, nStart [, nEnd [, bSilent [, bShrinkToFit [, bPrintAsImage [, bReverse [, bAnnotations]]]]]]])</code>
<code>xfa.host.resetData([STRING param])</code>	<code>doc.resetForm([aFields])</code>
<code>xfa.host.response(STRING param1 [, STRING param2 [, STRING param3 [, BOOLEAN param4]]])</code>	<code>app.response(cQuestion [, cTitle [, cDefault [, bPassword]]])</code>
<code>xfa.host.setFocus(STRING param)</code>	<code>field.setFocus()</code> (Deprecated)

Host scripting model properties and methods	JavaScript Object Model from Acrobat equivalent
xfa.host.title	doc.title
xfa.host.variation	app.viewerVariation
xfa.host.version	app.viewerVersion

More Help topics

[“Referencing Objects in Calculations and Scripts” on page 65](#)

Chapter 13: Working with the Event Model

The event model stores object event properties. These properties are useful if you want to access values that are otherwise out of the scope of the events listed in the Show list within the Script Editor.

The event model controls the changes in a form that occur before, during, and after actions take place. These actions include dynamic form events, such as the point when the data and form design are merged but before pagination is applied, and also interactive form events, such as when a user updates the value of a field.

Event model properties and methods

Using the event object properties and methods, you can retrieve information and execute actions that otherwise are not accessible through calculations and scripts. For example, you can retrieve the full value of a field that otherwise would have part of the data stripped out because it is too long or otherwise invalid. Retrieving the full value of a field is useful in situations where you have to do extensive error checking.

Properties	Methods
change	emit
className	reset
commitKey	
fullText	
keyDown	
modifier	
name	
newContentType	
newText	
prevContentType	
prevText	
reenter	
selEnd	
selStart	
shift	
soapFaultCode	
soapFaultString	
target	

For more information about the event scripting model properties and methods, see the [Developer Center](#).

Chapter 14: Moving from Scripting in Acrobat to Designer

Designer includes extensive scripting capabilities, including support for the most common JavaScript objects from Acrobat. When you convert an Acrobat form to Designer, most JavaScript scripts continue to work without requiring changes. However, you will need to manually convert some JavaScript scripts from Acrobat to maintain the behavior of your Acrobat form.

When converting scripts on your Acrobat form, note that Designer scripting differs from scripting in Acrobat in several ways:

Designer workspace In the Designer workspace, you can change object properties and behaviors on your form without requiring you to create scripts.

Scripting languages Designer includes support for JavaScript as well as for FormCalc, which is a simple calculation language. FormCalc includes built-in functions that perform many useful operations that would otherwise require extensive scripting.

Referencing objects, properties, and methods Designer forms are highly structured; therefore, to reference specific objects, properties, or methods, you must include the appropriate reference syntax in your script. You can use the statement completion options in the Script Editor to assist you in creating reference syntaxes.

It is possible to continue to use JavaScript objects, properties, and methods from Acrobat in Designer. However, you should consider JavaScript from Acrobat only for tasks that you cannot perform using the XML Form Object Model in Designer. For example, you can use JavaScript from Acrobat to add attachments, bookmarks, and annotations; search or spell check the form; create reports; or access and manipulate metadata. You cannot use JavaScript from Acrobat to perform actions such as setting field values, adding new fields to a form, or deleting pages from a form.

Note: *You cannot use Acrobat to add JavaScript scripts to a Designer form, including Acrobat forms that you have converted using Designer. When you view a Designer form in Acrobat, all JavaScript tools are unavailable.*

For more information about converting Acrobat scripting to Designer, see the article [Converting Acrobat JavaScript for Use in Designer Forms](#) in the Developer Center.

Converting Acrobat forms that contain scripts

One of the first steps in converting a form from Acrobat to Designer is to determine how much of the Acrobat scripting is supported by Designer and how much you must convert.

In general, you should convert all Acrobat scripting to an equivalent in Designer. Designer scripting takes full advantage of the highly structured nature of Designer forms, as well as useful forms-specific functionality, to make designing and implementing your forms solution faster and easier.

The Acrobat scripting you should retain include those that deal with the form's environment and peripheral operations, such as adding attachments or multimedia, performing searches, or creating reports and handling document metadata.

For more information about converting Acrobat scripting to Designer, see the article [Converting Acrobat JavaScript for Use in Designer Forms](#) in the Developer Center.

More Help topics

- “[Moving from Scripting in Acrobat to Designer](#)” on page 90
- “[Using JavaScript objects from Acrobat in Designer](#)” on page 91
- “[JavaScript objects from Acrobat supported in Designer](#)” on page 92

Using JavaScript objects from Acrobat in Designer

In Designer, you can script against certain JavaScript objects in Acrobat by using the Acrobat scripting syntax. As a result, you can use the properties and methods of those objects on your form. For example, to display a message in the JavaScript Console from Acrobat, you can add the following script to the event of a form design object in Designer:

```
console.println("This message appears in the JavaScript Console.");
```

You can also have the form send itself by email by adding the following script to the `click` event of a button:

```
var myDoc = event.target;  
myDoc.mailDoc(true);
```

Note: In Designer, you must ensure that the scripting language for the event is set to JavaScript so that the script will execute correctly at run time.

You can also use references to the JavaScript objects in Acrobat in your reference syntax. For example, the following script gets the signed state of a signature field and takes an action based on the state:

```
// Proceed if the current field is not signed.  
var oState =  
    event.target.getField("form1[0].#subform[0].SignatureField1[0]")  
    .signatureValidate(); //Get the field's signed state.  
  
if (oState == 0) {  
    ...  
}
```

Note: This example uses a fully qualified reference syntax to reference the text. For more information about referencing form design objects, see “[Referencing object properties and values](#)” on page 65.

When working with JavaScript from Acrobat in Designer, remember these points:

- In Designer, use `event.target` to access the `Doc` JavaScript object from Acrobat. In Acrobat, the `this` object is used to reference the `Doc` object; however, in Designer, the `this` object refers to the form design object to which the script is attached.
- The Script Editor has no statement completion for JavaScript objects from Acrobat. See the [JavaScript for Acrobat API Reference](#).
- The `Doc` method `event.target.importTextData("file.txt")` is not supported for dynamic XFA forms that have been certified.

For more information about converting Acrobat scripting to Designer, see the article [Converting Acrobat JavaScript for Use in Designer Forms](#) in the Developer Center.

More Help topics

- “Moving from Scripting in Acrobat to Designer” on page 90
“Converting Acrobat forms that contain scripts” on page 90
“JavaScript objects from Acrobat supported in Designer” on page 92

JavaScript objects from Acrobat supported in Designer

The following table lists the availability of the most commonly used Acrobat objects, properties, and methods in Designer, and provides information on any equivalent functionality in Designer. Although the table contains the most commonly used Acrobat objects, properties and methods, some are not listed, such as multimedia objects, because they are rarely used for forms.

In cases where no equivalent Designer functionality is listed, no direct Designer property or method can reproduce the Acrobat behavior. However, you can still create custom functions or scripts to replicate the Acrobat capability.

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
Annot object properties and methods			
All properties and methods	Yes	None	Only forms with a fixed layout support the annotation layer.
app object properties			
calculate	No	None	Designer includes the <code>execCalculate</code> method which initiates the <code>calculate</code> event. execCalculate
language	Yes	<code>xfa.host.language</code>	See the <code>language</code> property. language
monitors	Yes	None	
platform	Yes	<code>xfa.host.platform</code>	See the <code>platform</code> property. platform
plugins	Yes	None	
toolbar	Yes	None	
viewerType	Yes	<code>xfa.host.appType</code>	See the <code>appType</code> property. appType
viewerVariation	Yes	<code>xfa.host.variation</code>	See the <code>variation</code> property. variation
viewerVersion	Yes	<code>xfa.host.version</code>	See the <code>version</code> property. version
app object methods			
addMenuItem	Yes	None	
addSubMenu	Yes	None	

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
addToolButton	Yes	None	
alert	Yes	xfa.host.messageBox()	See the messageBox method. messageBox
beep	Yes	xfa.host.beep()	See the beep method. beep
browseForDoc	Yes	None	
clearInterval	Yes	None	
clearTimeOut	Yes	None	
execDialog	Yes	None	
execMenuItem	Yes	None	Executes the specified menu command. Use this method in Designer for File menu commands.
getNthPluginName	Yes	None	
getPath	Yes	None	
goBack	Yes	None	
goForward	Yes	None	
hideMenuItem	Yes	None	
hideToolbarButton	Yes	None	
launchURL	Yes	None	Designer includes the gotoURL method that loads a specified URL into the client application, such as Acrobat or Adobe Reader. gotoURL
listMenuItems	Yes	None	
listToolbarButtons	Yes	None	
mailGetAddrs	Yes	None	
mailMsg	Yes	None	
newDoc	Yes	None	This method can only be executed during batch, console, or menu events.
newFDF	No	None	
openDoc	Yes	None	
openFDF	No	None	
popUpMenuEx	Yes	None	
popUpMenu	Yes	None	
removeToolButton	Yes	None	

