Lesson 5:
Multimedia on the Web

Learning Targets

I can:

- ❑ Define objects and their relationships to multimedia
- ❑ Explain the fundamentals of C, C++, Java, JavaScript, JScript, C#, ActiveX and VBScript
- ❑ Discuss security issues with objects
- ❑ Discuss the relationship between HTML5 and plug-ins
- ❑ Define compression and decompression
- ❑ Install plug-ins
- ❑ Identify plug-ins, add-ons and viewers
- ❑ Listen to and view multimedia objects within your browser
- ❑ Identify various file formats
- ❑ Download files and store them on your computer

Introduction

- Almost all Web sites, including corporate sites, feature multimedia content and interactive objects.

Watch Multimedia on the Web

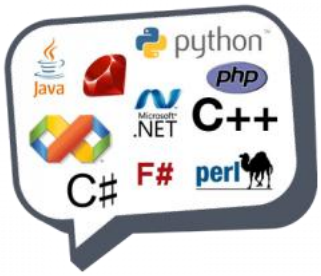
Objects, Active Content and Languages

- **Objects** enable Web authors to include multimedia effects
  - Also called *active content*, on their sites.
  - These objects can:
    - play sounds
    - show video clips and animation sequences
    - demonstrate ideas in 3-D simulations.

Objects, Active Content and Languages

Web authors use the following languages to create active content:

- C
- C++
- Java
- Java applets



Descriptive Drawing

- Pick a programing language from the list below. You are going to draw a descriptive picture that describes elements of the language.
- The purpose of this activity is to help you remember important information about the language and understand its process.
  - C#
  - C++
  - Java
  - Java Applets

Programming Languages

Programming Languages cause events to happen

- C creates operating systems and applications
- **C++** is a superset of C responsible for creating larger applications

- Java is used to distribute objects over a network
  - (*Cross-Platform functional)
  - Server Side - user doesn't see
  - Client Side – user sees a Java Applet
    - (Animates Pages, Adds Functionality, Access To Multimedia)

Java™

- # = Sharp
- Created by Microsoft
- Performs the same tasks as C++ and Java

*All are object-oriented - Individual objects on page perform separate functions

Active Content

1st scripting language used for online content

- Steps:
  - Retrieves The Page
  - Interprets The Script
  - Performs The Functions
- JavaScript *vs.* Jscript (?)
- - Firefox / Internet Explorer

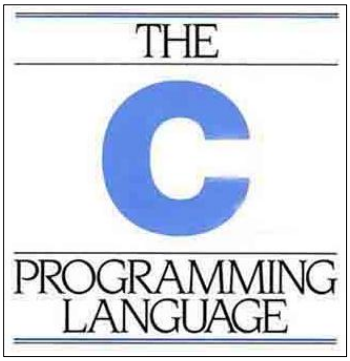
JavaScript

- Created by Microsoft – Internet Explorer
- Response to Java Applets
- Web pages include animation, audio and video

- Scripting Languages are used within programming languages to react to events:
  - Page loading/unloading
  - Scrolling
  - Mouse-click
  - Typing

Objects, Active Content and Languages

- **C** is a programming language used primarily to create operating systems and applications.
  - C is being replaced by C++ and Java.



Objects, Active Content and Languages

- **C++** – a superset of the C language that uses object oriented programming
  - C++ combines the traditional C language with object-oriented programming.
- **object-oriented programming (OOP)**- a program handled as a collection of individual objects that perform separate functions, rather than as a sequence of statements that performs a specific task.

DIFFERENCE between C++ and C:

- C++ uses a *completely different* set of programming concepts than **C** uses
- considered the best language for creating large applications.

Objects, Active Content and Languages

- **Java** – an object-oriented programming language (based on C) that concentrates on distributed objects over a network (Ex Internet)
  - Often used when data needs to be shared across the network.

Objects, Active Content and Languages

- **Java applets** – programs written in Java that are designed to run within a Web browser when accessed
  - Applets:
    - animate pages
    - add functionality and interactivity
    - access multimedia services
    - provide active content
- The term *applet* refers to many small programs
  - Most browsers, including Google Chrome, Mozilla Firefox and Windows Internet Explorer, support Java applets.

Objects, Active Content and Languages (cont' d)

- **JavaScript** – an event-driven scripting language designed to react whenever events occur
- The Web is *event-driven*.
  - For example, when you click or select an element on a Web page, you have caused an event.
    - Events include a mouse click, a mouse drag, text entered or a page loaded (or unloaded) in the browser.

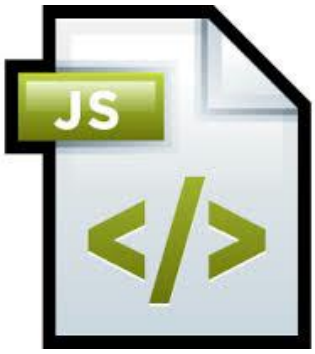
*JavaScript is an event-driven scripting language because it is designed to react whenever an event occurs.

Objects, Active Content and Languages (cont' d)

JavaScript	Java
• object-based scripting language • not a stand-alone programming language • developed by Netscape Communications • derives functionality from a collection of built-in objects	• object-oriented programming language • Can create stand-alone applications and Java applets • developed by Sun Microsystems • a scripting language called LiveScript and can add interactivity to Web pages.

Objects, Active Content and Languages (cont' d)

- **JScript** – a Microsoft version of JavaScript
- *JScript* is built into Windows Internet Explorer;
- *JavaScript* is built into Mozilla Firefox.
  - Because of the slight differences programs written in JavaScript may not function properly within Internet Explorer, and programs written in JScript may not function properly within Mozilla Firefox.



