What is HTML

- HyperText Markup Language
- A language used for documents on the Web
- Hypermedia system
  - text, images, video, audio, executable programs
  - hypertext via links (embedded cross-references)
- On-line manual authoring system
HTML Standards

- Conforms to SGML (ISO 8879)
  - Standard for defining structured document types & markup languages used to represent them
- HTML revisions:
  - HTML 2.0, HTML 2.0 with Netscape /IE extensions, 3.2, 4.x, Dynamic HTML, etc.
- W3C

Web Content Development Generics

- Web project types:
  - Informative, Interactive, Transactional, Delivery
- Common technologies:
  - HTML 4.x
  - JavaScript 1.2
  - CSS
  - Vendor specific HTML extensions
  - CGI
Web Presentation Control

- Interactivity
  - Scripting languages
  - Embedded programs (Java Applets, Active X)
- Layout and Presentation control
  - Style sheets
    - set HTML elements’ font faces, colors
  - Standards: CSS level 1 and 2
- Dynamic HTML
  - Combination of HTML, Scripting & CSS

HTML Tool-Based Development

- Create HTML documents:
  - WYSIWIG v.s. WYSMBWYG
- Issues:
  - Browser specific tags
  - Lack of editing guidelines
Useful Utilities

- HTML & Style Sheet Editors
  - CoffeeCup HTML Editor++ 98
  - CoffeeCup StyleSheet Maker++
- CGI Software
  - Perl & Perl applications
- Utilities
  - MapThis (image-map maker)
  - GIF construction Set (animated GIFs maker)
  - Graphic Workshop (image creation/manip.)

The World Wide Web and HTML

- HTML
  - Hypermedia document description language for publishing documents on the Web
- Internet
  - Global network
- The Web spans the Internet
HTML Terminology

- **HTML Elements**
  - Entities that represent structure or presentation behavior
    - e.g., paragraph, font

- **Markup Tags**
  - Used to specify structural elements
  - Start tag, content, and end tag

- **Empty Elements**
  - No content/end tag (e.g., horizontal rule)

HTML Terminology (continued)

- **Properties**
  - Provide name/instructions for elements display

- **Attributes**
  - Used to add properties to elements
    - e.g., `<H1 ALIGN="CENTER">The Tomato Place</H1>`

- **Case Sensitiveness**
  - HTML is not case-sensitive
  - Attribute values may be case sensitive
HTML Historical Overview

• 1980s
  – Tim Berners-Lee’s software tracking program
  – Prototype system developed at CERN
• 1990
  – First browser/editor developed at CERN
• 1993
  – First release of Mosaic browser by NCSA
  – Work with IETF to formalize HTML begins

HTML Historical Overview (continued)

• 1994
  – Word Wide Web Consortium (W3C)
  – W3C mission: develop common Web protocols
• 1996 and on
  – W3C HTML 3.2 release
    • text flow around images, tables, applets, superscripts/subscripts, vendor-driven extensions
  – HTML 4.0: tables, frames, scripting, internationalization, CSS, object inclusion
HTML Evolution Issues

- Deprecated elements
- Vendor-specific elements
- CSS v.s. vendor presentational tags
  - HTML should describe document structure, not presentation
  - CSS is about layout and presentation
- Good web designers must understand particular browser capabilities

Java & ActiveX

- Java & Java Applets
  - Both compiled and interpreted
  - Java bytecode is close to machine code & platform independent
  - Applets can be embedded in HTML documents
  - Access limited to local disk
- ActiveX
  - Trust-in-the-author security model & platform specific
Scripting

- Scripts are interpreted programs
- Scripts applications:
  - validating form input, creating animations, displaying alert box, etc.
- JavaScript:
  - First scripting language used on the web
  - Developed by Netscape in version 2.0
  - Object-based with some similarity to Java
- VBScript introduced in IE 3.0

Dynamic HTML

- Refers to HTML documents animated via various technologies
- Page animation requires precise placement of items in the window
- W3C model:
  - CSS v.s. Netscape’s LAYER element
  - DOM (platform & language-neutral interface allowing programs and scripts to dynamically access/update document content/structure/style
Web Browsers & Servers

• Web browsers are client applications
  – Can access local and web server information
  – Can get information from various types of servers
    • HTTP, FTP, SMTP, gopher, etc.