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
response	Yes	xfa.host.response()	See the response method . response
setInterval	Yes	None	
setTimeOut	Yes	None	
trustedFunction	Yes	None	
trustPropagatorFunction	Yes	None	This method is only available during batch, console, and application initialization.
Bookmark object properties and methods			
All properties and methods	Yes	None	
doc object properties			
author	Yes	None	
baseURL	Yes	None	
bookmarkRoot	Yes	None	
calculate	No	None	
dataObjects	Yes	None	
delay	No	None	
dirty	Yes	None	This JavaScript script for Designer saves a copy of a form and tests whether the form has changed: var sOrigXML = xfa.data.saveXML; if (sOrigXML != xfa.data.saveXML) {...}
disclosed	Yes	None	
documentFileName	Yes	None	
dynamicXFAForm	Yes	None	
external	Yes	None	
filesize	Yes	None	
hidden	Yes	None	
icons	Yes	None	
keywords	Yes	None	
layout	Yes	None	
media	Yes	None	
metadata	Yes	xfa.form.desc	See the desc object . desc
modDate	Yes	None	

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
mouseX mouseY	Yes	None	
noautocomplete	Yes	None	
nocache	Yes	None	
numFields	Yes	xfa.layout.pageContent() or xfa.layout.absPageCount() xfa.layout.pageCount()	The <code>pageContent</code> method returns a list of all objects of a particular type. However, you must execute the method for design views and master pages to scan the entire form. pageContent
numPages	Yes	xfa.host.numPages or xfa.layout.absPageCount() xfa.layout.pageCount()	The <code>numPages</code> property returns the page count for the rendered form in the client. See also the <code>absPageCount</code> and <code>pageCount</code> methods. numPages absPageCount pageCount
pageNum	Yes	xfa.host.currentPage	See the <code>currentPage</code> property. currentPage
pageNum--	Yes	xfa.host.currentPage-- or xfa.host.pageUp()	See the <code>currentPage</code> property or the <code>pageUp</code> method. currentPage pageUp
pageNum++	Yes	xfa.host.currentPage++ or xfa.host.pageDown()	See the <code>currentPage</code> property or the <code>pageDown</code> method. currentPage pageDown
path	Yes	None	
securityHandler	Yes	None	
templates	No	None	Use subform objects in Designer, and use properties and methods to add, remove, move, and set subform instances. Add and remove subform instances using scripting
title	Yes	xfa.host.title	See <code>title</code> .
doc object methods			
addAnnot	Yes	None	

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
addField	No	None	You must use forms that have a fixed layout in Designer, and then use the <code>instanceManager</code> object to add, remove, and set the number of instances of a particular object. instanceManager For more information, see Add and remove subform instances using scripting .
addIcon	Yes	None	
addLink	No	None	
addRecipientListCryptFilter	Yes	None	
addScript	Yes	None	
addThumbnails	No	None	
addWatermarkFromFile	Yes	None	
addWatermarkFromText	Yes	None	
addWeblinks	Yes	None	
appRightsSign	Yes	None	
appRightsValidate	Yes	None	
bringToFront	Yes	None	
calculateNow	No	<code>xfa.form.recalculate(1)</code> ; or <code>execCalculate()</code>	recalculate The <code>recalculate</code> method forces a specific set of scripts on calculate events to initiate. Boolean value indicates whether True (default) - all calculation scripts initiate; or False - only pending calculation scripts initiate. Designer <code>calculate</code> object controls whether a form filler can override a field's calculated value. execCalculate Alternatively, you can use the <code>execCalculate</code> method for each object for which you want to force a recalculation.
closeDoc	Yes	None	
createDataObject	Yes	None	
createTemplate	No	None	Designer forms do not have an equivalent to the concept of an Acrobat template. You must use subform objects in Designer.

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
deletePages	No	None	<p>instanceManager</p> <p>In Designer, you can use the <code>instanceManager</code> object to remove the subform object that represents a page of your form.</p> <p>For more information, see Add and remove subform instances using scripting.</p>
embedDocAsDataObject	Yes	None	
encryptForRecipients	Yes	None	
encryptUsingPolicy	Yes	None	
exportAsText	Yes	None	This method is only available in the JavaScript Console of the JavaScript Debugger in Acrobat or during batch processing.
exportAsFDF	No	<code>xfa.host.exportData()</code>	<p>exportData</p> <p>The <code>exportData</code> method exports an XML or XDP file instead of an FDF file.</p>
exportAsXFDF	No	<code>xfa.host.exportData()</code>	<p>exportData</p> <p>The <code>exportData</code> method exports an XML or XDP file instead of an FDF file.</p>
exportDataObject	Yes	None	
exportXFAData	No	<code>xfa.host.exportData()</code>	<p>exportData</p> <p>The <code>exportData</code> method exports an XML or XDP file instead of an FDF file.</p>
extractPages	No	None	
flattenPages	No	None	
getAnnot	Yes	None	
getAnnots	Yes	None	
getDataObjectContents	Yes	None	
getField("FieldName")	Yes	<code>xfa.resolveNode("FieldName")</code>	<p>resolveNode</p> <p>The <code>resolveNode</code> method accesses the specified object in the source XML of the form.</p>
getLegalWarnings	Yes	None	
getLinks	No	None	
getNthFieldName	Yes	You must loop through all objects with a similar class name until you reach the nth occurrence.	<p>className</p> <p>See the <code>className</code> property.</p>

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
getNthTemplate	No	None	
getOCGs	Yes	None	
getOCGOrder	Yes	None	
getPageBox	Yes	None	
getPageLabel	Yes	None	
getPageNthWord	Yes	None	
getPageNthWordQuads	Yes	None	
getPageNumWords	Yes	None	
getPageRotation	Yes	None	
getPrintParams	Yes	None	
getTemplate	No	None	
getURL	Yes	xfa.host.gotoURL("http://www.adobe.com");	See the gotoURL method. gotoURL
gotoNamedDest	No	None	
importAnFDF	No	None	
importAnXFDF	Yes	None	
importDataObject	Yes	None	
importIcon	Yes	None	
importTextData	Yes	None	
importXFAData	No	xfa.host.importData ("filename.xdp");	See the importData method. importData
insertPages	No	None	
mailDoc	Yes	None	
mailForm	No	None	
movePage	No	None	
newPage	No	None	
openDataObject	Yes	None	
print	Yes	xfa.host.print();	See the print method. print
removeDataObject	Yes	None	
removeField	No	None	
removeIcon	Yes	None	

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
removeLinks	No	None	
removeScript	Yes	None	
removeTemplate	No	None	
removeThumbnails	No	None	
removeWeblinks	Yes	None	
replacePages	No	None	
resetForm	No	xfa.host.resetData() or xfa.event.reset()	The <code>resetData</code> method resets all field values on a form to the default values. The <code>reset</code> method resets all properties within the event model. resetData reset
saveAs	Yes	None	In Designer, the file must be saved at the application level. These scripts are examples of saving at the application level: <code>app.executeMenuItem("SaveAs");</code> or <code>var myDoc = event.target; myDoc.saveAs();</code>
spawnPageFromTemplate	No	None	
setAction	No	None	
setLabel	Yes	None	
setPageRotation	No	None	
setPageTabOrder	No	None	In Designer, select Edit > Tab Order to set the tab order.
setScript	No	None	
submitForm	Yes	Use one of the submit button objects in Designer.	
event object properties			
change	Yes	xfa.event.change	change See the <code>change</code> property.
targetName	Yes	xfa.event.target	target See the <code>target</code> property.
field object properties			
comb	No	None	

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
charLimit	No	this.value.#text.maxChars	In forms that have a fixed layout, character limit can be set in the Designer workspace. You can set fields on forms whose layout expands to accommodate all data. <code>maxChars</code>
display = display.noView	No	See " Changing the presence of a form design object " on page 123.	<code>presence</code> You can also set the <code>presence</code> property in the Designer workspace. You cannot use the <code>prePrint</code> event to change the presence of an object prior to printing.
display = display.noPrint	No	See " Changing the presence of a form design object " on page 123.	<code>presence</code> You can also set the <code>presence</code> property in the Designer workspace. You cannot use the <code>prePrint</code> event to change the presence of an object prior to printing.
defaultValue	No	None	Set the default field value in the Designer workspace.
exportValues	No	None	Set the export value in the Designer workspace.
fillColor	No	xfa.form.Form1.NumericField1.fillColor	<code>fillColor</code> See the <code>fillColor</code> property.
hidden	No	this.presence = "invisible"; this.presence = "visible"	<code>presence</code> You can also set the <code>presence</code> property in the Designer workspace.
multiline	No	this.ui.textEdit.multiLine = "1";	<code>multiLine</code> See the <code>multiLine</code> property.
password	No	None	Designer contains a Password Field that you can use for passwords on a form.
page	No	None	Not applicable for Designer forms.
print	No	this.relevant = "-print";	<code>relevant</code> See the <code>relevant</code> property.
radiosInUnison	No	None	Grouped radio buttons in Designer are mutually exclusive by default.

