CSS
Overview

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CSS Basics

- Stands for Cascading Style Sheets

- HTML provides structure
- JavaScript provides behavior to your HTML document
- CSS provides the presentation to your HTML document

- Provides the tool to design and create great looking web apps

- CSS Goals
  - Create a consistent look across many web pages
  - Separate structure from presentation, so you can provide different style sheets for printing, browsing, or other scenarios

CSS Basics

- Style
  - Is a rule that describes how to format a specific part of an HTML document
- Style Sheet
  - Is a set of style rules
- Selector
  - A style can be applied to many elements based on a selector
  - Used to locate and select elements based on tag name, class name, element id, etc.
  - The idea is reuse styles across elements and pages

Defining Styles

- Defining and applying a style
  - A style is composed of two parts
    - ***Selector*** – locates the elements in the HTML document that will be styled
    - ***Declaration block*** – contains the formatting instructions or declarations
      - Multiple declarations are separated with a semicolon
      - A declaration takes the following form
        - ***<css-property>: <value>***

```
selector {
  property: value;
  anotherProperty: value;
}
```

Defining Styles

- Adding comments
  - Comments can be added within a style sheet by using /* and */
  - /* characters start the comment
  - */ characters end the comment
  - Comments may span multiple lines

Defining Styles

- Creating an inline style
  - The global attribute called ‘style’ can be used to provide an inline style
  - Since an inline style is defined on the element to which you wish to add styling, selector is not needed; just declaration block is enough

```
<ul>
  <li style="color: red;">Get vegetables</li>
  <li style="color: red;">Buy milk</li>
</ul>
```

  - Avoid this technique because
    - It violates the goal of separation between structure and presentation
    - No reusability

Defining Styles

- Creating an embedded style
  - <style> element can be used to create an embedded style sheet within your HTML document
  - CSS selectors must be used to assign the style definitions to elements on the page
  - The <style> element is specified within <head> element
  - Any number of style rules can be defined within <style> element
  - Avoid this technique because,
    - It does not provide file separation
    - It does not promote reuse across HTML documents

```
<html>
<head>
  <style>
    body {
      background-color: white;
      color: gray;
    }
  </style>
</head>
...
</html>
```

Defining Styles

- Creating an external style sheet
  - The ideal approach is to create an external style sheet file
  - This file should then be linked to pages using <link> element

```
<html>
  <head>
    <link rel="stylesheet" type="text/css" href="./default.css" />
  </head>
  ...
</html>
```

```
/* default.css */
body {
  background-color: white;
  color: gray;
}
```

  - Attributes
    - rel – specifies the relationship between HTML document and external CSS file
    - type – specifies the MIME type of external CSS file
    - href – specifies the relative location of external CSS file

Defining Styles

- Creating an external style sheet (Continued)
  - A style sheet file can have as many style rules as needed
  - More than one external style sheet files can be linked to an HTML document using <link> tag

  - Using ‘media’ attribute
    - The <link> element has a media attribute that can specify the target device
    - You can create a CSS file for each device and link all CSS files into the HTML document
    - When the HTML document is rendered, the browser determines the media type and uses the appropriate CSS file

```
<link rel='stylesheet' type='text/css' href='./screen.css' media='screen' />
<link rel='stylesheet' type='text/css' href='./print.css' media='print' />
```

Defining Styles

- Creating an external style sheet (Continued)
  - Imported style sheets from other style sheets
    - The @import rule enables you to import a CSS file into another style sheet file

```
@import url('./header.css');
@import url('./menu.css');

body {
  background-color: white;
  color: gray;
}
```

    - ***Note:*** @import rules must be at the top of the style sheet

CSS Colors

- Colors can be specified in several ways
  - Color names
    - Built-in colors, HTML supports 140 standard color names
    - https://htmlcolorcodes.com/
    - http://colours.neilorangepeel.com/
  - Hexadecimal
    - # + String of 6 Hexadecimal numbers (from 0 to F)
      - #800080 – for purple
      - #FFFFF0 – for ivory
    - More choices, keeping the names of colors short
    - https://www.webpagefx.com/web-design/color-picker/
  - rgb()
    - 3 channels: Red, Green, and Blue. Each ranges from 0 to 255
      - rgb(0, 255, 0)
      - rgb(100, 0, 100)

CSS Colors

- rgba()
  - Similar to rgb(), but with an alpha (transparency) channel that ranges from 0.0 to 1.0
    - rgba(11, 99, 150, 1)
    - rgba(11, 99, 150, 0.6)
    - rgba(11, 99, 150, 0.2) /* more transparent */

- hsl()
  - A color can be specified using hue, saturation, and lightness (HSL) in the form

```
hsl(hue, saturation, lightness)
```

    - Hue is a degree on the color wheel from 0 to 360. 0 is red, 120 is green, and 240 is blue
    - Saturation is a percentage value, 0% means a shade of gray, and 100% is the full color
    - Lightness is also a percentage, 0% is black, 50% is neither light or dark, 100% is white

