HTML

CSCI311

Learning Objectives

- Review html
- Learn to write a basic webpage in html
- Understand what the basic building blocks of html are

HTML: Hypertext Markup Language

- HTML5 is new standard that replaces previous versions of HTML
- *elements* are used to structure the page content
  - e.g., <h2> second-level header, <p> paragraph
- markup language:
  - tags are added to content to give it structure
- open tag <xyz>
- closing tag </xyz>
- self-closing tag <xyz />
- tags are always surrounded by < >

Basic structure of HTML file

```
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" lang="en">
   <head>
      <meta charset="utf-8"/>
      <title>Basic Web Page</title>
      <!-- other head stuff -->
   </head>
   <body>
      <!-- page content here -->
   </body>
</html>
```

HTML elements

- over 100 different html elements
- meta information is placed in the head element
- content information is placed in the body element
- Two main kinds of element:
  - flow elements (or block)
  - phrasing element (or inline)

Classifying HTML elements

- top-level elements: html, head and body
- head elements: placed inside the head
  - title
  - style
  - link
  - meta
  - base
  - script
- do not display on the page

Classifying HTML elements

- block-level elements
  - flow elements that behave like paragraphs
  - occupy 100% of available width
  - stacked vertically with preceding and subsequent block elements
    - article, h1-h6, header, footer, section, p, figure, canvas, pre, div
    - ul, ol, dl, table, form, video

Classifying HTML elements

- inline elements
  - phrasing elements that behave like words
  - flow horizontally
  - usually placed inside block elements
    - a (anchor), audio, br, code, img, em, nav, samp
    - span, strong, sub, sup, time, var

Syntax of HTML

- All tags begin with < and end with >
- tag name is given immediately following opening <
- unrecognized tags are ignored
- *attributes* are given following the tag name:
  - <tag attribute1="value" attribute2="value" ...>
  - ' can be used instead of "
  - forgetting to close a quote can result in a blank page
- *names* and attributes are lowercase
- *values* are case sensitive
- attributes that have boolean values:
  - true: attribute_name="attribute_name"
  - false: attribute_name=""

Syntax of HTML

- unrecognized tags and attributes are ignored
- elements without closing tags are of the form <img />
  - ending / is optional for HTML5, needed for polyglot documents
- elements must be well-formed
- no bad nesting
  - <p>Stuff <strong></p></strong>
- attributes can be in any order
- white space is allowed
  - between tag name and attributes
  - around the = sign
  - within attribute value (but should be avoided)
- body element may only directly contain block elements
  - no free-stranding text
  - no inline elements

HTML core attributes

- All HTML5 elements can have the following:
  - id – uniquely identifies an element in the page
  - style – gives presentation style
  - class – style class, or space-separated list of style classes
  - title – title for the element. Can be used as tool-top display
  - hidden – prevents element from being displayed when set to true
  - contenteditable, draggable, dropzone, spellcheck, and more

Typical Webpage Architecture

- In detail we will look at:
  - Headings and Paragraphs
  - White space and line wrapping
  - presentation styles
  - lists
  - links
  - navbars
  - images
  - layout
  - validation

Headings and Paragraphs

- Six heading levels: h1-h6
  - block elements
- paragraph element: p
  - can contain text and phrasing elements
  - typically has a new line before and after
  - lines wrapped to fit width
  - extra white space in text ignored
- break element: <br /> can be used to insert blank line
- line break opportunity: <wbr /> can be used to break up long-running text like urls and emails

Headings and Paragraphs

- inline (phrasing) elements can be placed in a paragraph
  - em
    - emphasis
  - q
    - quote
  - mark
    - highlight
  - strong
    - like bold
- paragraphs and headings are left aligned by default

White Space and Wrapping

- in HTML white space separates text into words
    - space (ASCII 32, entity &#x0020;)
    - tab (ASCII 9, entity &#x0009;)
    - formfeed (ASCII 12, entity &#x000C;)
    - zero-width space (entity &#200B;)
- whitespace collapsing
    - only one white space is rendered between characters
- line-breaking white space entities
    - return (ASCII 13)
    - newline (ASCII 10)
    - only linebreak the code, not the content

