

# CMSC335

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## Web Application Development with JavaScript



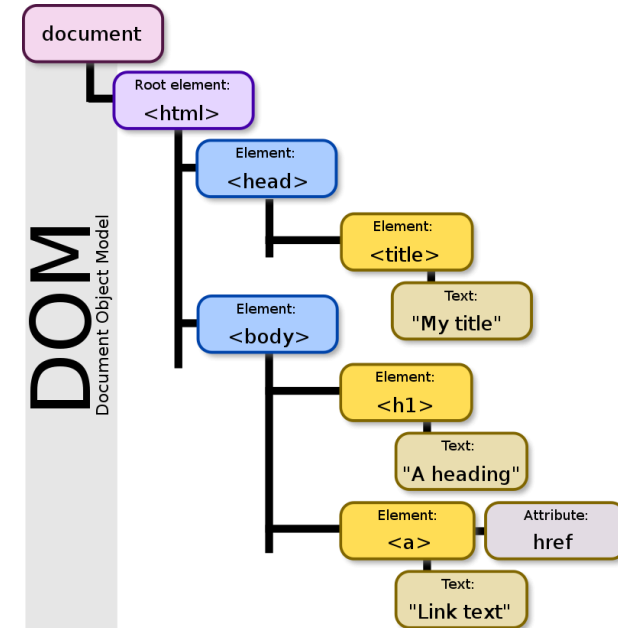
## CSS

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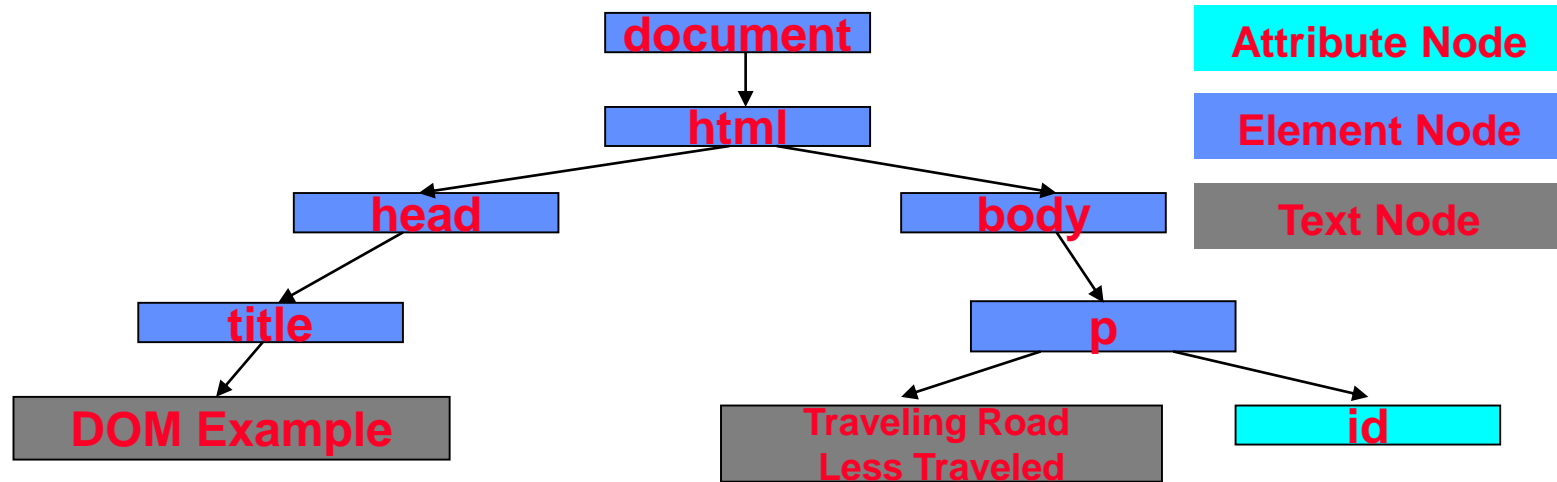
# DOM (Document Object Model)