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
rect	Yes	<p>You can get the height and width of a Designer form field by using the following reference syntax:</p> <pre>this.h; this.w;</pre> <p>Alternatively, you can retrieve the x and y coordinates of an object using the following reference syntax:</p> <pre>this.x; this.y;</pre>	h, x, y See the h, w, x, and y properties.
required	No	<pre>this.mandatory = "error"; or this.validate.nullTest = "error";</pre>	mandatory, nullTest See the mandatory and nullTest properties.
textColor	No	this.font.color	fontColor See the fontColor property.
textSize	No	this.font.size	size See the size property.
textFont	No	this.font.typeface	typeface See the typeface property.
value	No	this.rawValue	rawValue See the rawValue property. value Designer fields have a value property; it is not the equivalent of the Acrobat value property.
field object methods			
clearItems	No	DropDownList1.clearItems();	clearItems The clearItems method only applies to Drop-down List and List Box objects in Designer.
deleteItemAt	No	None	
getItemAt	No	None	
insertItemAt	No	DropDownList1.addItem.....)	addItem See the addItem method.
isBoxChecked	No	if (CheckBox1.rawValue == 1)....	rawValue See the rawValue property.
isDefaultChecked	No	None	
setAction	No	None	Not applicable for Designer forms.

JavaScript in Acrobat	Designer support	JavaScript-equivalent in Designer	Comments
setFocus	Yes	xfa.host.setFocus ("TextField1.somExpression")	setFocus The <code>setFocus</code> method requires that the specified object have a unique name with respect to other objects on your form.
setItems	No	None	
setLock	Yes	None	
signatureGetModifications	Yes	None	
signatureGetSeedValue	Yes	None	
signatureInfo	Yes	None	
signatureSetSeedValue	Yes	None	
signatureSign	Yes	None	
signatureValidate	Yes	None	
search object method			
search.query("<your text>");	Yes	None	The ".." (double period) FormCalc shortcut syntax allows you to search for objects within the XML Form Object Model. For more information, see "FormCalc reference syntax shortcuts" on page 69.
SOAP object method			
All properties and methods	Yes	None	

More Help topics

[“Working with the Event Model” on page 89](#)

Chapter 15: Examples of Common Scripting Tasks

The scripting examples demonstrate quick and simple techniques that you can apply to your own work.

For more examples and ideas, visit the [Developer Center](#).

Changing the background colors of fields, fillable areas, and subforms

This example demonstrates how to change the background color of subforms, fields, and fillable areas on a form in response to form filler interaction at run time.

In this example, clicking a button changes the background color of an associated object.

Name:

Address: City: State:

Country: Zip Code:

Buttons: Subform, Fields, Fillable Areas, Clear all

Name:

Address: City: State:

Country: Zip Code:

Name:

Address: City: State:

Country: Zip Code:

Name:

Address: City: State:

Country: Zip Code:

Note: To manipulate the background color of objects at run time, you must save your form as an Acrobat Dynamic XML Form file.

To see this scripting example and others, visit the [Developer Center](#).

Scripting the subform and text field background colors

You set the subform and the text field background colors by using the `fillColor` method. For example, the following line is the script for the subform:

```
Subform1.fillColor = "17,136,255";
```

The following lines make up the script for the background color of the text fields:

```
Subform1.Name.fillColor = "102,179,255";
Subform1.Address.fillColor = "102,179,255";
Subform1.City.fillColor = "102,179,255";
Subform1.State.fillColor = "102,179,255";
Subform1.ZipCode.fillColor = "102,179,255";
Subform1.Country.fillColor = "102,179,255";
```

Scripting the fillable area background color

When setting the background color or the fillable area for each text field, your scripts must access properties that require a reference syntax expression that includes the number sign (#). Because JavaScript does not interpret the number sign (#) properly in reference syntax expressions, the script uses the `resolveNode` method to resolve the expression.

```
xfa.resolveNode("Subform1.Name.ui.#textEdit.border.fill.color").value = "153,204,255";
xfa.resolveNode("Subform1.Address.ui.#textEdit.border.fill.color").value = "153,204,255";
xfa.resolveNode("Subform1.City.ui.#textEdit.border.fill.color").value = "153,204,255";
xfa.resolveNode("Subform1.State.ui.#textEdit.border.fill.color").value = "153,204,255";
xfa.resolveNode("Subform1.ZipCode.ui.#textEdit.border.fill.color").value = "153,204,255";
xfa.resolveNode("Subform1.Country.ui.#textEdit.border.fill.color").value = "153,204,255";
```

Scripting the Clear All button

The script for the Clear All button uses the `remerge` method to remerge the form design and form data. In this case, the method effectively restores the fields, fillable areas, and subforms to their original state.

```
xfa.form.remerge();
```

Hiding and showing objects

This example demonstrates how to hide buttons when printing a form, as well as how to hide and show objects by changing the presence values at run time.

Note: You can also use the Action Builder dialog box on the Tools menu to hide and show objects in forms that have a flowable layout, without writing scripts. For information, see [Building actions in forms](#)

In this example, all form objects are showing in the form.

Form Objects

Name:	Jim Stall
Address:	84 Brownstone St.
City:	Sunnydale
State:	
Zip Code:	
Country:	
<input type="button" value="Submit"/>	
<input type="button" value="Submit by Email"/>	
<input type="button" value="Print Form"/>	

Presence Values

Subform:	Values:
Subform1	Visible
Text Fields:	Values:
	Visible
Buttons:	Values:
	Visible
<input type="button" value="Reset"/>	

The form filler can use the drop-down lists in the Presence Values area to show or hide objects. In the following diagram, the Address field is hidden and the form layout has adjusted accordingly. The Print Form button is also invisible.

Form Objects

A screenshot of a form titled "Form Objects". It contains five text input fields: "Name" (value: Jim Stall), "City" (value: Sunnydale), "State" (empty), "Zip Code" (empty), and "Country" (empty). Below the fields are two buttons: "Submit" and "Submit by Email".

Presence Values

A screenshot of the "Presence Values" dialog box. It contains three sections: "Subform" (Subform1, Visible), "Text Fields" (Address, Hidden (Exclude from Layout)), and "Buttons" (Print Form, Invisible). A "Reset" button is at the bottom.

Subform:	Values:
Subform1	Visible

Text Fields:	Values:
Address	Hidden (Exclude from Layout)

Buttons:	Values:
Print Form	Invisible

Reset

Note: To hide and show objects at run time, you must save your form as an Acrobat Dynamic PDF Form file.

To see this scripting example and others, visit the [Developer Center](#).

Scripting the presence values for subforms

The script for the subform presence values uses a switch statement to handle the three presence options that a form filler can apply to the subform object:

```
switch(xfa.event.newText) {  
    case 'Invisible':  
        Subform1.presence = "invisible";  
        break;  
    case 'Hidden (Exclude from Layout)':  
        Subform1.presence = "hidden";  
        break;  
    default:  
        Subform1.presence = "visible";  
        break;  
}
```

Scripting the presence values for text fields

The script for the text fields presence values requires two variables. The first variable stores the number of objects contained in Subform1:

```
var nSubLength = Subform1.nodes.length;
```

The second variable stores the name of the text field that the form filler selects in the Text Fields drop-down list:

```
var sSelectField = fieldList.rawValue;
```

The following script uses the `replace` method to remove all of the spaces from the name of the field stored in the `sSelectField` variable, which allows the value of the drop-down list to match the name of the object in the Hierarchy palette:

```
sSelectField = sSelectField.replace(' ', '');
```

This script uses a `For` loop to cycle through all of the objects contained in Subform1:

```
for (var nCount = 0; nCount < nSubLength; nCount++) {
```

If the current object in Subform1 is of type `field` and the current object has the same name as the object that the form filler selected, the following switch cases are performed:

```
if ((Subform1.nodes.item(nCount).className == "field") &  
(Subform1.nodes.item(nCount).name == sSelectField)) {
```

The following script uses a switch statement to handle the three presence values that a form filler can apply to text field objects:

```
switch(xfa.event.newText) {  
    case 'Invisible':  
        Subform1.nodes.item(nCount).presence = "invisible";  
        break;  
    case 'Hidden (Exclude from Layout)':  
        Subform1.nodes.item(nCount).presence = "hidden";  
        break;  
    default:  
        Subform1.nodes.item(nCount).presence = "visible";  
        break;  
}
```

Scripting the presence values for buttons

The script for the buttons presence values requires two variables. This variable stores the number of objects contained in Subform1:

```
var nSubLength = Subform1.nodes.length;
```

This variable stores the name of the button that the form filler selects in the Buttons drop-down list:

```
var sSelectButton = buttonList.rawValue;
```

The following script uses the `replace` method to remove all of the spaces from the name of the button stored in the `sSelectField` variable, which allows the value of the drop-down list to match the name of the object in the Hierarchy palette:

```
sSelectButton = sSelectButton.replace(/\s/g, '');
```

This script uses a `For` loop to cycle through all of the objects contained in Subform1:

```
for (var nCount = 0; nCount < nSubLength; nCount++) {
```

If the current object in Subform1 is of type `field` and the current object has the same name as the object that the form filler selected, perform the following switch cases:

```
if ((Subform1.nodes.item(nCount).className == "field") &
    Subform1.nodes.item(nCount).name == sSelectButton) {
```

This script uses a `switch` statement to handle the five presence values that a form filler can apply to button objects.