White Space and Wrapping

- Only whitespace separates words:
  - tags don’t
    - e.g., <p>The HTML<strong>5</strong> standard.</p>
    - Yeilds: The **HTML5** standard
- to force a line break:
  - <br />
- to force two words to stay on a line:
  - non-breaking white space: &#xA0; or &nbsp;
- to indicate where a word can be broken across a line with a hyphen:
  - soft hyphen: &shy;
- to indicate where long words can broken across a line without a hyphen:
  - <wbr />

Phrasing (inline) elements

- link: a
- line break: br
- citation: cite
- emphasis (usually italics): em
- strong emphasis (usually bold): strong
- stronger emphasis (usually highlight): mark
- computer code: code
- deleted words (crossed out): del
- subscript: sub
- superscript: sup
- sample computer output: samp
- general phrasing element that can contain other phrasing elements: span

Presentation Styles

- To add non-default presentation style we use *style rules*
- Three ways:
  1. place rules in a style sheet
  2. include <style> elements in the head element
  3. use the style attribute for individual elements

```
<h1 style="color: darkgreen">This is Green</h1>
```

- style attribute takes precedence over styles in the style element
- style element takes precedence over style sheets

Some style properties

- foreground colour
  - color
- background colour
  - background-color
- text alignment
  - text-align
  - e.g., text-align: left – left justified
- font size
  - font-size
  - e.g., font-size: x-small
- indentation
  - text-indent
  - e.g., text-indent: 3em
- margin
  - margin-left: *length*
  - margin-right: *length*

Style Length Units

- relative lengths:
  - em: font-size of the current font
  - ex: the x-height of the current font
  - ch: the size of 0 in the current font
- absolute lengths (avoid)
  - cm: centimeters
  - in: inches
  - mm: millimeters
  - pc: picas (1pc = 12pt)
  - pt: points (1pt = 1/72in)
  - px: pixels (1px = 1/96in)
  - not sensitive to resolution, or font size

Colours

- There are a number of ways to specify colours
- by name
  - e.g., red, green, magenta
  - ~150 colour names in CSS
  - w3.org/TR/css3-color/#rgba-color
- by rgb value:
  - #rrggbb
  - #rgb
  - rgb(r, g, b) – base 10 numbers between 0 and 255
  - rgb (r%, g%, b%)
  - rgba (r, g, b, a) a is alpha, ranging from 0 to 1
  - rgba (r%, g%, b%, a)
- hsl (hue, saturation, light)
  - hsl(h, s%, l%) h is degrees 0 – 360
  - hsla(h, s%, l%, a)

Font

- font-family property lets you set font
  - e.g., font-family: Times
- can list more than one font
  - e.g., font-family: Arial, Helvetica, sans-serif
- always good to list a generic font family last, in case fonts are not found on host
- multi-word font family names enclosed single or double quotes

Font

- font-weight property controls how heavy font is
  - e.g., font-weight: bolder
- font-size property controls size of font
  - to a specific size
    - e.g., font-size: small
  - to an absolute size
    - e.g., font-size: 16pt
  - relatively
    - e.g., font-size: smaller (or percentage)

Lists

- Three kinds of list in html5:
  - bullet list
    - ul element
  - ordered list
    - ol element
  - definition list
    - dl element
    - each term <dt> is given a definition <dd>
    - dt element can contain inline elements
    - dd element can contain inline and block elements
- ul and ol can only contain list elements
  - li
- li can contain block elements like paragraphs, headings and other lists

List styles

- Default list item marker for ul and ol is browser-dependent
- list-style-type property lets you customize list:
  - e.g., <ul style="list-style-type: circle"> ... </ul>
  - e.g., <ol style="list-style-type: upper-alpha"> ... </ol>
- style types include:
  - disc, circle, square, none, decimal, lower-roman, lower-alpha...
  - you can make an ul numbered
  - you can make an ol with bullets
- list-style-image: url(*imageURL)* lets you customize bullet with an image
- list-style-position
  - value outside or inside