• Web servers:
  – Applications that allow HTML files to be linked across the network
  – Talk to browsers via the HTTP network protocol

Creating an HTML Document

• Use your favorite editor / add HTML commands by hand
• Use HTML editor / insert commands in appropriate locations
• Use WYSIWYG HTML editor
• Use conversion utility (e.g., word to HTML)
Creating an HTML Document (continued)

• Use favorite text editor
• File should have .html or .htm extension
• HTML 4.0 Document Organization
  – Version identifier
  – Declarative header section
  – Body containing document’s content
  – Markup tags to specify structural elements
• Document Type Declaration
  – <!DOCTYPE HTML PUBLIC …>  

Document Structure

• <HTML> tag should appear after the DOCTYPE with matching </HTML> at the end of the document
• Document should be organized into <HEAD> and <BODY>
• <BODY> contains the document’s content
  – May be used to set a background color or image
• Delineating markup tags are optional
• <TITLE> must occur within the <HEAD>
Basic HTML Tags

• Headings H1 through H6
• Paragraphs <P>, and <BR>
  – automatic word wrap / ignore carriage returns
  – closing tags not required
• Logical and physical style elements
  – <CITE> logical element
  – <STRONG>, <EM>, <B>, and <I>
• <HR>, <CENTER>
• <PRE> to display formatted text

Basic HTML Tags (continued)

• Lists:
  – UL / LI : bulleted list
  – OL / LI : numbered list
  – DL / DT (terms) / DD (def): definition list
• Images:
  – <IMG SRC="mypicture.gif" WIDTH=100
    HEIGHT=100 ALT="My Picture"
    ALIGN="RIGHT">
  – GIF / JPEG images (Photoshop, Paint Shop Pro)
Basic HTML Tags (continued)

• ADDRESS
  – Occur at end of documents to enclose author’s name/email
  – Usually displayed in italic style
• Comments <!-- (…) -->

More on DOCTYPE
http://validator.w3.org/lib/catalog

• Helps browsers infer doc element types, or validators select correct set of rules
  – <!DOCTYPE HTML PUBLIC “-//W3C//DTD HTML 4.0 Transitional//EN”
  “http://www.w3.org/TR/REC-html40/strict.dtd
  or loose.dtd or frameset.dtd”>
  – HTML 4.0 Strict (CSS only)
  – HTML 4.0 Transitional
    • Supports deprecated elements & attributes
  – HTML 4.0 Frameset (transitional + frames)
More on Document Structure

• HTML element attributes are LANG & DIR
  – DIR (base direction of directionally neutral text) can be LTR or RTL
  – LANG (primary language used in the document)
    • ISO 639 language code (x for experimental) +
      optional hyphen and ISO 3166 country code

• HEAD can be used to learn about document
  – Requires: TITLE
  – Optional tags: SCRIPT, STYPE, META, LINK, OBJECT, BASE

More on Document Structure (continued)

• TITLE
  – Only one title per document
  – Title should succinctly describe document
  – Keep titles under 64 characters
  – Title may not contain other HTML markups

• BODY
  – Begins as soon as any BODY element is found
  – Use tag to set attribute values
    • deprecated: BGCOLOR, TEXT, LINK, ALINK, VLINK, BACKGROUND, BGPROPERTIES
Background Images

- Small images as large images will delay the display
- Non interlaced
- Compatible with text color
- Simple
- Choose background color that matches main color in background image

Headings

- Most HTML elements share common attributes
- Hx STYLE attribute:
  - Inline style sheet support
  - Version 3 or greater of Internet Explorer
  - Version 4 and above of NetScape Navigator
- Hx ALIGN (deprecated) & text-align prop (use both ALIGN & STYLE attributes)
Paragraphs

- Align attribute (deprecated)
  - CENTER, LEFT, RIGHT, JUSTIFY
- text-align STYLE property
- `<P STYLE="font-family:Arial>`

Logical & Physical Style Elements

- BIG & SMALL can be nested to accentuate their effects
- Logical styles are preferable as browser can select appropriate display style
Subscript & Superscript

- `<SUB>`
- `<SUP>`
- Enclosed text displayed in smaller font relative to regular font size

Font Settings: FONT (deprecated)

- SIZE attribute
  - `<FONT SIZE=1>1</FONT>`
  - `<FONT SIZE=+3>6</FONT>`
- COLOR attribute
  - `<FONT COLOR="LIME">Lime-colored text</FONT>`
  - `<FONT COLOR="#RRGGBB">Colored text</FONT>`
Font Settings: FONT  
(deprecated)