Note: The `relevant` property indicates whether an object should appear when the form is printed.

```
switch(xfa.event.newText) {
    case 'Invisible':
        Subform1.nodes.item(nCount).presence = "invisible";
        break;
    case 'Hidden (Exclude from Layout)':
        Subform1.nodes.item(nCount).presence = "hidden";
        break;
    case 'Visible (but Don\'t Print)':
        Subform1.nodes.item(nCount).presence = "visible";
        Subform1.nodes.item(nCount).relevant = "-print";
        break;
    case 'Invisible (but Print Anyway)':
        Subform1.nodes.item(nCount).presence = "invisible";
        Subform1.nodes.item(nCount).relevant = "+print";
        break;
    default:
        Subform1.nodes.item(nCount).presence = "visible";
        break;
}
```

Scripting for resetting the drop-down lists

Use the `resetData` method to reset all of the drop-down lists to their default values:

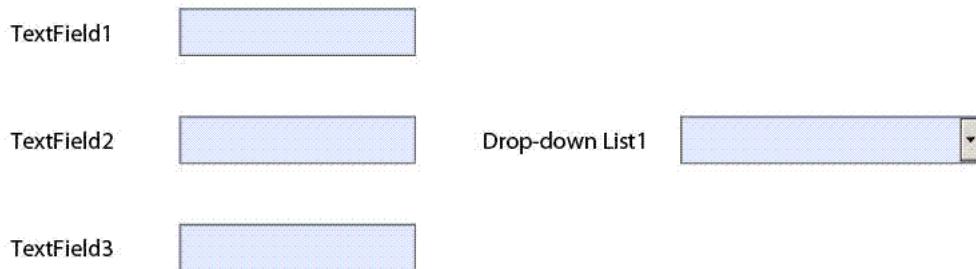
```
xfa.host.resetData();
```

Use the `remerge` method to remerge the form design and form data. In this case, the method effectively returns the objects in the Form Objects area to their original states:

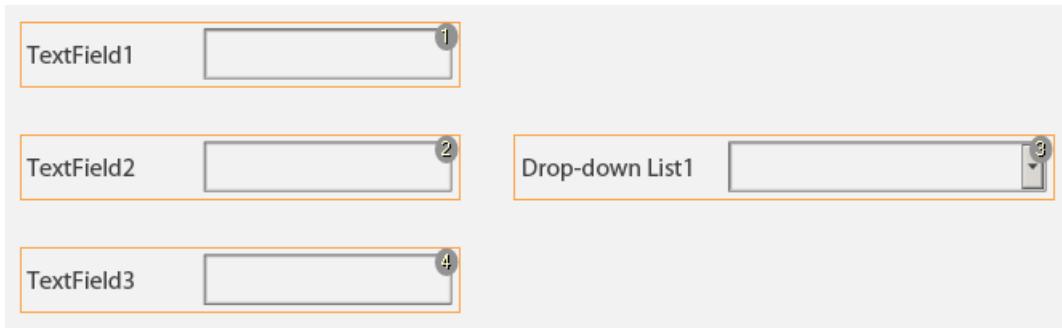
```
xfa.form.remerge();
```

Excluding an object from the tabbing order

This example demonstrates how to exclude an object from the default tabbing sequence. In this example, a user would begin in TextField1 and use the Tab button to navigate to TextField2 and then to TextField3. However, the drop-down list object, DropDownList1, is configured to display when the user's cursor enters TextField2.



In this case, by default, the user's experience would be to move sequentially in the following order:



To exclude DropDownList1 from the tabbing sequence, you would add the following scripts to the TextField2 object:

Event	Script
enter	<pre>// This conditional statement displays DropDownList3 to the user // and sets the focus of the client application to TextField2. if (DropDownList3.presence != "visible") { DropDownList3.presence = "visible"; xfa.host.setFocus(this); }</pre>
exit	<pre>// This conditional statement tests to see if the user is // pressing the Shift key while pressing the Tab key. If Shift is // held down, then the client application focus returns to // TextField1, otherwise the focus is set to TextField3. The // experience for the user is that DropDownList3 is not a // part of the tabbing order. var isShiftDown = xfa.event.shift; if (isShiftDown) { xfa.host.setFocus(TextField1); } else { xfa.host.setFocus(textField3); }</pre>

Changing the visual properties of an object on the client

The example demonstrates how to manipulate the visual properties of an object; in this case, a text field. For example, selecting the Make the Field Wider check box expands the fillable area of the text field to four inches.

Instructions
To view a change in a particular object property, select the check boxes below. To remove any effects applied, either deselect the check boxes or click the Clear All button.

Caption:

Manipulating the object:	Modifying the text field value:	Other:
<input type="checkbox"/> Move the field	<input type="checkbox"/> Change the font of the value	<input type="checkbox"/> Change the caption text
<input checked="" type="checkbox"/> Make the field wider	<input type="checkbox"/> Change the size of the font	<input type="checkbox"/> Change field border from 3D to solid
<input type="checkbox"/> Make the field taller	<input type="checkbox"/> Align text field value vertically	
<input type="checkbox"/> Change the border color of the object	<input type="checkbox"/> Align text field value horizontally	
<input type="checkbox"/> Change the fill color of the fillable area	<input type="checkbox"/> Display a set value	
<input type="checkbox"/> Expand to fit the width of the value		
<input type="checkbox"/> Make the field disappear		

Clear all

Note: To alter the visual properties of objects on the client, you must save your form as an Acrobat Dynamic PDF Form file.

In this example, the check boxes do not have unique object names; therefore, Designer assigns an instance value to reference the object. The check box script uses an `if-else` statement to give the effect of selecting and deselecting.

To see this scripting example and others, visit the [Developer Center](#).

Scripting for the Move the Field check box

When the check box is selected, the field is moved according to the x and y settings. When the check box is deselected, the field is returned to its original location.

```
if (CheckBox1.rawValue == true) {  
    TextField.x = "3.0in";  
    TextField.y = "3.5in";  
}  
else {  
    TextField.x = "1in";  
    TextField.y = "3in";  
}
```

Scripting for the Make the Field Wider check box

When the check box is selected, the field changes to 4 inches. When the check box is deselected, the field width changes to 2.5 inches.

```
if (CheckBox2.rawValue == true)
    TextField.w = "4in";
else
    TextField.w = "2.5in";
```

Scripting for the Make the Field Taller check box

When the check box is selected, the field height changes to 1.5 inches. When the check box is deselected, the field height changes to .5 inches.

```
if (CheckBox3.rawValue == true)
    TextField.h = "1.5in";
else
    TextField.h = "0.5in";
```

Scripting for the Change the Border Color of the Object check box

When the check box is selected, the field border changes to red. When the check box is deselected, the field border changes to white.

```
if (CheckBox4.rawValue == true)
    TextField.border.edge.color.value = "255,0,0";
else
    TextField.border.edge.color.value = "255,255,255";
```

Scripting for the Change the Fill Color of the Fillable Area check box

When the check box is selected, the fillable area of the text field changes to green. When the check box is deselected, the fillable area of the text field changes to white.

```
if (CheckBox5.rawValue == true) {
    xfa.resolveNode("TextField.ui.#textEdit.border.fill.color").value = "0,255,0";
}
else {
    xfa.resolveNode("TextField.ui.#textEdit.border.fill.color").value = "255,255,255";
}
```

Scripting for the Expand to Fit the Width of the Value check box

When the check box is selected, the fillable area of the text field adjusts to accommodate the value. When the check box is deselected, the fillable area of the text field does not adjust.

```
if (CheckBox6.rawValue == true)
    TextField.minW = "0.25in";
else
    TextField.maxW = "2.5in";
```

Scripting for the Make the Field Disappear check box

When the check box is selected, the field is hidden. When the check box is deselected, the field is visible.

```
if (CheckBox7.rawValue == true)
    TextField.presence = "hidden";
else
    TextField.presence = "visible";
```