Objects, Active Content and Languages (cont' d)

- **C#** – a Microsoft version of Java
- Although the names are similar, JavaScript and Java are **completely different** languages and share **no** real similar features.

Objects, Active Content and Languages (cont' d)

- **ActiveX** – an open set of technologies for integrating components on the Internet and within Microsoft applications
  - Microsoft's response to Java applets.
- ActiveX technology enables authors to place interactive objects on their Web sites and allows the objects to work together.
- With ActiveX, Web pages can include:
  - animation
  - audio
  - video

Objects, Active Content and Languages (cont' d)

- **VBScript** – an object-oriented scripting language that Microsoft developed from the Visual Basic programming language
- VBScript can manipulate two types of objects.
  1. A standard HTML object
     - which is an common object such as those found on a form: a display button, radio button, check box or password field.
  2. ActiveX control
     - more powerful and flexible. The ActiveX functions of an object are activated by user action.

Objects and Security Issues

- Both **ActiveX and Java applets** allow information to be downloaded and run on your system
- Some downloaded content can cause problems ranging from inconvenience to loss of data
- Both Internet Explorer and Firefox provide control options to enable or disable the execution of Java programs and other active content
- You can also disable active content entirely

HTML5 vs. Plug-ins

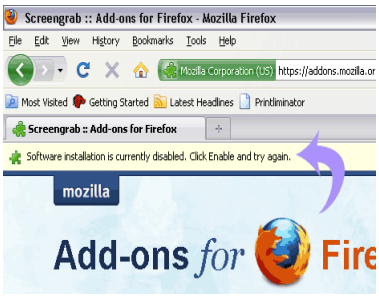
HTML5 is the latest version of HTML

- One of the major goals of HTML5 is to eliminate the use of browser plug-ins
- HTML5 is a standard provided by the W3C
- Most current browsers support HTML5
- HTML5 can produce dynamic multimedia content with JavaScript and Cascading Style Sheets (CSS)

Introduction to Plug-in Technology

Plug-ins are programs designed to extend basic browser functionality

- Plug-ins are associated with a specific platform (Windows or Mac OS X) and sometimes with a specific browser
- Plug-ins provide efficient integration of multimedia formats with the browser and computer
- Browsers launch plug-ins to play multimedia files

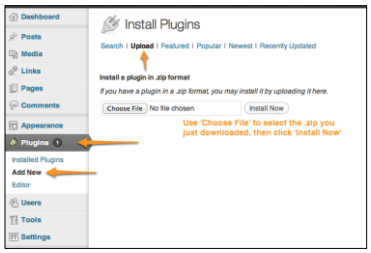


Data Compression and Decompression

- Compression is the reduction in size of data files
- Audio and video files are compressed before they are transferred across the Internet
- Compressed files must be decompressed so that they can be played
- Compression can be either lossy or lossless
- Plug-ins use standard compression / decompression algorithms called codecs to decompress and play streaming media

Plug-in Installation

- Online installation
- Offline installation
- Chrome, Internet Explorer and Firefox include several native plug-ins
  - It is advisable to occasionally upgrade plug-ins from the appropriate vendor's site. Upgrades usually include increased functionality and security updates



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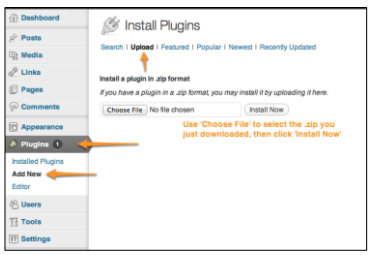


Types of Plug-ins and Viewers

- Adobe Flash Player
- Microsoft Silverlight
- Apple QuickTime
- Windows Media Player
- Firefox add-ons
- Microsoft PowerPoint Viewer
- Adobe Reader

Video File Formats

File Name Extension	Description
.avi	Standard video files for Windows
.mov .qt	Standard formats for QuickTime movies
.mp4	Standard format for movies on the Internet
.ogg	Video format designed for HTML5 video
.webm	Royalty-free, open video and audio format designed for HTML5 video

Audio File Formats

File Name Extension	Description
.au	Audio format used by UNIX servers
.aiff	High-quality audio format developed by Apple Computer
.mp3	Format for compressing audio files that uses the MPEG-1 standard
.ogg	Free alternative to MP3 format
.wav	Native sound format for Windows

Graphics File Formats

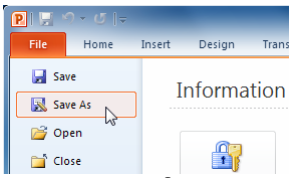
File Name Extension	Description
.png	Free open-source file format that has become an Internet standard for graphics
.gif	Bitmap format that uses lossless compression and supports various resolutions; limited to 256 colors; most effective for drawings or illustrations
.jpg .jpeg .jfif	Format that supports 16 million colors; uses lossy compression; widely used for photographs and complex graphics
.tif .tiff	Popular customizable format that supports grayscale, 8-bit and 24-bit color, and monochrome; commonly used for medical imaging and desktop publishing
.ps	Format designed for printing on postscript printers
.eps	Format used to import and export graphics files between operating systems and applications

Document File Formats

File Name Extension	Description
.txt	Plain (ASCII) text file; does not support formatting or images
.pdf	Format that supports formatting and images that can be read on any computer regardless of operating system; requires Adobe Reader for viewing the documents
.docx .doc	Formats for files created with Microsoft Word for Windows
.odt	Format for files created with Open Office Writer
.rtf	Supports images and formatting; compatible with many operating systems

Downloading Files with a Browser

- You can use a browser to:
  - Save an entire Web page
  - Save elements of a Web page
  - Download executable files or other types of files from the Internet to a specific location on your hard drive
  - Copy selections to the Clipboard



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- ✓ Download files and store them on your computer