- FACE attribute
- POINT-SIZE, WEIGHT (Netscape only)  
  - font-family & font-size STYLE property
- EFFECT, TRANSPARENCY (webTV only)

Other Basic Body Elements

- Default Font Size: BASEFONT  
  (deprecated)
- Special characters  
  - &copy, &reg, &nbsp, &lt, &gt, &amp, &quot  
  - Accented characters
  - Escape sequences are case sensitive
- Horizontal lines: HR  
  - SIGN, WIDTH, ALIGN, NOSHADE (deprec.)
Other Basic Body Elements (continued)

- Preformatted Text: PRE
  - WIDTH attribute
- Quotations: BLOCKQUOTE & Q
- Line Breaks: BR
  - CLEAR (none, left, right, all)
- No Break: NOBR
- Word Break: WBR
- Adresses: ADDRESS

Other Basic Body Elements (continued)

- Center: CENTER (deprecated)
- DIV & SPAN
  - DIV is a block element (single blank line before and after)
  - DIV can hold other block elements
  - SPAN is an inline element (not surrounded by line breaks)
  - ALIGN attribute (left, right, center, justify)
- Comments: <!-->
Common Attributes

• ID
  – target anchor for hypertext link
  – Style sheet selector
  – Means to ref. A particular element from a script
  – Name of an object element
  – General purpose processing by user agents
  – Can be used with all elements but BASE, HEAD, HTML, META, SCRIPT, STYLE, TITLE

Common Attributes (continued)

• CLASS
  – Assign one or more names to an element
  – Style sheet selector
  – General purpose processing by browsers

• TITLE
  – Provide additional information about an element
HTML Lists

- Unnumbered (bulleted lists)
  - TYPE attribute (deprecated)
- Numbered lists
  - OL attributes: TYPE & START (deprecated)
  - LI attributes: TYPE & VALUE (deprecated)
- STYLE: list-style-type
  - Preferred method for setting bullet type
  - Can be set at the item or entire list level

HTML Lists (continued)

- Definition lists
- Menu lists (deprecated)
- Directory lists (deprecated)
- COMPACT attribute (deprecated)
- Multiple-Paragraph List Items
- Nested Lists
URLs, Links, and META

• URLs
  – without a file name
  – index.html, default.html, home.html
  – Anchor element <A HREF=“URL”</A>
  – TITLE & TARGET attributes
  – JavaScript: onClick & Window properties
  – JavaScript: Focus
  – JavaScript: OnMouseOver

URLs, Links, and META (continued)

• Relative links
• Specific locations in other documents
  – NAME attribute of anchor tag
  – Use hash mark (#) to indicate a location within a URL
• References within a document
  – Same as specific locations in other documents but omit destination document name
• Special characters in URLs (use % ASCII)
• Other ways to use links
  – ftp://username:password@hostname/path
  – file://localhost/pathname
  – mailto:username@hostname
    • Delineate fields using & (cc, bcc, and body)
  – telnet://hostname:portnumber
  – gopher://hostname:port/gophertyoe[item]
  – news:newsgroup

• Document relations: LINK
• Meta information: META
  – Specify additional HTTP headers for page
  – Specify additional document header info
  – Attributes: HTTP-EQUIV, NAME, CONTENT
• BASE element
HTML Tables

• Tables: TABLE
• Table Attributes
• Captions: CAPTION
• VALIGN
• Rows and Cells: TR, TD, TH
• Cell Attributes
• Row Groupings: THEAD, TFOOT, TBODY

HTML Tables (continued)

• Column Groups: COLGROUP and COL
• COLGROUP
• COL
• Attribute Precedence
• Designing with Tables
• Page Layout with Tables
HTML Tables (continued)

- Making Lists with Tables
- Groupings and More
- Fonts in Tables
- Tables in Browsers without Table Support

HTML Frames

- FRAMESET
- Frames: FRAME
- Frame Navigation: TARGET and BASE
- BASE
- TARGET Attribute
- Predefined Targets
- Frame Navigation Guidelines
HTML Frames

- Updating Multiple Frames: onClick
- Content for Browsers without Frame Support: NOFRAMES
- Frame Tips
- IFRAME