Scripting for the Change the Font of the Value check box

When the check box is selected, the font of the value changes to Courier New. When the check box is deselected, the font of the value changes to Myriad Pro.

```
if (CheckBox8.rawValue == true)
    TextField.font.typeface = "Courier New";
else
    TextField.font.typeface = "Myriad Pro";
```

Scripting for the Change the Size of the Font check box

When the check box is selected, the font size changes to 14 pt. When the check box is deselected, the font size changes to 10 pt.

```
if (CheckBox9.rawValue == true)
    TextField.font.size = "14pt";
else
    TextField.font.size = "10pt";
```

Scripting for the Align Text Field Value Vertically check box

When the check box is selected, the text field value is aligned to the top. When the check box is deselected, the text field value is aligned to the middle.

```
if (CheckBox10.rawValue == true)
    TextField.para.vAlign = "top";
else
    TextField.para.vAlign = "middle";
```

Scripting for the Align Text Field Value Horizontally check box

When the check box is selected, the text field value is aligned to the center. When the check box is deselected, the text field value is aligned to the left.

```
if (CheckBox11.rawValue == true)
    TextField.para.hAlign = "center";
else
    TextField.para.hAlign = "left";
```

Scripting for the Display a Set Value check box

When the check box is selected, the value that is defined by using a script appears in the text field. When the check box is deselected, the default value (which is also defined by using a script) appears in the text field.

```
if (CheckBox12.rawValue == true)
    TextField.rawValue = "This is a value set using a script.";
else
    TextField.rawValue = "This is a default value.;"
```

Scripting for the Change the Caption Text check box

When the check box is selected, the alternate caption text that is defined by using a script appears as the caption. When the check box is deselected, the default caption (which is also defined by using a script) appears in the text field.

```
if (CheckBox13.rawValue == true)
    xfa.resolveNode("TextField.caption.value.#text").value = "Alternate Caption:";
else
    xfa.resolveNode("TextField.caption.value.#text").value = "Caption:";
```

Scripting for the Change Field Border from 3D to Solid check box

When the check box is selected, the field border changes to a solid box. When the check box is deselected, the field border changes to 3D.

```
if (CheckBox14.rawValue == true)
    xfa.resolveNode("TextField.ui.#textEdit.border.edge").stroke = "solid";
else
    xfa.resolveNode("TextField.ui.#textEdit.border.edge").stroke = "lowered";
```

Scripting for the Clear All Check Boxes button

Use the `resetData` method to reset all of the check boxes to their default value (Off).

```
xfa.host.resetData();
```

Use the `remerge` method to remerge the form design and form data. In this case, the method effectively returns the text field to its original state.

```
xfa.form.remerge();
```

Getting the current or previous value of a drop-down list

This example demonstrates how to obtain the current value of a drop-down list as well as the different ways to access the previous value of a drop-down list on a form. In addition to the actual scripts that set the current and previous values, it is important to note that the scripts are located on the `change` event for the drop-down list.

In the following example, when a form filler selects a value from the drop-down list, the selected value appears in the Current Value field. Then, when the form filler selects another value from the drop-down list, the new value appears in the Current Value List and the previous value appears in the Previous Value 1 field.

The form interface displays the following state:

- Drop-down List:** Apple
- Current Value:** Apple
- Previous Value 1:** Orange
- Previous Value 2:** Orange

Note: Each of the methods for obtaining the previous value of a drop-down list uses a different script. The Previous Value 1 text field is populated by a direct reference to the `rawValue` property of the drop-down list, whereas the Previous Value 2 text field is populated using the `prevText` property. For consistent results, it is recommended that you access the previous value by using the `prevText` property.

To see this scripting example and others, visit the [Developer Center](#).

Scripting for populating the Current Value text field

Populate the value of the Current Value text field by using the `newText` property:

```
CurrentValue.rawValue = xfa.event.newText;
```

Scripting for populating the Previous Value 1 text field

Populate the value of the Previous Value 1 text field by referencing the `rawValue` of the drop-down list:

```
PreviousValue1.rawValue = DropDownList.rawValue;
```

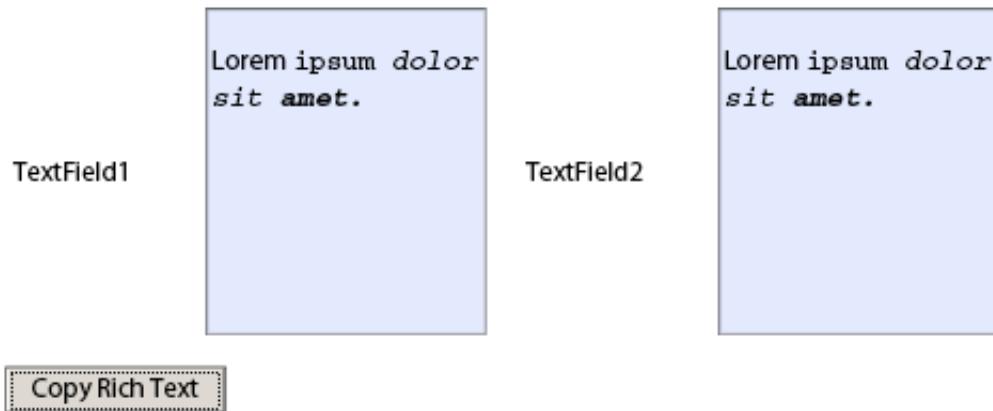
Scripting for populating the Previous Value 2 text field

Populate the value of the Previous Value 2 text field by using the `prevText` property:

```
PreviousValue2.rawValue = xfa.event.prevText;
```

Preserving rich text formatting when copying field values

This example demonstrates how to maintain rich text formatting of field data when copying values between fields.



TextField1 and TextField2 are configured to Allow Multiple Lines and display rich text formatting.

The Copy Rich Text button copies the value of TextField1, including rich text formatting, and pastes it in TextField2.

Scripting for the Copy Rich Text button

Rich text field values are stored in XML format within a child object of the field that contains the value. The following script, located on the click event of the Copy Rich Text button, uses the saveXML method to store the XML definition of the rich text value. Subsequently, the XML data is loaded into the corresponding child object of TextField2.

```
var richText = TextField1.value.exData.saveXML();
TextField2.value.exData.loadXML(richText,1,1);
```

In this example, the rich text value is set to overwrite the existing value of TextField2. Adjusting the script to the following would append the rich text data to the current value of TextField2:

```
var richText = TextField1.value.exData.saveXML();
TextField2.value.exData.loadXML(richText,1,0);
```

Adjusting the height of a field at run time

The example demonstrates how to expand a field to match the height of the content in another field.

In this example, when the form filler types multiple lines in TextField1 and then clicks the Expand button, the height of TextField2 increases to match the height of TextField1.



To see this scripting example and others, visit the [Developer Center](#).

Scripting for the Expand button

The following script is for the Expand button:

```
var newHeight = xfa.layout.h(TextField1, "in");
TextField2.h = newHeight + "in";
```

Setting a field as required at run time

This example demonstrates how to make a field required at run time.

In this example, when the Set as Required button is clicked, if the form filler attempts to submit a form without typing some text in TextField1, an error message appears.



To see this scripting example and others, visit the [Developer Center](#).

Scripting for the Set as Required button

The following script is for the Set as Required button:

```
TextField1.validate.nullTest = "error";
```

You can also use one of these two scripts:

```
TextField1.mandatory = "error"
TextField1.mandatoryMessage = "this field is mandatory!"
```

Calculating the field sums

This example demonstrates how to calculate the sums of fields located at different levels of the form hierarchy when the form filler opens the form in a client application, such as Acrobat Professional, Adobe Reader, or HTML client.

NumericField1	3
NumericField1	3
NumericField1	3
<hr/>	
Sum	9

To see this scripting example and others, visit [tvisit the Developer Center](#).

Scripting for calculating the sum of repeating fields in a form

To calculate the sum of repeating fields in a form, you add a `calculate` event to the Sum field:

```
var fields = xfa.resolveNodes("NumericField1[*]");

var total = 0;
for (var i=0; i <= fields.length-1; i++) {
    total = total + fields.item(i).rawValue;
}

this.rawValue = total;
```

Scripting for calculating the sum of repeating fields

Similarly, to calculate the sum of repeating fields, you add a `calculate` event to the Sum field:

```
var fields = xfa.resolveNodes("detail[*].NumericField1");

var total = 0;
for (var i=0; i <= fields.length-1; i++) {
    total = total + fields.item(i).rawValue;
}

this.rawValue = total;
```

Scripting to calculate the sum of the fields on the page

To calculate the sum of the fields on the page, you add a `calculate` event to the Sum field:

```
var fields = xfa.layout.pageContent(0 , "field", 0);

var total = 0;
for (var i=0; i <= fields.length-1; i++) {
    if (fields.item(i).name == "NumericField1") {
        total = total + fields.item(i).rawValue;
    }
}

this.rawValue = total;
```

Highlighting fields in response to form filler interaction

This example demonstrates how to highlight the current field that a form filler is working with, highlight fields that a form filler is required to fill, and use message boxes to provide feedback to the form filler.