Links

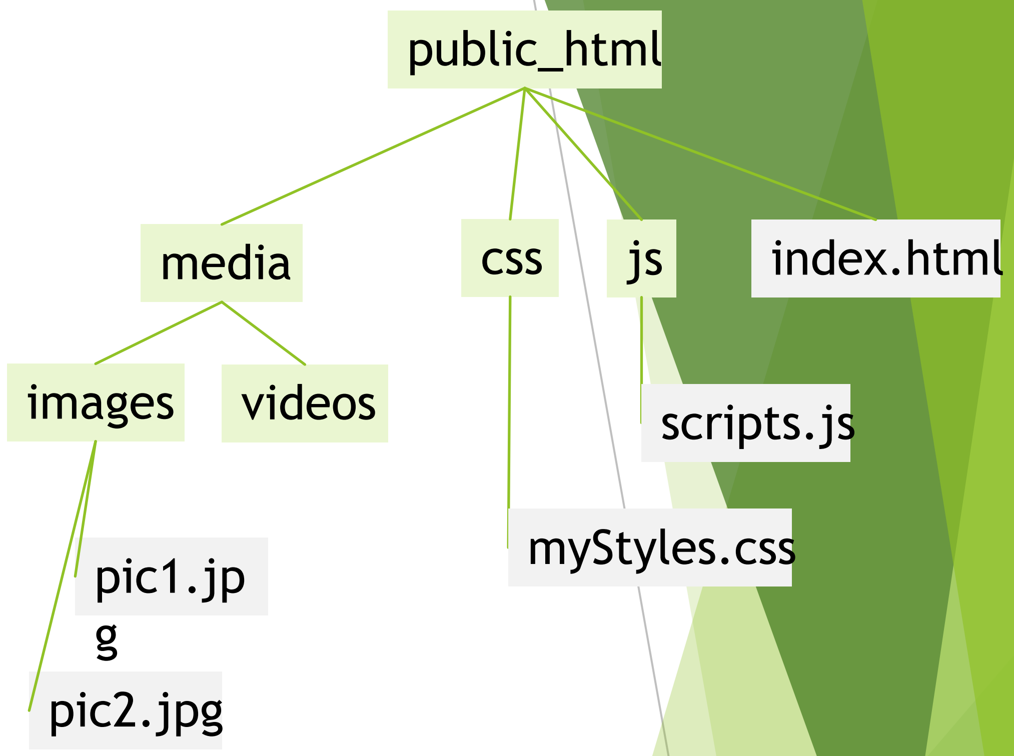
- anchor tag: a
  - e.g., <a href=“URL”>anchor</a>
- anchor can be: text, image, button, video
- link can also be attached to part of an image map
- links can be to
  - other web pages
    - e.g., <a href=“http://viu.ca”>VIU</a>
  - local files (using relative paths)
    - e.g., <a href=“../pics/dog.png”>Doggy</a>
  - to parts of an html document (using the id attribute)
    - e.g., <a href=“#products”>Products</a>

Links

- When opening external links (outside your site) it is good practice to open link in separate browser window
  - <a href=“http://www.w3.org/” target=“_blank”>The W3C Consortium</a>
- Make it clear that click will leave your site:
  - placement of link in sidebar

Site Organization

- Place home file (usually index.html) in root directory
- use directories to organize files:
  - images/, videos/, css/, js/, products/, services/
  - an index.html within each of these directories can be used as the lead page for that heading
- keep organization simple
  - no more than depth 3
  - make sure navigation is simple and straightforward for user



public_html

media

css

js

index.html

images

videos

scripts.js

myStyles.css

pic1.jp
g

pic2.jpg

Linking to services

- to email
  - <a href=“mailto:*email-address?*SUBJECT=*line*”>
  - e.g., <a href=“mailto:sarah.carruthers@viu.ca?SUBJECT=Very%20Important%20Stuff”>contact Sarah</a>
    - note use of %20 to include spaces in subject line
- Download links:
  - <a href=“ftp://*host:port/path-to-file*”>
- Telephone/SMS/Fax:
  - <a href=“tel:*phone_number*”>
  - <a href=“sms:*phone_number*”>
  - <a href=“fax:*phone_number*”>
- VOIP
  - <a href=“callto:*screen_name* or *phone_number*”>