HTML Color and Images

- Color Values
- RGB Color Values
- Color Depth and Dithering
- Browser-Safe Color Palette
- Check Your Color Depth
- Text Color Guidelines
- Images in HTML Documents
- Graphics Formats
HTML Color and Images (continued)

- Choosing an Image Format
- Graphics Interchange Format (GIF)
- Interlaced GIFs
- JPEG
- GIF vs. JPEG
- Other Image Formats
- Progressive JPEG
- PNG

HTML Color and Images (continued)

- Image Tips and Tricks
- Transparent Backgrounds
- Reducing Image Size
- Thumbnails
- Gamma
- Image Element: IMG
- Aligning Images: ALIGN Attribute
- Additional Extensions to ALIGN
HTML Color and Images (continued)

- Images and Text-Only Browsers: ALT Attribute
- BORDER (deprecated)
- WIDTH and HEIGHT
- HSPACE and VSPACE
- Low-Resolution Image: LOWSRC
- Image Maps, Images with Clickable Spots

HTML Color and Images (continued)

- Choosing Images for Image Map
- Server-Side Image Map Format
- Server-Side Clickable Images: ISMAP
- Client-Side Image Maps
- Client-Side Image Map Format: AREA and MAP
- Client-Side Clickable Images: USEMAP
HTML Animation, Sound, and Video

- Animation
- Server Push Animations
- Client Pull: META Refresh
- GIF Animations
- Creating a GIF Animation
- Installing GIF Construction Set
- Starting an Image
- Header Block

HTML Animation, Sound, and Video (continued)

- Loop Block
- Image Import
- Interactive Animation
- Java Applet Animation
- Cool Button Tool Pros and Cons
- Macromedia Flash
- Sound
HTML Animation, Sound, and Video (continued)

• Sound Issues
• Internet Explorer Sound Support: BGSOUND
• Macromedia's Shockwave
• Embedded Objects: EMBED
• Alternate Objects: NOEMBED
• Video

HTML Animation, Sound, and Video (continued)

• QuickTime
• MPEG
• Streaming Video
• Incorporating Video
• IMG DYNSRC Attribute
• Viewing and Serving Video
HTML Forms

- Forms: FORM
- METHOD Attribute
- ACTION Attribute
- ENCTYPE Attribute
- Form Input: INPUT
- TYPE Attribute
- CHECKBOX Type

HTML Forms (continued)

- RADIO Type
- HIDDEN Type
- TEXT Type
- PASSWORD Type
- SUBMIT and RESET Types
- IMAGE Type
- BUTTON Input Type
- FILE Input Type
HTML Forms (continued)

- TEXTAREA Input Type
- Textarea: TEXTAREA
- TEXTAREA Attribute: WRAP
- Pulldown Menu: SELECT, OPTION, and OPTGROUP
- SELECT
- SIZE Attribute
- MULTIPLE Attribute

HTML Forms (continued)

- OPTION Element
- Menu Groupings: OPTGROUP
- Navigation with SELECT
- BUTTON Element
- Label, Fieldset, and Legend
- ISINDEX (deprecated)
- PROMPT Attribute
- ISINDEX Examples
HTML Forms (continued)

• ISINDEX ACTION Attribute
• ISINDEX Data Flow
• ISINDEX versus FORM

Cookies and Server-Side Page Creation

• Cookies
• Restrictions
• CGI Scripts
• Creating CGI Scripts
• Headers
Cookies and Server-Side Page Creation (continued)

- Redirect Script
- Environment Variables
- Environment Variable Script
- Time Stamp CGI Script
- Dynamic Document Refresh
- Setting a Cookie with a CGI
- POST versus GET

Cookies and Server-Side Page Creation (continued)

- GET Method: METHOD="GET"
- POST Method: METHOD="POST"
- Form Data Format
- File Upload
- Serving Documents Based on Browser Type
- Security
- Using Premade CGI Scripts
Cookies and Server-Side Page Creation (continued)

- Server-Side Includes
- Configuration: config
- Document Inclusion: include
- Command Execution: exec
- Other Directives: echo, fsize, flastmod
- SSI Pros and Cons
- Other Server-Side Options

Cookies and Server-Side Page Creation (continued)

- Active Server Pages (ASP)
- LiveWire
- HTMLScript and PHP
- Secure Servers
Embedded Objects: Java and ActiveX

- Java Applets
- ActiveX
- VRML: Virtual Reality Markup Language
- Including External Objects
- Embed Element
- Applet Element
- PARAM Element
- Object Element