In this example, an asterisk (*) appears to the right of the required fields. When a field is selected, the field border changes to blue. If the form filler clicks the Verify Data button without having filled the required fields, a message appears and the field changes to red. If all the required fields are filled, a confirmation message appears when the form filler clicks the Verify Data button.

The form contains the following fields:

- Name:
- Address:
- City: *
- State: *
- Country: *
- Zip Code: *
- Telephone:
- Email:

A large button labeled "Verify data" is located at the bottom center of the form.

To see this scripting example and others, visit tvisit the [Developer Center](#).

Scripting for adding a blue border around a selected field

To add the blue border around the selected field, add the following scripts to each text field:

For example, add an `enter` event to the Name field:

```
Name.border.edge.color.value = "0,0,255";
```

For example, add an `exit` event to the Name field:

```
Name.border.edge.color.value = "255,255,255";
```

For example, add a `mouseEnter` event to the Name field:

```
Name.border.edge.color.value = "0,0,255";
```

For example, add a `mouseExit` event to the Name field:

```
Name.border.edge.color.value = "255,255,255";
```

Scripting for the Verify Data button

The following script, which is created for the Verify Data button, performs a series of checks to verify that the required fields contain data. In this case, each field is individually checked to verify that the value of the field is non-null or an empty string. If the value of the field is null or an empty string, an alert message appears indicating that data must be input into the field and the background color of the fillable area is changed to red.

Use this variable to indicate whether a field does not contain data:

```
var iVar = 0;

if ((Name.rawValue == null) || (Name.rawValue == "")) {
    xfa.host.messageBox("Please enter a value in the Name field.");
```

This script changes the color of the fillable area of the text field:

```
xfa.resolveNode("Name.ui.#textEdit.border.edge").stroke = "solid";
xfa.resolveNode("Name.ui.#textEdit.border.fill.color").value = "255,100,50";

// Set the variable to indicate that this field does not contain data.
iVar = 1;
}
else {
    // Reset the fillable area of the text field.
    xfa.resolveNode("Name.ui.#textEdit.border.edge").stroke = "lowered";
    xfa.resolveNode("Name.ui.#textEdit.border.fill.color").value = "255,255,255";
}

if ((Address.rawValue == null) || (Address.rawValue == ""))
    xfa.host.messageBox("Please enter a value in the Address field.");
```

This script changes the color of the fillable area of the text field:

```
xfa.resolveNode("Address.ui.#textEdit.border.edge").stroke = "solid";
xfa.resolveNode("Address.ui.#textEdit.border.fill.color").value = "255,100,50";
```

This script sets the variable to indicate that this field does not contain data:

```
iVar = 1;
}
else {
```

This script resets the fillable area of the text field:

```
xfa.resolveNode("Address.ui.#textEdit.border.edge").stroke = "lowered";
xfa.resolveNode("Address.ui.#textEdit.border.fill.color").value = "255,255,255";
}

if ((City.rawValue == null) || (City.rawValue == ""))
    xfa.host.messageBox("Please enter a value in the City field.");
```

This script changes the color of the fillable area of the text field:

```
xfa.resolveNode("City.ui.#textEdit.border.edge").stroke = "solid";
xfa.resolveNode("City.ui.#textEdit.border.fill.color").value = "255,100,50";
```

This script sets the variable to indicate that this field does not contain data:

```
iVar = 1;
}
else {
```

This script resets the fillable area of the text field:

```
xfa.resolveNode("City.ui.#textEdit.border.edge").stroke = "lowered";
xfa.resolveNode("City.ui.#textEdit.border.fill.color").value = "255,255,255";
}

if ((State.rawValue == null) || (State.rawValue == ""))
    xfa.host.messageBox("Please enter a value in the State field.");
```

This script changes the color of the fillable area of the text field:

```
xfa.resolveNode("State.ui.#textEdit.border.edge").stroke = "solid";
xfa.resolveNode("State.ui.#textEdit.border.fill.color").value = "255,100,50";
```

This script sets the variable to indicate that this field does not contain data:

```
iVar = 1;
}
else {
```

This script resets the fillable area of the text field:

```
xfa.resolveNode("State.ui.#textEdit.border.edge").stroke = "lowered";
xfa.resolveNode("State.ui.#textEdit.border.fill.color").value = "255,255,255";
}

if ((ZipCode.rawValue == null) || (ZipCode.rawValue == ""))
    xfa.host.messageBox("Please enter a value in the Zip Code field.");
```

This script changes the color of the fillable area of the text field:

```
xfa.resolveNode("ZipCode.ui.#textEdit.border.edge").stroke = "solid";
xfa.resolveNode("ZipCode.ui.#textEdit.border.fill.color").value = "255,100,50";
```

This script sets the variable to indicate that this field does not contain data:

```
iVar = 1;
}
else {
```

This script resets the fillable area of the text field:

```
xfa.resolveNode("ZipCode.ui.#textEdit.border.edge").stroke = "lowered";
xfa.resolveNode("ZipCode.ui.#textEdit.border.fill.color").value = "255,255,255";
}

if ((Country.rawValue == null) || (Country.rawValue == ""))
    xfa.host.messageBox("Please enter a value in the Country field.");
```

This script changes the color of the fillable area of the text field:

```
xfa.resolveNode("Country.ui.#textEdit.border.edge").stroke = "solid";
xfa.resolveNode("Country.ui.#textEdit.border.fill.color").value = "255,100,50";
```

This script sets the variable to indicate that this field does not contain data.

```
iVar = 1;
}
else {
```

This script resets the fillable area of the text field.

```
xfa.resolveNode("Country.ui.#textEdit.border.edge").stroke = "lowered";
xfa.resolveNode("Country.ui.#textEdit.border.fill.color").value = "255,255,255";
}
```

If all of the required fields contain data, the iVar variable is set to zero, and a confirmation message appears:

```
if (iVar == 0) {
    xfa.host.messageBox("Thank you for inputting your information.");
}
```

Resetting the values of the current subform

This example demonstrates how to reset the values of a specific set of fields, not the whole form. To do this, reset only the fields in the required subform object.

In this example, the form filler can click the Clear button to reset the field values.

1			▼		<input type="button" value="Clear"/>
2			▼		<input type="button" value="Clear"/>
3			▼		<input type="button" value="Clear"/>

To see this scripting example and others, visit the [Developer Center](#).

Scripting for the values that appear in the left column

Type this script for the values appearing in the left column:

```
this.rawValue = this.parent.index + 1;
```

To reset the default values add a `click` event to the Clear button. You need a dynamic reference syntax expression because the detail is a repeating subform and must be reflected in the reference syntax expression. In this situation, it is easier to build the `resetData` parameters separately.

```
var f1 = this.parent.somExpression + ".TextField2" + ",";
var f2 = f1 + this.parent.somExpression + ".DropDownList1" + ",";
var f3 = f2 + this.parent.somExpression + ".NumericField1";

// ...and pass the variable as a parameter.
xfa.host.resetData(f3);
```

Changing the presence of a form design object

Designer provides the following presence settings for the different objects on a form through various tabs in the Object palette. The Invisible and Hidden (Exclude from Layout) settings are unavailable for groups, content areas, master pages, page set, and subform set objects.

Note: To change the presence setting of an object by using scripts, you must change the value of two underlying XML Form Object Model properties: `presence` and `relevant`.

The following table lists the presence settings and the corresponding reference syntax.

