

Flash Action Script 3.0 – Advanced Training

About this Training

This training provides a foundation for developing applications in ActionScript 3.0. To best understand the ideas and techniques described, you should already be familiar with general programming concepts such as data types, variables, loops, and functions. You should also understand basic object-oriented programming concepts such as classes and inheritance. Prior knowledge of ActionScript 1.0 or ActionScript 2.0 is helpful but not necessary.

Content

Chapter 1: Introduction to ActionScript 3.0

- About ActionScript.
- Advantages of ActionScript 3.0
- What's new in ActionScript 3.0
- Core language features
- Flash Player API features
- Compatibility with previous versions

Chapter 2: Getting started with ActionScript

- Programming fundamentals
- What computer programs do
- Variables and constants
- Data types
- Working with objects.
- Properties
- Methods
- Events.
- Basic event handling
- Examining the event-handling process
- Event-handling examples
- Creating object instances.
- Common program elements
- Example: Animation portfolio piece

Building applications with ActionScript.
Options for organizing your code
Choosing the right tool
The ActionScript development process
Creating your own classes
Strategies for designing a class
Writing the code for a class
Suggestions for organizing your classes
Example: Creating a basic application
Running subsequent examples

Chapter 3: ActionScript language and syntax

Language overview.
Objects and classes
Packages and namespaces
Packages
Namespaces
Variables
Data types
Type checking
Dynamic classes
Data type descriptions
Type conversions
Syntax
Operators
Conditionals
Looping
Functions.
Basic function concepts
Function parameters
Functions as objects
Function scope

Chapter 4: Object-oriented programming in ActionScript

Basics of object-oriented programming.

Classes.

Class definitions

Class property attributes

Variables

Methods

Enumerations with classes

Embedded asset classes.

Interfaces.

Inheritance.

Advanced topics

Example: GeometricShapes

Chapter 5: Working with dates and times.

Basics of dates and times.

Managing calendar dates and times

Controlling time intervals

Example: Simple analog clock.

Chapter 6: Working with strings

Basics of strings

Creating strings.

The length property

Working with characters in strings

Comparing strings

Obtaining string representations of other objects

Concatenating strings

Finding substrings and patterns in strings

Converting strings between uppercase and lowercase

Example: ASCII art

Chapter 7: Working with arrays

Basics of arrays.

Indexed arrays.
Associative arrays
Multidimensional arrays
Cloning arrays
Advanced topics
Example: PlayList.

Chapter 8: Handling errors

Basics of error handling
Types of errors
Error handling in ActionScript 3.0
ActionScript 3.0 error-handling elements
Error-handling strategies
Working with the debugger version of Flash Player
Handling synchronous errors in an application
Creating custom error classes
Responding to error events and status
Comparing the Error classes.
ECMAScript core Error classes.
ActionScript core Error classes
flash.error package Error classes
Example: CustomErrors application

Chapter 9: Using regular expressions.

Basics of regular expressions
Regular expression syntax.
Creating an instance of a regular expression
Characters, metacharacters, and metasequences
Character classes
Quantifiers
Alternation
Groups.
Flags and properties.
Methods for using regular expressions with strings.

Example: A Wiki parser

Chapter 10: Handling events

Basics of handling events

How ActionScript 3.0 event handling differs from earlier versions

The event flow

Event objects

Event listeners

Example: Alarm Clock

Chapter 11: Working with XML.

Basics of XML

The E4X approach to XML processing

XML objects

XMLList objects.

Initializing XML variables

Assembling and transforming XML objects.

Traversing XML structures

Using XML namespaces

XML type conversion

Reading external XML documents

Example: Loading RSS data from the Internet

Chapter 12: Display programming

Basics of display programming

Core display classes

Advantages of the display list approach

Working with display objects

Properties and methods of the DisplayObject class

Adding display objects to the display list

Working with display object containers

Traversing the display list

Setting Stage properties

Handling events for display objects

- Choosing a DisplayObject subclass.
- Manipulating display objects
- Changing position
- Panning and scrolling display objects
- Manipulating size and scaling objects.
- Controlling distortion when scaling
- Caching display objects
- When to enable caching
- Enabling bitmap caching
- Setting an opaque background color
- Applying blending modes.
- Adjusting DisplayObject colors.
- Setting color values with code
- Altering color and brightness effects with code
- Rotating objects
- Fading objects
- Masking display objects
- Animating objects.
- Loading display content dynamically
- Loading display objects
- Monitoring loading progress
- Specifying loading context
- Example: SpriteArranger

Chapter 13: Working with geometry

- Basics of geometry
- Using Point objects
- Using Rectangle objects.
- Using Matrix objects
- Example: Applying a matrix transformation to a display object

Chapter 14: Using the drawing API

- Basics of using the drawing API.
- Understanding the Graphics class

Drawing lines and curves
Drawing shapes using built-in methods
Creating gradient lines and fills.
Using the Math class with drawing methods
Animating with the drawing API
Example: Algorithmic Visual Generator

Chapter 15: Filtering display objects

Basics of filtering display objects.
Creating and applying filters
Creating a new filter
Applying a filter
How filters work.
Potential issues for working with filters
Available display filters
Bevel filter.
Blur filter
Drop shadow filter.
Glow filter
Gradient bevel filter.
Gradient glow filter
Example: Combining basic filters
Color matrix filter
Convolution filter
Displacement map filter.
Example: Filter Workbench.