Cascading Style Sheets

- Style Sheet Rules
- Selectors
- Contextual Selectors
- Classes
- ID
- Pseudo-Classes and Pseudo-Elements
Cascading Style Sheets (continued)

- Incorporating Style Sheets
- STYLE Attribute
- STYLE Tag

Cascading Style Sheets (continued)

- LINK and @import
- The Cascade
- Inheritance
- Cascade Rules
- Units
- Absolute
- Relative
Cascading Style Sheets (continued)

- Choosing a Unit of Measurement
- The Browser Connection
- CSS Properties
- Font Properties
  - font-family
  - font-style
  - font-variant
  - font-weight

Cascading Style Sheets (continued)

- font-size
- font
- Color and Background Properties
  - color
  - background-color
  - background-image
  - background-repeat
  - background-attachment
Cascading Style Sheets
(continued)

• background-position
• background
• Text Properties
• word-spacing
• letter-spacing
• text-decoration
• vertical-align
• text-transform

Cascading Style Sheets
(continued)

• text-align
• text-indent
• line-height
• Classification and List Properties
• white-space
• list-style-type
• list-style-image
• list-style-position
Cascading Style Sheets (continued)

- list-style
- Drawbacks to Style Sheet Usage
- Style Sheets versus HTML Presentational Elements
- Style Sheet Tools
- Onward

Positioning with Style Sheets

- Background
- Box Properties
- margin-top
- margin-right
- margin-bottom
- margin-left
- margin
- padding-top
Positioning with Style Sheets
(continued)

• padding-right
• padding-bottom
• padding-left
• padding
• border-top-width
• border-right-width
• border-bottom-width
• border-left-width
Positioning with Style Sheets
(continued)

• Display Properties
• width
• height
• Positioning Properties
• position
• float
• clear
• top, left, right (CSS2), bottom (CSS2)

Positioning with Style Sheets
(continued)

• z-index
• overflow
• clip
• display
• visibility
Scripting

- JavaScript versus VBScript
- JavaScript Versions and ECMAScript
- Incorporating Scripts in HTML Documents
- Browsers That Do Not Support Scripts
- NOSCRipt Tag
- Script Placement
- Embedding Directives in HTML Tags

Scripting (continued)

- External Scripts
- Case-sensitivity
- JavaScript Variables
- Converting Strings to Numbers
- Variable Names
- Special Characters in Strings
- Operators
- Assignment Operators
Scripting (continued)

- Arithmetic Operators
- Concatenation Operator
- Logical Operators
- Comparison Operators
- Operator Precedence
- Creating New Objects
- Miscellaneous Operators: typeof and void

Scripting (continued)

- Comments
- Statements
- break
- continue
- delete
- do...while
- export
- for
Scripting (continued)

- for...in
- function
- if...else
- import
- labeled
- return
- switch/case
- this

Scripting (continued)

- var
- while
- with
- Conditional Expressions
- Global Functions
- escape
- isNaN
- Number
Scripting (continued)

- String
- unescape

Objects

- Built-in Objects
- Date Object
- Math Object
- Properties
- String Object
- String Methods
Objects (continued)

- Client-side Objects
- Window Object
- Properties
- Window Methods
- Location Object
- Document Object
- Properties
- Form Object

Objects (continued)

- Properties
- Methods
- Frame Object
- Image Object
- Navigator Object
- MimeType Object
- Plugin Object
- Event Handlers
JavaScript Uses

• View Source Button
• Browser Detection
• Checking for Features
• The Language Attribute
• Checking for Browser Type
• Browser Support for Specific Features
• Menu Bar Highlights
• Animation

JavaScript Uses (continued)

• Customizing a Script
• Customizing a Database
• Customized Web Pages with Cookies
• Retrieving Cookies
• Removing a Cookie
Web Site Setup

• Choosing a Provider
• Publicizing Your Web Pages
• Personal and Hobby Home Pages
• Search Engines
• Indexing Tips
• Indices of Meta Web Search Engines
• Hiding Your Site

Some Review Project Ideas ...

• Implement a simple web page (use meta tag, lists, tables, color and images)
• Demonstrate a couple of HTML advanced features (frames, animations, forms)
• Demonstrate CGI scripts usage, embedded objects, CSS, scripting, and objects
• Experiment with various tools
  – HTML and Style Sheet Editors, CGI Software, and utilities