- A cross-platform and language-independent **programming interface** for HTML and XML documents
- Represents a document with a logical tree wherein each node is an object representing a part of the document
- Each branch of the tree ends in a node, and each node contains objects
- Allow programmatic access to the tree
  - DOM allows changes to the structure, style or content of a document
  - Nodes can have event handlers attached to them. Once an event is triggered, the event handlers get executed



Source: Wikipedia

# Example DOM for HTML File



```
<html>
  <head><title>DOM Example</title></head>
  <body>
    <p id="message">Traveling the road less traveled. </p>
  </body>
</html>
```

- Html – root element
- head – child of html
- Head and body - siblings

# CSS (Cascading Style Sheets)

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- Official W3C standard **for controlling presentation**
- Style Sheets
  - Text file with rules. It includes no html
  - Style sheets files use a **.css** extension
  - Allows you to apply typographic styles (font size, line spacing, etc.)
  - Allows you to apply spacing instructions
  - Allows you to have page layout control
  - Smaller html files by avoiding redundancy in style specification
  - Easy update a collection of pages by updating only a single file
- **Example:** ExternalFile.css
- Why CSS?
  - <http://www.csszengarden.com/>

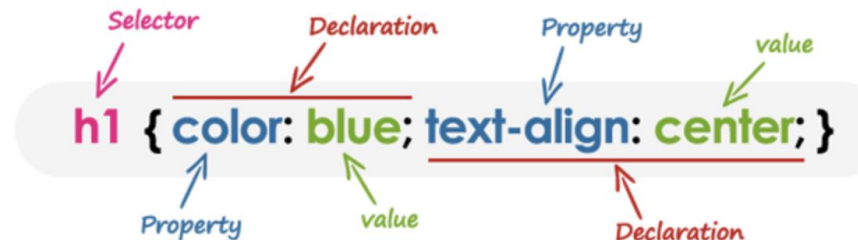
# CSS

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- Rule
  - Basic element of a style sheet
  - **Describes the formatting associated with a page element**
- Rule format

## selector declaration block

- Selector: identifies what should be styled in a web document
  - e.g., h1, p
- Declaration block: describes styling information (what and how that portion of the web document should be modified).
- Declaration: property/value pair



# CSS

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- Declaration: consists of **property: value pair(s)** enclosed in { }
- **Example:**

```
p {  
    font-size: 2em; color: red;  
}
```

- Popular properties
  - color, font-family, font-size, text-decoration, ...
- CSS Properties
  - <http://www.w3schools.com/cssref/>
- Comments: Surrounded by /\* \*/
  - You may use them to disable styles
- **Example:** ExternalFile.css

# Types of Style Sheets

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- **Inline**
  - Style information applied to specific tag (e.g., `<p style=..."`)
  - Avoid if possible
- **Internal**
  - Using the `<style>` tag in the header of the html document
  - Convenient to provide own style to a specific page
- **External**
  - External style sheet which web pages link to (see `<link>` tag)
  - Preferred approach
- **Example:** InternalStyle.html, ExternalFile.html, ExternalFile.css

# CSS Validator

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- <http://jigsaw.w3.org/css-validator/>
- Notice you have three choices
  - By URI
  - By File Upload
  - By direct input
- Look at the “More Options” section



# Colors

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- You can specify colors using one of the following predefined colors (e.g., **yellow, white, red, purple, blue**)
- You can specify a color by indicating the red, green and blue components. For example, all the following are equivalent:
  - Red
  - `rgb(255,0,0)`
  - `#ff0000` or `#f00` (shorter, obviously cannot use for all colors)
- RGBA adds alpha channel that allows us to specify the opacity for a color
  - RGBA color specification: `rgba(RED, GREEN, BLUE, ALPHA)`
  - Alpha value of 0 (transparent), Alpha value of 1.0 (opaque)
    - » **Example:** `rgba(125, 125, 125, 0.5);`
- References:
  - [http://www.w3schools.com/css/css3\\_colors.asp](http://www.w3schools.com/css/css3_colors.asp)