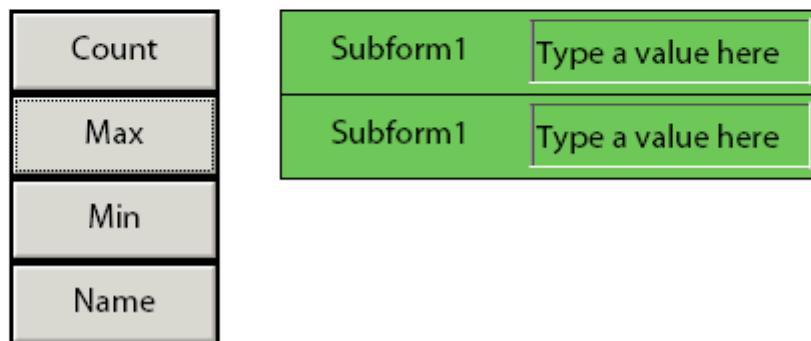
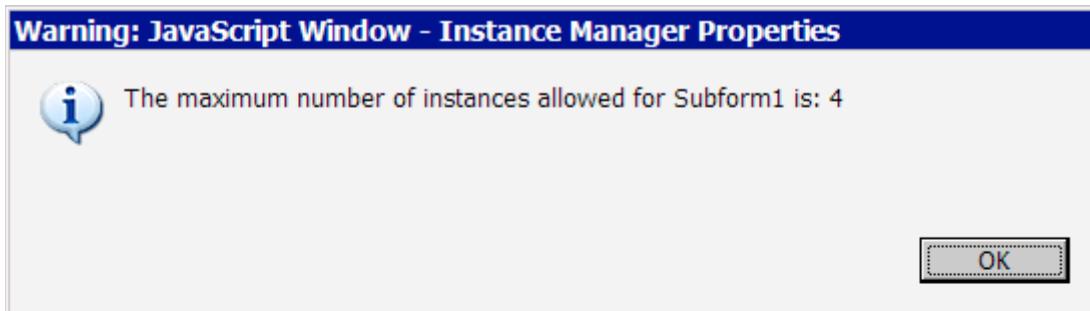
Presence setting	Reference syntax
Visible	FormCalc <code>ObjectName.presence = "visible"</code> JavaScript <code>ObjectName.presence = "visible";</code>
Visible (Screen Only)	FormCalc <code>ObjectName.presence = "visible"</code> <code>ObjectName.relevant = "-print"</code> JavaScript <code>ObjectName.presence = "visible";</code> <code>ObjectName.relevant = "-print";</code>
Visible (Print Only)	FormCalc <code>ObjectName.presence = "visible"</code> <code>ObjectName.relevant = "+print"</code> JavaScript <code>ObjectName.presence = "visible";</code> <code>ObjectName.relevant = "+print";</code>
Invisible	FormCalc <code>ObjectName.presence = "invisible"</code> JavaScript <code>ObjectName.presence = "invisible";</code>

Presence setting	Reference syntax
Hidden (Exclude from Layout)	FormCalc <pre>ObjectName.presence = "hidden"</pre> JavaScript <pre>ObjectName.presence = "hidden";</pre>
One-sided Printing Only	FormCalc <pre>ObjectName.presence = "simplex"</pre> JavaScript <pre>ObjectName.presence = "simplex";</pre>
Two-sided Printing Only	FormCalc <pre>ObjectName.presence = "duplex"</pre> JavaScript <pre>ObjectName.presence = "duplex";</pre>

Using the properties of the instance manager to control subforms

This example demonstrates how to use the properties of the instance manager (which is part of the XML Form Object Model) to retrieve information about subforms at run time.

In the following form, the four buttons provide information about Subform1 by using the instance manager's scripting properties. For example, when the form filler clicks the Max button, a message describing the allowed maximum number of supported Subform1 instances appears.



Scripting for the message box to output the value of the count property

The following script uses the `messageBox` method to output the value of the `count` property:

```
xfa.host.messageBox("The current number of Subform1 instances on the
form is:" + properties.Subform1.instanceManager.count, "Instance Manager
Properties", 3);
```

You can also write this script by using the underscore (`_`) notation to reference the `count` property of the instance manager, as shown here:

```
xfa.host.messageBox("The current number of Subform1 instances on the form
is: " + properties._Subform1.count, "Instance Manager Properties", 3);
```

The underscore (`_`) notation is especially important if no subform instances currently exist on the form.

Scripting for the message box to output the value of the max property

The following script uses the `messageBox` method to output the value of the `max` property:

```
xfa.host.messageBox("The maximum number of instances allowed for Subform1
is: " + properties.Subform1.instanceManager.max, "Instance Manager
Properties", 3);
```

You can also write this script by using the underscore (`_`) notation to reference the `max` property of the instance manager, as shown here:

```
xfa.host.messageBox("The maximum number of instances allowed for Subform1
is: " + properties._Subform1.max, "Instance Manager Properties", 3);
```

Scripting for the message box to output the value of the min property

The following script uses the `messageBox` method to output the value of the `min` property:

```
xfa.host.messageBox("The minimum number of instances allowed for Subform1
is: " + properties.Subform1.instanceManager.min, "Instance Manager
Properties", 3);
```

You can also write this script by using the underscore (`_`) notation to reference the `min` property of the instance manager, as shown here:

```
xfa.host.messageBox("The minimum number of instances allowed for Subform1
is: " + properties._Subform1.min, "Instance Manager Properties", 3);
```

Scripting for the message box to output the name of the subform property

The following script uses the `messageBox` method to output the name of the `subform` property:

```
xfa.host.messageBox("The name of the subform using the instance manager name
property is: " + properties.Subform1.instanceManager.name +
".\n\nNote: This value is different than the value returned by the name
property for the Subform1 object." , "Instance Manager Properties", 3);
```

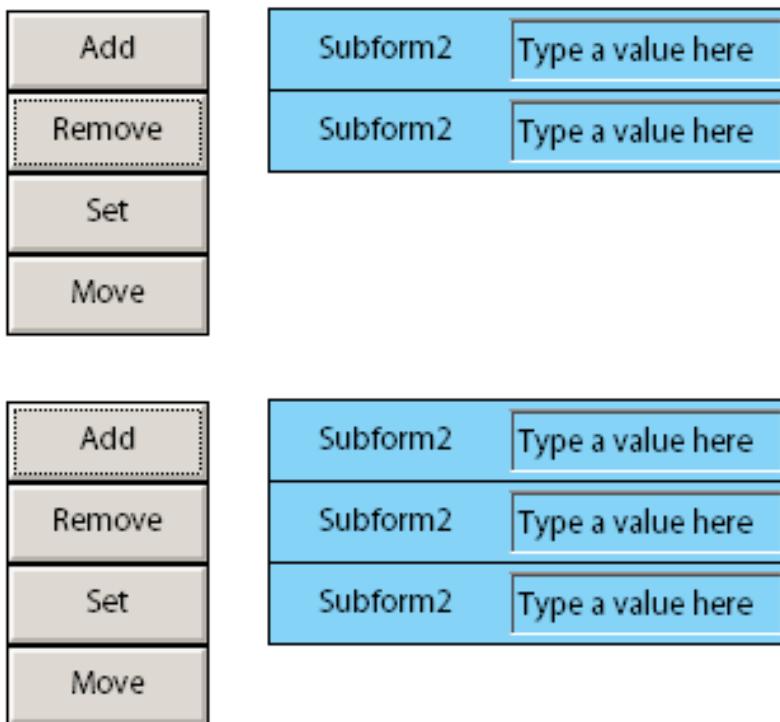
You can also write this script by using the underscore (`_`) notation to reference the `name` property of the instance manager, as shown here:

```
xfa.host.messageBox("The name of the subform using the instance manager name
property is: " + properties._Subform1.name +
".\n\nNote: This value is different than the value returned by the name
property for the Subform1 object." , "Instance Manager Properties", 3);
```

Using the methods of the instance manager to control subforms

This example demonstrates how to use the methods of the instance manager (which is part of the XML Form Object Model) to perform operations on subform objects at run time. For example, you can add remove instances of a particular subform, table, or table row.

In the following form, the form filler uses the four buttons to use the various instance manager scripting methods. For example, when the form filler clicks the Add button a new Subform2 instance is added to the form.



Note: The Move button reorders the first two Subform2 instances, and the Set button displays the maximum number of Subform2 instances. In both cases, you may need to add or remove subforms, or make changes to the data in the text fields to see the changes applied to the Subform2 instances.

Scripting to determine whether you added the maximum number of subforms to a form

The following script determines whether the supported maximum number of Subform2 instances exist on the form. If the maximum number exists, the script displays a message. Otherwise, a new Subform2 instance is added to the form.

```
if (methods.Subform2.instanceManager.count ==  
    methods.Subform2.instanceManager.max) {  
    xfa.host.messageBox("You have reached the maximum number of items allowed.",  
    "Instance Manager Methods", 1);  
}  
else {  
    methods.Subform2.instanceManager.addInstance(1);  
    xfa.form.recalculate(1);  
}
```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```
if (methods._Subform2.count == methods._Subform1.max) {
    xfa.host.messageBox("You have reached the maximum number of items
    allowed.", "Instance Manager Methods", 1);
}
else {
    methods._Subform2.addInstance(1);
    xfa.form.recalculate(1);
}
```

Scripting to determine whether there are more subforms to remove on the form

The following script determines whether any Subform2 instances exist on the form. If none exist, the script displays a message indicating that no instances exist. If instances do exist, the script removes the first instance from the form.

