JavaScript Context

INFO/CSE 100, Spring 2006
Fluency in Information Technology

http://www.cs.washington.edu/100
Readings and References

• References
  » Wikipedia articles on HTML, XML, XHTML and scripting languages
    http://en.wikipedia.org/wiki/HTML
    http://en.wikipedia.org/wiki/XHTML
  » IBM Home Page Reader 3.0
Language Layers

• Sure, JavaScript is fun. But where does it fit in the larger picture?

• *Markup language*
  » information structure and content, hyperlinking

• *Lightweight scripting language*
  » dynamic creation of HTML, response to events

• *Heavyweight programming language*
  » active graphics creation, numerical computation
Markup Language - HTML

• HyperText Markup Language
  » a language for describing the content and presentation of a web page
    • content: The meaning and structure of the web page
    • presentation: How the page is to be presented
  » HTML pages have a basic hierarchical structure defined by the tags
    • <html>, <head>, <body>, and so on
  » Basic HTML describes a static page
    • once parsed and rendered, the page doesn’t change
    • hyperlinking was the big step forward in basic HTML
Content vs. Presentation

• Early versions of HTML mixed these two ideas
  » For example: `<p align="left">`
  » The `<p>` tag identifies the basic structure of the page content
  » The `align="left"` attribute guides the presentation

• Newer versions are separating content and presentation
  » All "presentation attributes" of HTML elements were *deprecated* in HTML 4.01.
  » All "presentation attributes" of HTML elements are *not supported* in XHTML 1.0 Strict DTD.

• This separation is a very useful distinction to make
  » “what is the meaning?” vs “what is the format of the display?”
Why is this distinction useful?

• Once you have easy access to the structure and meaning, there are many useful ways to manage and present the information that is available

• Manage the information
  » extract a travel map from a directions page
  » filter an inventory list to select only certain attributes

• Present the information
  » graphical browser on a full-size screen
  » cell-phone browser display
Manage the information

• Information that is well structured can be
  » filtered, reorganized, used as program input, presented in a variety of reports, ...

• This is what a database program is used for
  » If we can separate the content from the presentation in web pages, we can use the web as a giant database
  » Not a single database, but we can use it like one

• Web scraping, screen scraping
  » extract the content and discard the presentation
New Brunswick, NJ, January 07, 2003 – Connotate Technologies, Inc., a leading provider of Web Mining solutions, today announced that Cinergy Marketing & Trading, L.P., a Houston affiliate of Cinergy Corp. has selected Connotate Technologies vTag Web Mining Server to **harvest energy market information from the web**. Using the server’s automated monitoring, extraction, filtering, and delivery capabilities, Cinergy can now **access energy information from hundreds of Web sources**. ...
Structured Data Example
Structured Data Example
request: web service protocol
response: HTML fragment
The Information School of the University of Washington

Giving meaning to *all* web data

Semantic Web

The **Semantic Web** provides a common framework that allows **data** to be shared and reused across application, enterprise, and community boundaries. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming.

"The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation."  -- Tim Berners-Lee, James Hendler, Ora Lassila, *The Semantic Web*, Scientific American, May 2001

The Semantic Web is based on two fundamental concepts:

- The description of the meaning of the content in the Web
- The automatic manipulation of these meanings
Present the information

• Once you have a database with a defined structure, you can present the information it contains in many different ways

• Define a style for presenting the data
  » Cascading Style Sheets associate style with structure

• Use a browser appropriate to the requirements
  » desktop graphical: MSIE, Mozilla, Opera, Safari
  » desktop text-only: Lynx, Links, WannaBe
  » Audio: IBM Home Page Reader 3.0
  » PDA and cell phone: Opera, WAP browsers, Pocket IE

• The information you want exists, but presenting it in a useful, timely, accessible fashion is a real challenge
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Lightweight Scripting Language

- JavaScript is a *scripting language*
  - has many features of larger languages but intended for more casual or rapid development
- Such languages are used to provide dynamic control of the content and display
  - intended to be used by web page developers, system administrators, and others to quickly develop useful applications
Server-side vs. Client-side?