# Setting Size

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- Length units - centimeters (cm), millimeters (mm), etc.
- Whitespace cannot appear between number and the unit
- Two types of length units:
  - **Relative** (e.g., em, rem)
  - **Absolute** (e.g., cm, pc)
- Relative
  - **ex**: height of the lowercase x in the font
  - **em**: Relative to the size of the current font
    - » 3em: 3 times size of current font
  - **Rem (“root em”)**: relative to the size of the font of the root element
    - » **rem** is constant throughout a document
  - <http://www.sitepoint.com/power-em-units-css/>
- Preferred: relative and percentages
- **Viewport**: browser window size
- [http://www.w3schools.com/cssref/css\\_units.asp](http://www.w3schools.com/cssref/css_units.asp)
- <https://www.w3.org/Style/Examples/007/units.en.html#units>

# Property inheritance

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- Inheritance of Properties:
  - A child element inherits the same properties of its parent element (unless otherwise indicated by the CSS specification)
- Examples of inherited properties
  - color, font-family, font-size, letter-spacing, ...
- Examples of non-inherited properties
  - border, margin, padding, ...
- **Example:** PropInheritance.html, PropInheritance.css

# Kinds of Selectors

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- **Type Selectors:**
  - Based on the name of an HTML tag (e.g., p, table, etc.)
  - **p** { color: red; }
- **Pseudo-classes:**
  - Attached to selectors to specify a state. Four popular pseudo-classes are
    - » **a:link**: initial color of a link
    - » **a:visited**: color for a visited link
    - » **a:hover**: color when mouse hover over link
    - » **a:active**: color during the clicking of the link
    - » Order is important (**LoVeHAte**)
- **Example:** Selectors.html, Selectors.css

# Kinds of Selectors

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- **Class Selectors:**
  - Allow us to apply the same rules to a set of elements
  - Use when you need to apply a style many times in your document
  - Created with a period (also known as full stop)
- **ID Selectors:**
  - Similar to class selectors but appear only once in the document
  - Used when you need to apply a style only once in your document
  - Created using #
- **Example:** Selectors.html, Selectors.css

# Kinds of Selectors

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- 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;}`
- **Example:** DescendantSelector.html, DescendantSelector.css

# Kinds of Selectors

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- Pseudo-elements
  - Allows you to style an item that is not marked by elements
  - pseudo-elements **:first-letter**, and **:first-line**
- Universal selector
  - Applies to all elements in context
  - Example: `* {font-family: arial, Helvetica; }`
- **Example:** PseudoElementsUniv.html, PseudoElementsUniv.css

# Child Selector

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- 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 ">"

- **Examples:**

**body > p { line-height: 1.3 }**

» Sets the style of all p elements that are children of body

**div ol > li p**

» Combines descendant selectors and child selectors

» Matches a **p** element that is a descendant of an **li**; the **li** element must be the child of an **ol** element; the **ol** element must be a descendant of a **div**. Notice that the optional white space around the ">" combinator has been left out



# Adjacent Sibling Selectors

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- 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
- **Examples:**

**math + p { text-indent: 0 }**

» When a **p** element immediately follows a MATH element, it should not be indented

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

» Reduces the vertical space separating an **h1** and an **h2** that immediately follows it

# Attribute Selectors

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- Match elements with certain attributes defined in the source document
- **Syntax**
  - **[att]** Matches when the element sets the "att" attribute, whatever the value of the attribute
  - **[att="val"]** Matches when the element's "att" attribute value is exactly "val"
- **Examples:**
  - h1[title] { color: blue; }**
    - » Matches all **h1** elements that specify the "title" attribute, whatever its value
  - span[class="example"] { color: blue; }**
    - » Matches all **span** elements whose "class" attribute has exactly the value "example"

# More Selector Examples

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- **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
- **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

# Wrap-up

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- After this class, students should be able to:
  - Explain why we use CSS
  - Understand the basic CSS rule structure (selector + decl)
  - Use CSS rules in 3 different ways
  - Use colors in HTML docs in multiple ways
  - Use relative and absolute length units
  - Put comments for CSS rules
  - Explain what DOM is
  - Use various selector types (type, class, id, ...)