CSS and Intro to JS

Slides created in conjunction with: Ilchul Yoon, Nelson Padua Perez

Agenda

- CSS Selectors Wrap Up
- Box Model
- Background Colors
- Fonts
- Intro to JS

Exercise to do at home

Draw out DOMExample.html’s DOM tree!

Kinds of Selectors

- Descendant selector
  - Override the type, class and id selector styles
  - Typically with two elements where the second is a descendant

- Examples

```
li a {font-size: 2em}

#header h2 {font-weight: normal;}

#content h2 {font-weight: bold;}
```

Kinds of Selectors

- Universal selector
  - Applies to all elements in context
  - Example: * {font-family: arial, Helvetica; }

- Pseudo-elements
  - Allows you to style an item that is not marked by elements
  - Two pseudo-elements :first-letter, and :first-line

Child Selectors

- A child selector matches when an element is the child of some element. A child selector is made up of two or more selectors separated by ">".
- Example

```
body > p { line-height: 1.3; }
```

sets the style of all p elements that are children of body:

```
div ol > li p { color: tan;}
```

What does this do?

Adjacent Sibling Selectors

- The selector matches if E1 and E2 share the same parent in the document tree and E1 immediately precedes E2, ignoring non-element nodes (such as text nodes and comments)
- Syntax: E1 + E2, where E2 is the subject of the selector
- Example

```
th + p { text-indent: 0 }

h1 + h2 { margin-top: -5mm }
```

Attribute Selectors

- Match elements which have certain attributes defined in the source document
- Syntax:
  - [att] - For when the element sets the att attribute, value doesn't matter
  - [att=val] - For when the attribute is set to val specifically
- Examples:

```
h1[title] { color: blue; } //<h1 title = “heading”>

span[class=example] { color: blue; }
```

Other Examples

- a[title] { }
- .myPrefStyle{ }
- #mySchedule { }
- div.myPrefStyle{ }

Other Examples

- a[title] { }
  - Anchor elements with a title attribute
- .myPrefStyle{ }
  - Any elements with the class myPrefStyle (same class name can appear in many elements)
- #mySchedule { }
  - An element with id mySchedule (only one element on the page)
- div.myPrefStyle{ }
  - A div with the class myPrefStyle

Other Examples

- div#mySchedule{ }
- div table { }
- input[type = “submit”] { }

Other Examples

- div#mySchedule{ }
  - A div with the id mySchedule
- div table { }
  - A table with a div ancestor
- input[type = “submit”] { }
  - An input element with a type attribute that has the value submit

Box Model

CSS Box Model

- Refers to margin, border, padding and content HTML element components
- Allows us to define space between elements
- Cheat Sheet:
  - Content: What lies in the middle of the box
  - Padding: What immediately surrounds the content
  - Border: Surrounds the padding and represents the border of the box
  - Margin: Surrounds the border

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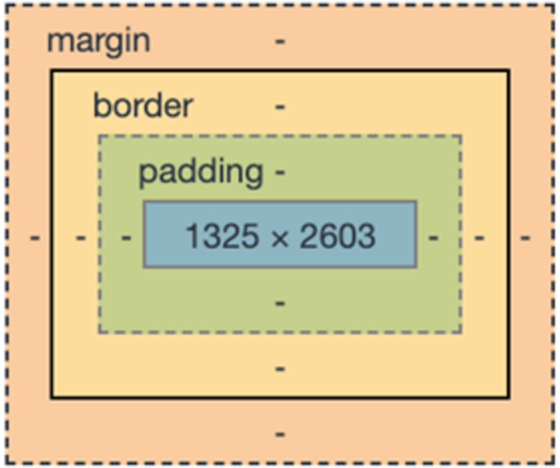

Pro Tips for Box Model

- You may adjust the individual padding/margin properties:
  - padding-bottom, padding-left, padding-top, padding-right
  - margin-bottom, margin-left etc.

- Margin, border, padding and background are not inherited properties (children will reset)

Want to save time? Use Shorthand Properties

Instead of listing out each property in seperate lines, you may use any of the following tags, with values separated by a space:

- background
- font
- border
- margin
- padding

Example: shorthandProperties.html/CSS

Background Properties

- background-color
- background-image: location (url) of image
- background-repeat: how image repeat
  - Possible values for repetition

no-repeat	: one instance of the image
repeat	: tile
repeat–y	: repeats on the y-axis
repeat–x	: repeats on the x-axis

- background-attachment :
  - indicates attachment of the image to the containing element.
  - Possible values are:
    - scroll : default value
    - fixed : image will stay stationary as the scrolling takes place