Color & Background

- Use
  - ‘color’ to set text color
  - ‘background-color’ to set background color

```
p {
  color: tomato;
}

h1 {
  background-color: DodgerBlue;
}
```

  - ‘background-image’ specifies an image to use as the background of an element

```
body {
  background-image: url(‘paper.gif’);
  background-repeat: no-repeat;
  background-size: cover;
}
```

Borders

- ‘border-color’ property is used to set the color of the four borders
- ‘border-style’ property specifies what kind of border to display
- ‘border-width’ property specifies the width of the four borders

```
p {
  border-width: 5px;
  border-style: solid;
  border-color: red;
}
```

- ‘border’ property is a shorthand property for the following individual border properties:
  - border-width
  - border-style (required)
  - border-color

```
/* Border - Shorthand Property
p {
  border: 5px solid red;
}
```

Borders

- ‘border-radius’ property is used to add rounded borders to an element

```
p {
    border: 2px solid red;
    border-radius: 5px;
}
```

CSS Selectors

- A selector can be one of the following:
  - Element selector
  - Id selector
  - Class selector

- Element selector
  - Is based on the name of the tag
  - Select all instances of a given element

```
li {
    border: 2px solid red;
}
```

CSS Selectors

- Id selector
  - Is based on the id of the element
  - Usually prefixed with the hash (#) symbol
  - Selects an element with a given id
  - Id must be unique across the HTML document, and hence this approach limits the reusability on a page

```
#special {
    background-color: yellow;
}
```

- Class selector
  - Is a style with a class name of your choice
  - Prefixed with the period (.) symbol
  - Also called a named style
  - Class name can be assigned to any element using the class attribute
  - Promotes reuse

```
.completed {
    text-decoration: line-though;
}
```

Advanced Selectors

- Universal selector
  - If you want to apply a style to every element, you can use asterisk (*) symbol
  - Avoid using the universal selector because of the performance cost

```
* {
  border: 1px solid lightgrey;
}
```

- Descendant selector
  - You might want to change the style of elements only if the elements are descendants of another element

```
li a {
  color: red;
}
```

  - “li a” is called a ‘selector chain’
    - A group of selectors that specify a path to the element that interest you
    - Specifies an ancestor element, followed by a space, and then the descendant element
    - The descendant element can be a child, grandchild or distant descendant

Advanced Selectors

- Child selector
  - You might want to change the style of elements only if the elements are direct children of another element
  - You can do this by specifying a parent element, followed by a greater-than symbol (>) and then specifying the child element

```
li > a {
  color: red;
}
```

- Adjacent selector
  - Can be used to select an element if it is preceded by a specific element
  - The plus sign (+) denotes an adjacent selector

```
h4 + ul {
  border: 4px solid red;
}
```

Advanced Selectors

- Attribute selector
  - Selects elements based on the existence of the specified attribute
  - For e.g., a[title] selects all hyperlinks whose title attribute is defined

- Attribute value selector
  - Selects all elements where the specified attribute has the specified value

```
a[href="http://www.google.com"] {
  background-color: blue;
}
```

- nth-of-type(n) selector

```
li:nth-of-type(odd) {
  background-color: yellow;
}
```

  - Selects every <li> element that is the second <li> element of its parent

Specificity

- Inheritance
  - An element can get its style from a parent when no other styles are defined that are more specific
- Specificity
  - Is the means by which browsers decide which CSS property values are the most relevant to an element and, therefore, will be applied
  - Certain times, there could be multiple styles that would impact a single element
  - In such scenario the CSS has to decide which one wins
  - Whatever style is closest to the element, i.e., whichever style is more specific, it wins and is considered

Specificity

- The following list of selector types increases by specificity:
  - Type selectors and pseudo-elements
    - E.g. h1, ::before
  - Class selectors, attributes selectors and pseudo-classes
    - E.g. .header, input[type="radio"], :hover
  - ID selectors
    - E.g. #example

- ***Note***
  - Inline styles added to an element (e.g., style="font-weight:bold") always overwrite any styles in external stylesheets, and thus can be thought of as having the highest specificity

Fonts & Text

- ‘font-family’ property can be used to set the typeface of the elements that match the selector

```
p {
  font-family: arial;
}

h1 {
  font-family: “times new roman”, serif;
}
```

- ‘font-size’ property can be used to set the size of the font
  - Font sizes can be specified by using
    - Absolute units – useful when the output environment is known
    - Relative units – size is based on the parent element’s size

```
h1 { font-size: 12px; }
h1 { font-size: 1in; }
h1 { font-size: 1.2em; }
h1 { font-size: 150%; }
```

Fonts & Text

- ‘font-weight’ property specifies the weight (or boldness) of the font

```
p { font-weight: normal; }
p { font-weight: bold; }
p { font-weight: 200; }
p { font-weight: 600; }
```