- Two kinds of scripting languages for the web
- Client-side languages are executed by the web browser
  - Javascript, VBscript
- Server-side languages are executed by the web server
  - PHP, Perl, Python, ...
Other Scripting Languages

- **PHP** is an HTML-embedded scripting language. Much of its syntax is borrowed from C, Java and Perl with a couple of unique PHP-specific features thrown in. The goal of the language is to allow web developers to write dynamically generated pages quickly.

- **Python** is an interpreted, interactive, object-oriented programming language. It is often compared to Tcl, Perl, Scheme or Java. Python is also usable as an extension language for applications that need a programmable interface.

- **Perl** is a language optimized for scanning arbitrary text files, extracting information from those text files, and printing reports based on that information. It's also a good language for many system management tasks. The language is intended to be practical (easy to use, efficient, complete) rather than beautiful (tiny, elegant, minimal).

- **VBScript.** Microsoft Visual Basic Scripting Edition brings active scripting to a wide variety of environments, including Web client scripting in Microsoft Internet Explorer and Web server scripting in Microsoft Internet Information Service.
Dynamic HTML

• Dynamic HTML is a technique of creating interactive web sites by using a combination of
  » the static markup language HTML
  » the style definition language Cascading Style Sheets
  » a client-side scripting language

• A client-side scripting language provides
  » Adaptivity … the page can be customized
  » Interactivity … get user input and display results
  » Applications … build a general purpose program
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Larger Programming Languages

• Web browsers are handy, but many applications are large and need specialized capabilities
• Large applications are generally written in full featured programming languages like
  » Java, C++, C#, Fortran
  » These languages come with extensive function libraries to support extended networking, graphics, data structures, etc.
• Many new languages straddle the line and are appropriate for both scripting and large-scale development
Recommended for Suzi Soroczek

Recommendations Based on Activity

Your Watch List (Beta)

Recommendations by Category

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Apparel & Accessories
Baby
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Computers
Electronics
Gourmet Food
Health & Personal Care
Jewelry & Watches
Kitchen & Housewares
Magazine Subscriptions
Music
Outdoor Living

These recommendations are based on Items you own and more.

view: All | New Releases | Coming Soon

1. Harry Potter and the Goblet of Fire (Two-Disc Special Edition) (Harry Potter 4)
   DVD ~ Eric Sykes
   Average Customer Review: ★★★★★
   Release Date: March 7, 2006
   
   Our Price: $19.96 Used & new from $17.93
   
   Add to cart Add to Wish List

   Recommended because you purchased Harry Potter and the Goblet of Fire (Book 4) and more (edit)

2. Mind in Society: Development of Higher Psychological Processes
   by L. S. Vygotsky, et al.
   Average Customer Review: ★★★★★
   Publication Date: March 7, 2006
   
   Our Price: $16.49 Used & new from $14.80
   
   Add to cart Add to Wish List

   Recommended because you added Context and Consciousness to your Shopping Cart (edit)

3. Pride & Prejudice (Widescreen Edition)
   DVD ~ Matthew Macfadyen
   Average Customer Review: ★★★★

   Add to cart Add to Wish List

   Recommended because you purchased Pride and Prejudice and more (edit)
Recall the Sort Demo

- The code that actually does the sorting and graphics is written in Java.
- The programs are compiled and run as *applets*. They use the web page area for display, but are not working with HTML.

Bubble Sort

Quick Sort

http://java.sun.com/applets/jdk/1.0/demo/SortDemo/example1.html
Summary

• HTML forms the basic structure for web pages
  » Modern trends are to separate
    • the structural description of the data
    • the presentation of the data to the user
  » process the information according to the content
  » display the information as appropriate to the user

• Programming languages make information management and display dynamic
  » languages come in many flavors but they share many basic concepts and much of their basic syntax