Chapter 16: Working with movie clips.

Basics of movie clips
Working with MovieClip objects.
Controlling movie clip playback
Working with scenes
Creating MovieClip objects with ActionScript
Exporting library symbols for ActionScript

Loading an external SWF file
Example: RuntimeAssetsExplorer

Chapter 17: Working with text

Basics of working with text.
Displaying text.
Types of text
Modifying the text field contents
Displaying HTML text
Using images in text fields
Scrolling text in a text field.
Selecting and manipulating text
Capturing text input
Restricting text input
Formatting text
Assigning text formats
Applying cascading style sheets.
Loading an external CSS file.
Formatting ranges of text within a text field.
Advanced text rendering.
Working with static text.
Example: Newspaper-style text formatting
Reading the external CSS file
Arranging story elements on the page
Altering font size to fit the field size
Splitting text across multiple columns.

Chapter 18: Working with bitmaps.

Basics of working with bitmaps.
The Bitmap and BitmapData classes
Manipulating pixels.
Manipulating individual pixels
Pixel-level collision detection
Copying bitmap data

Making textures with noise functions.
Scrolling bitmaps
Example: Animating sprites using an offscreen bitmap

Chapter 19: Working with video

Basics of video
Understanding the Flash Video (FLV) format
Understanding the Video class
Loading video files
Controlling video playback
Detecting the end of a video stream
Streaming video files
Understanding cue points
Writing callback methods for onCuePoint and onMetaData
Set the NetStream object's client property to an Object
Create a custom class and define methods to handle the callback methods.
Extend the NetStream class and add methods to handle the callback methods.
Extend the NetStream class and make it dynamic
Set the NetStream object's client property to this.
Using cue points
Using video metadata.
Capturing camera input
Understanding the Camera class
Displaying camera content on-screen
Designing your camera application.
Connecting to a user's camera.
Verifying that cameras are installed
Detecting permissions for camera access
Maximizing video quality
Monitoring playback conditions.
Sending video to a server
Advanced topics
Flash Player compatibility with encoded FLV files
About configuring FLV files for hosting on a server

About targeting local FLV files on the Macintosh
Example: Video Jukebox

Chapter 20: Working with sound

- Basics of working with sound
- Understanding the sound architecture
- Loading external sound files
- Working with embedded sounds
- Working with streaming sound files
- Playing sounds
- Pausing and resuming a sound
- Monitoring playback.
- Stopping streaming sounds
- Security considerations when loading and playing sounds
- Controlling sound volume and panning
- Working with sound metadata
- Accessing raw sound data.
- Capturing sound input
- Accessing a microphone
- Routing microphone audio to local speakers.
- Altering microphone audio.
- Detecting microphone activity
- Sending audio to and from a media server.
- Example: Podcast Player
- Reading RSS data for a podcast channel
- Simplifying sound loading and playback using the SoundFacade class.
- Displaying playback progress
- Pausing and resuming playback.
- Extending the Podcast Player example

Chapter 21: Capturing user input

- Basics of user input
- Capturing keyboard input

Capturing mouse input
Example: WordSearch

Chapter 22: Networking and communication

Basics of networking and communication
Working with external data.
Connecting to other Flash Player instances.
Socket connections
Storing local data
Working with file upload and download
Example: Building a Telnet client
Example: Uploading and downloading files

Chapter 23: Client system environment

Basics of the client system environment.
Using the System class
Using the Capabilities class
Using the ApplicationDomain class
Using the IME class
Example: Detecting system capabilities

Chapter 24: Printing

Basics of printing.
Printing a page
Flash Player tasks and system printing.
Setting size, scale, and orientation
Example: Multiple-page printing
Example: Scaling, cropping, and responding

Chapter 25: Using the external API

Basics of using the external API.
External API requirements and advantages
Using the ExternalInterface class.
Getting information about the external container

Calling external code from ActionScript
Calling ActionScript code from the container.
The external API's XML format
Example: Using the external API with a web page container
Example: Using the external API with an ActiveX container

Chapter 26: Flash Player security

Flash Player security overview
Overview of permission controls
Security sandboxes.
Restricting networking APIs
Full-screen mode security
Loading content.
Cross-scripting.
Accessing loaded media as data
Loading data.
Loading embedded content from SWF files imported into a security domain
Working with legacy content
Setting LocalConnection permissions
Controlling access to scripts in a host web page
Shared objects
Camera, microphone, clipboard, mouse, and keyboard access

Using this Training

Chapters	Description
Chapters 1 through 4, overview of ActionScript programming	Discusses core ActionScript 3.0 concepts, including language syntax, statements and operators, the ECMAScript edition 4 draft language specification, object-oriented ActionScript programming, and the new approach to managing display objects on the Adobe Flash Player 9 display list.

Chapters 5 through 10, core ActionScript

Describes top-level data types in ActionScript 3.0 data types and classes 3.0 that are also part of the ECMAScript draft specification.

Chapters 11 through 26, Flash Player APIs

Describes important features that are implemented in packages and classes specific to Adobe Flash Player 9, including event handling, networking and communications, file input and output, the external interface, the application security model, and more.