```
if (methods.Subform2.instanceManager.count == 0) {
    xfa.host.messageBox("There are no subform instances to remove.",
    "Instance Manager Methods", 1);
}
else {
    methods.Subform2.instanceManager.removeInstance(0);
    xfa.form.recalculate(1);
}
```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```
if (methods._Subform2.count == 0) {
    xfa.host.messageBox("There are no subform instances to remove.",
    "Instance Manager Methods", 1);
}
else {
    methods._Subform2.removeInstance(0);
    xfa.form.recalculate(1);
}
```

Scripting to force four subform instances to appear on the form

The following script forces four Subform2 instances to appear on the form regardless of how many instances currently exist:

```
methods.Subform2.instanceManager.setInstances(4);
```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```
methods._Subform2.setInstances(4);
```

Scripting to force the first and second subforms to switch locations on the form

The following script forces the first and second Subform2 instances to switch locations on the form.

```
methods.Subform2.instanceManager.moveInstance(0,1);
```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here.

```
methods._Subform2.moveInstance(0,1);
```

Using the instance manager to control subforms at run time

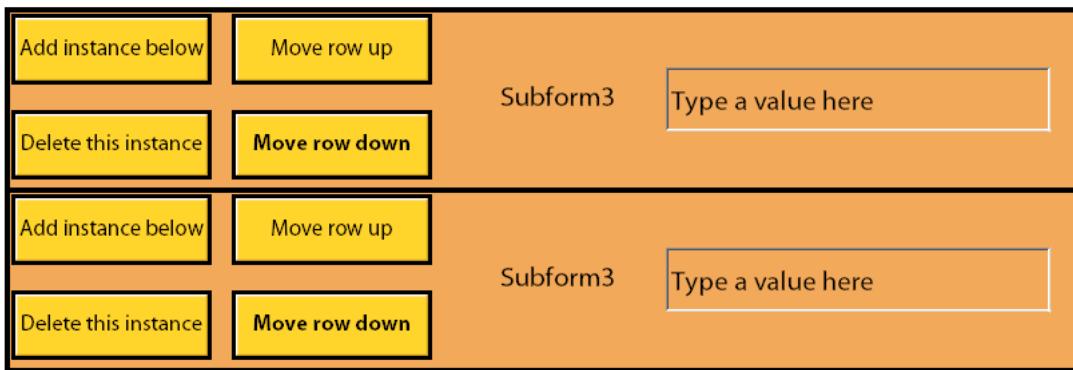
This example demonstrates how to use properties and methods of the instance manager to retrieve information about subforms and perform operations on subform objects at run time.

In this example, the form filler uses the buttons to perform various actions using instances of Subform3. For example, when the form filler clicks the Add Row Below button a new Subform3 instance is added below the current instance.

Note: You may need to add or remove subforms, or make changes to the data in the text field, to see the changes applied to the instances of Subform3.

Add a new subform This button adds a new Subform3 instance to the form.

Remove a subform This button deletes the first Subform3 instance from the form.



Note: If no instances of a particular subform exist on your form, you must use the underscore (_) notation provided with each example below. For more information about using the underscore (_) notation, see Designer Help.

Scripting the Add a New Subform button

The following script determines whether the supported maximum number of Subform3 instances exist on the form. If the maximum number exist, the script displays a message. Otherwise, a new Subform3 instance is added to the form.

```
if (advanced.Subform3.instanceManager.count ==  
    advanced.Subform3.instanceManager.max) {  
    xfa.host.messageBox("You have reached the maximum number of items  
    allowed.", "Combining Instance Manager Concepts", 1);  
}  
else {  
    advanced.Subform3.instanceManager.addInstance(1);  
    xfa.form.recalculate(1);  
}
```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```

if (advanced._Subform3.count == advanced._Subform3.max) {
    xfa.host.messageBox("You have reached the maximum number of items
    allowed.", "Combining Instance Manager Concepts", 1);
}
else {
    advanced._Subform3.addInstance(1);
    xfa.form.recalculate(1);
}

```

Scripting the Remove a Subform button

The following script determines whether any Subform3 instances exist on the form. If none exist, the script displays a message indicating that no instances exist. If instances exist, the script removes the first instance from the form.

```

if (advanced.Subform3.instanceManager.count == 0) {
    xfa.host.messageBox("There are no subform instances to remove.",
    "Combining Instance Manager Concepts", 1);
}
else {
    advanced.Subform3.instanceManager.removeInstance(0);
}

```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```

if (advanced._Subform3.count == 0) {
    xfa.host.messageBox("There are no subform instances to remove.",
    "Combining Instance Manager Concepts", 1);
}
else {
    advanced._Subform3.removeInstance(0);
}

```

Scripting the Add Instance Below button

The following if-else statement prevents the script from proceeding if the form currently contains the maximum number of Subform3 instances:

```

if (Subform3.instanceManager.count < Subform3.instanceManager.occur.max) {
//oNewInstance stores an instance of Subform3 created by the addInstance() method.
    var oNewInstance = Subform3.instanceManager.addInstance(1);
//nIndexFrom and nIndexTo store the before and after index values to use with the
moveInstance() method.
    var nIndexFrom = oNewInstance.index;
    var nIndexTo = Subform3.index + 1;
}

```

In this case, when the script references the value for nIndexFrom, the new instance of Subform3 is added to the form in the position specified in the moveInstance method:

```

    Subform3.instanceManager.moveInstance(nIndexFrom, nIndexTo);
}
else {
    xfa.host.messageBox("You have reached the maximum number of items
    allowed.", "Combining Instance Manager Concepts", 1);
}

```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```

if (_Subform3.count < _Subform3.occur.max) {
    var oNewInstance = _Subform3.addInstance(1);
    var nIndexFrom = oNewInstance.index;
    var nIndexTo = Subform3.index + 1;
    _Subform3.moveInstance(nIndexFrom, nIndexTo);
}
else {
    xfa.host.messageBox("You have reached the maximum number of items allowed.", "Combining Instance Manager Concepts", 1);
}

```

Scripting the Delete This Instance button

The following if-else statement prevents the script from proceeding if the form currently contains the minimum number of Subform3 instances.

```
if (Subform3.instanceManager.count > Subform3.instanceManager.occur.min) {
```

This script uses the removeInstance method to remove an instance of Subform3.

Note: This script uses the value `parent.parent.index` to indicate the Subform3 instance to remove. The `parent` reference indicates the container of the object using the reference. In this case, using the reference `parent.index` would indicate the untitled subform that contains the Add Instance Below, Delete This Instance, Move Row Up, and Move Row Down buttons.

```

    Subform3.instanceManager.removeInstance(parent.parent.index);
}
else {
    xfa.host.messageBox("You have reached the minimum number of items allowed.", "Combining Instance Manager Concepts", 1);
}

```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```

if (_Subform3.count > _Subform3.occur.min) {
    Subform3.removeInstance(Subform3.index);
}
else {
    xfa.host.messageBox("You have reached the minimum number of items allowed.", "Combining Instance Manager Concepts", 1);
}

```

Scripting the Move Row Up button

The following if-else statement prevents the script from proceeding if the instance of Subform3 appears as the first instance in the list:

```

if (Subform3.index != 0) {
    //nIndexFrom and nIndexTo store the before and after index values to use with the moveInstance method.
    var nIndexFrom = Subform3.index;
    var nIndexTo = Subform3.index - 1;
    Subform3.instanceManager.moveInstance(nIndexFrom, nIndexTo);
}
else {
    xfa.host.messageBox("The current item cannot be moved because it is the first instance in the list.", "Combining Instance Manager Concepts", 1);
}

```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```
if (Subform3.index != 0) {  
    var nIndexFrom = Subform3.index;  
    var nIndexTo = Subform3.index - 1;  
    Subform3.moveInstance(nIndexFrom, nIndexTo);  
}  
else {  
    xfa.host.messageBox("The current item can't be moved since it already is the first  
instance in the list.", "Combining Instance Manager Concepts", 1);  
}
```

Scripting the Move Row Down button

This variable stores the index value of the instance of Subform3:

```
var nIndex = Subform3.index;
```

The following if-else statement prevents the script from proceeding if the instance of Subform3 appears as the last instance in the list:

```
if ((nIndex + 1) < Subform3.instanceManager.count) {  
    // nIndexFrom and nIndexTo store the before and after index values to use with the  
    moveInstance() method.  
    var nIndexFrom = nIndex;  
    var nIndexTo = nIndex + 1;  
  
    Subform3.instanceManager.moveInstance(nIndexFrom, nIndexTo);  
}  
else {  
    xfa.host.messageBox("The current item cannot be moved because it is the last  
instance in the list.", "Combining Instance Manager Concepts", 1);  
}
```

You can also write this script by using the underscore (_) notation to reference the properties and methods of the instance manager, as shown here:

```
var nIndex = Subform3.index;  
if ((nIndex + 1) < Subform3.instanceManager.count) {  
    var nIndexFrom = nIndex;  
    var nIndexTo = nIndex + 1;  
    _Subform3.moveInstance(nIndexFrom, nIndexTo);  
}  
else {  
    xfa.host.messageBox("The current item can't be moved since it already is the  
last instance in the list.", "Combining Instance Manager Concepts", 1);  
}
```