Background Properties

Example: background.html/css && backgroundStretch.html/css

- Background-position
  - Possible values (some combinations are valid)
    - top, bottom, center, left, right
- Background-size
  - Possible values
    - auto auto - rertaims the original size
    - 000px 000px
    - x% y%
    - contain | cover | …
- Background images can be used in elements other than body (e.g., div)
  - There is a shorthand property for backgrounds
    - background: lightblue url("campusBldg.jpg") no-repeat fixed center;

Generic Font Families

- **serif**: Times New Roman, Georgia, Times, …
- **sans-serif**: Verdana, Helvetica, Arial, …
- **monospace**: Consolas, …
- **cursive**: *Lucida Handwriting*, …
- **fantasy**: Comic Sans MS, …

Take a look at background.html for an example

Choosing Fonts

- Specify a particular font
  - font-family: arial;
  - Works if the font is available on user’s machine
- Specify a generic family
  - font-family: serif;
  - Choices include: serif, sans-serif, monospace, cursive, fantasy
- specify a list of fonts
  - will be attempted in order
  - font-family: foobar, arial, sans-serif;

Google Fonts

- Google supports a set of nice fonts anyone can link in HTML docs

- https://fonts.google.com/
- Choose fonts and put a link in HTML
- Use the fonts with “font-family” CSS property

WTWAW (What To Walk Away With)

Make sure you know:

- Use various types of selectors (namely type, class and id)
- Change the background using CSS
- Use different Fonts
- Explain what the box model (and it’s elements are)

JavaScript!

JavaScript

- Finally some programming!

- JavaScript is a programming language that allows us to:
    - Create interactive web pages
    - Control a browser application
        - Open and create browser windows
        - Download and display contents
    - Interact with the user
    - Interact with HTML Forms
    - And so much more!

JS and ECMAScript

- JavaScript implements ECMAScript

What is ECMAScript?

- A scripting language standard
- ActionScript and JScript are other implementations

How is JavaScript different?

JavaScript implementation includes:

- ECMAScript
- DOM (Document Object Model)
- BOM (Browser Object Model)

JavaScript Engine

Example: templateJS.html

- JavaScript engine process JavaScript code
  - Safari: JavaScriptCore
  - Chrome: V8
  - Firefox: Spidermonkey
  - Edge: Chakra
- To write JavaScript programs you need a web browser and a text editor
- A JavaScript program can appear:
  - In a file by itself typically named with the extension .js
  - In html files between a <script> and </script> tags.

What is “use strict”?

- JavaScript's strict mode, introduced in ES5
- A way to opt in to a restricted variant of JavaScript, thereby implicitly opting-out of "sloppy mode".
- Several changes to normal JavaScript semantics:
  - Makes JavaScript silent errors throw errors
  - Prohibits some syntax likely to be defined in future versions of ECMAScript.
- Examples not allowed
  - Declaring function in blocks if (a < b) { function f() {} }
  - Setting a value to an undeclared variable

Processing HTML with JS

- DOM – Document Object Model
  - Structured representation of the HTML page
  - Every HTML element is represented as a node
  - Browser uses HTML to build the DOM and can fix problems with the HTML so a valid DOM is generated

- Lifecycle
  - Set the user interface
    - Parse the HTML and build the DOM
    - Process (execute) JavaScript code
  - Enter a loop and wait for events to take place

Processing HTML with JS

- When JavaScript is seen in a page, the DOM construction is halted and JavaScript code execution is started.

- JS can modify the DOM (e.g., creating, modifying nodes)
    - One reason why <script></script> elements appear at the bottom of a page (speed)

Event Handling

- Relies on a single-threaded execution model
- An event queue keeps track of events that have taken place, but have not been processed (event-handler function for the event has not been called)
- All generated events (whether are user-generated or not) are placed in the event queue in the order they were detected by the browser
  - The browser mechanism that detects events and that adds them to the event queue is separate from the thread that is handling the events

Browser’s Global Objects

- Browsers provide two global objects: window and document
- window object – represents the window in which a page resides
  - Provides access to other global objects (e.g., document)
  - Keeps track of user’s global variables
  - Allows JavaScript to access Browser’s APIs
- document object
  - Property of the window object that represents the DOM of the current page
  - Via this object you can access & modify the DOM

Types of JavaScript Code

- Function Code
    - Code contained in a function
- Global Code
    - Code placed outside all functions
    - Automatically executed by JS engine
- As in Java, a stack is used to keep track of function calls. Each function call generates a function execution context (stack frame)
- There is one frame called the global execution context created when the JS program starts executing.

WTWAW

After today make sure you know:

- What is JavaScript?
- How does JS fit in with the DOM?
- What is the JavaScript LifeCycle?
- How does JS handle events?