Navbars

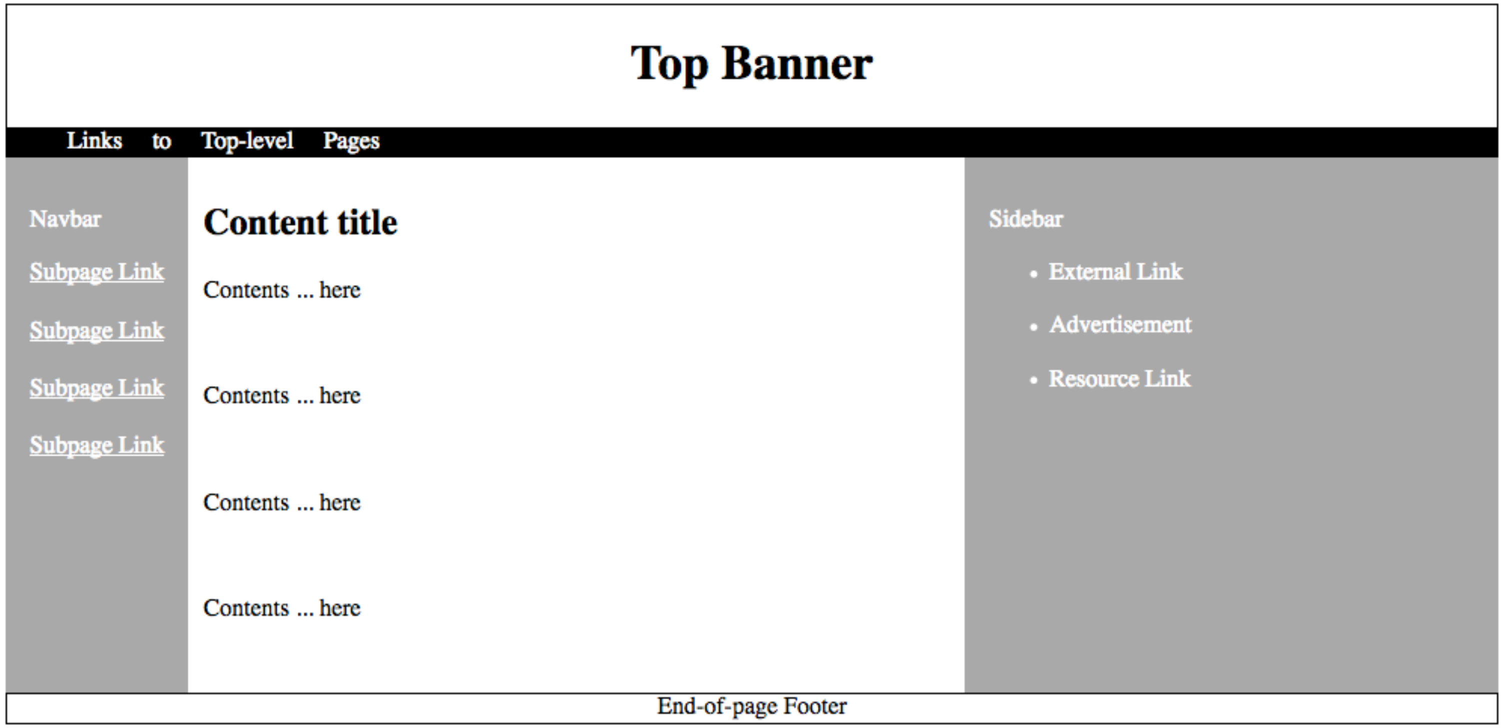
- Common to have horizontal and vertical navbars
- Main navigation commonly on horizontal
- Secondary navigation in vertical
- nav element creates navbars
- We will revisit this, including side nav and styling later

Images

- To include an image in a page:
  - <img src="hat.jpg" alt="A nice hat" style="width:160px; height:200px" />
    - self closing tag
    - src attribute gives URL to download image to be displayed
    - it replaces the img tag in content of page
    - **do not hot link images**
    - alt tag is **required**, gives alternate text (not tool tip)
    - optional height and width attributes
      - best practice is to make sure it matches original, or very close to it
- To make a clickable image link
  - place an image tag in the anchor of <a>

Layout

- Come up with a clear and consistent layout
- Make sure important things are easy to find



Debugging and Validation

- After you’ve written your code:
  - spell check
  - test with many browsers
  - test on different platforms
  - test on different screen size/resolution
    - can be done within browser too, but best to also test on devices
  - Test all links
    - validator.w3.org/checklink
  - Use a validator:
    - validator.w3.org for HTML
    - jigsaw.w3.org/css-validator for CSS

Summary

- HTML is used to structure content
- We’ve seen a number of different kinds of elements
- Block and inline elements
- Basic structure and contents of a web page