  - The number can be between 1 and 1000, inclusive
  - Higher numbers represent weights that are bolder than (or as bold as) lower numbers

- ‘line-height’ property sets the amount of space used for lines, such as in text

```
p { line-height: normal; }
p { line-height: 2.5; }
p { line-height: 3em; }
```

Fonts & Text

- ‘text-align’ property describes how inline content like text is aligned in its parent block element

```
p { text-align: left; }
p { text-align: right; }
p { text-align: center; }
p { text-align: justify; }
```

  - The number can be between 1 and 1000, inclusive
  - Higher numbers represent weights that are bolder than (or as bold as) lower numbers

- ‘line-height’ property sets the amount of space used for lines, such as in text

```
p { line-height: normal; }
p { line-height: 2.5; }
p { line-height: 3em; }
```

Fonts & Text

- ‘text-decoration’ property specifies the appearance of decorative lines used on text
  - It is specified as one or more space-separated values representing the various longhand text-decoration properties
    - text-decoration-line
      - Sets the kind of decoration used, such as ‘underline’ or ‘line-through’
    - text-decoration-color
      - Sets the color of the decoration
    - text-decoration-style
      - Sets the style of the line used for the decoration, such as solid, wavy, or dashed

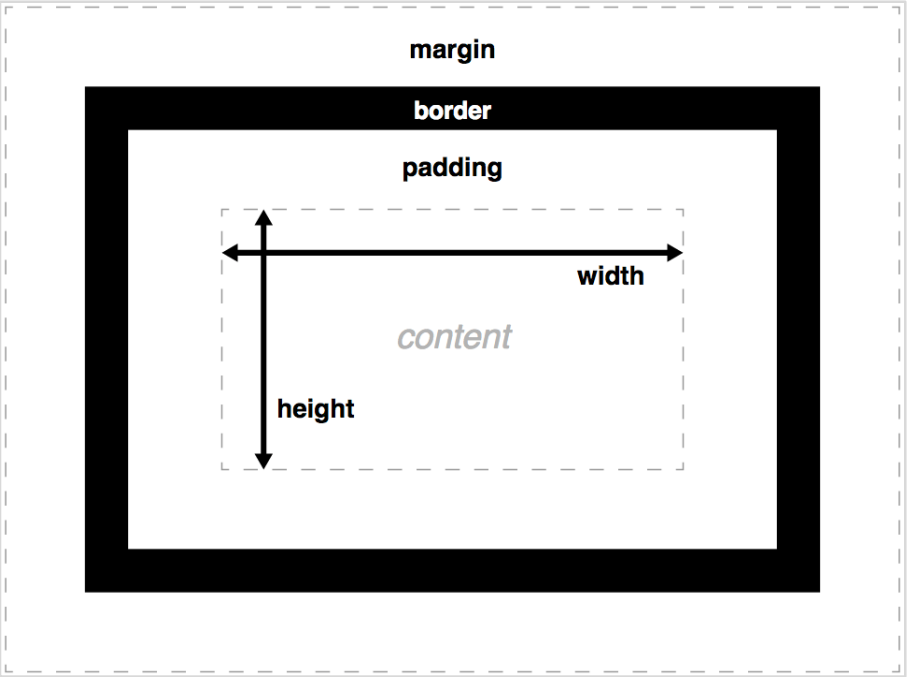
```
p { text-decoration: line-through; }
p { text-decoration: none; }
p { text-decoration: underline red; }
p { text-decoration: wavy overline lime; }
```

Fonts & Text

- Using Google Fonts
  - Navigate to https://fonts.google.com/
  - Use the search bar in the top right corner to find the font of your choice
  - Click the red circle with the plus sign to the right of the font name
  - Now click the grey tab that appears in the lower right corner of the screen
  - Click the "customize" tab and select any of the options you need
  - Click the "embed" tab and copy the link beneath the "standard" option
  - Paste this link tag into the <head> of your web page, before the link to your custom CSS

The Box Model

- Is the foundation of layout on the Web
- Defines the spacing around boxes
- Each element is represented as a rectangular box, with the box's content, padding, border, and margin built up around one another like the layers of an onion
- Margin
  - Is the space outside the border, between the border and the next element
- Padding
  - Is the space inside the border, between the border and the content



The Box Model

- ‘width’ property specifies the width of an element
  - By default, the property defines the width of the content area

```
p { width: 300px; }
p { width: 25em; }
p { width: 75%; }
p { width: auto; }
```

- ‘height’ property specifies the height of an element
- ‘padding’ property sets the padding area on all four sides of an element

```
p { padding: 10px; }
p { padding: 5% 10%; }
p { padding: 1em 2em 3em; }
p { padding: 10px 50px 30px 0; }
```

The Box Model

- ‘margin’ property sets the margin area on all four sides of an element

```
p { margin: 10px; }
p { padding: 5% 10%; }
p { padding: 1em 2em 3em; }
p { padding: 10px 50px 30px 0; }
```

Q & A

- Thank you!