CHAPTER 3
Cascading Style Sheets

Pralhad Kumar Shrestha

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1. Introduction and Levels of Style Sheets

- HTML was NEVER intended to contain tags for formatting a web page!

- HTML was created to describe the content of a web page, like:

  - <h1>This is a heading</h1>

  - <p>This is a paragraph.</p>

- When tags like <font>, and color attributes were added to the HTML 3.2 specification, it started a nightmare for web developers. Development of large websites, where fonts and color information were added to every single page, became a long and expensive process.

- To solve this problem, the World Wide Web Consortium (W3C) created CSS.

- CSS removed the style formatting from the HTML page!
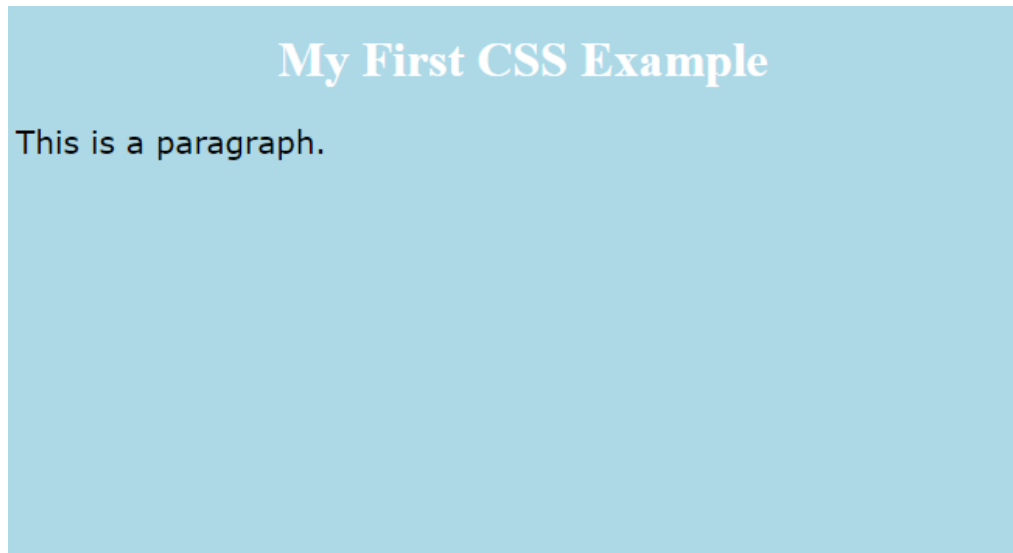
1. Introduction and Levels of Style Sheets

- Cascading Style Sheet (CSS) is a language that describes the style of an HTML document.

- CSS describes how HTML elements should be displayed (element's presentation).

- Example:

```
body {
  background-color: lightblue;
}
```
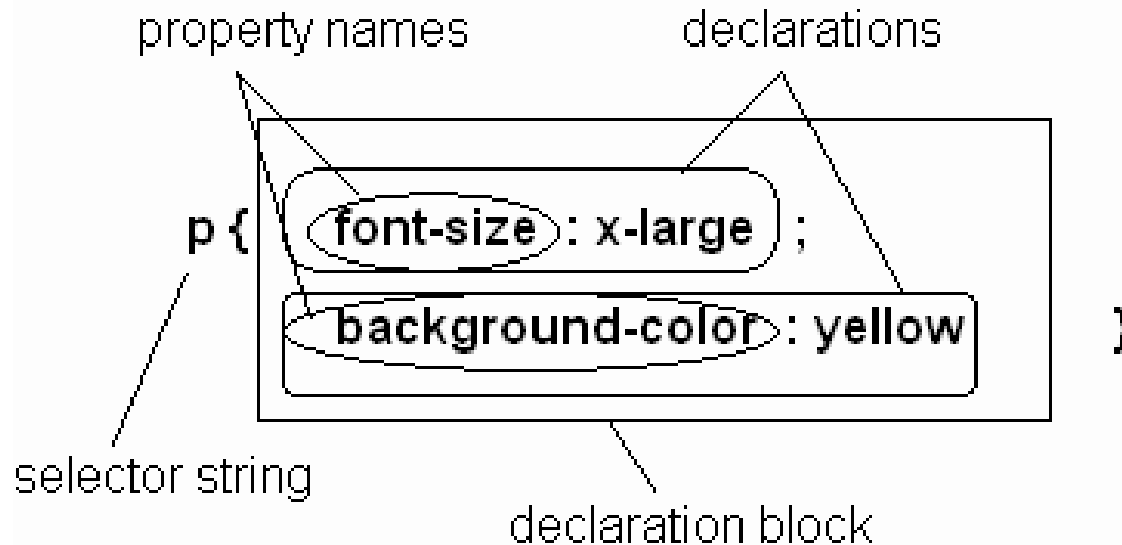
- This changes the background color to **lightblue**.

1. Introduction and Levels of Style Sheets

```html
<!DOCTYPE html>
<html>
<head>
<style>
body {
  background-color: lightblue;
}
h1 {
  color: white;
  text-align: center;
}
p {
  font-family: verdana;
  font-size: 20px;
}
</style>
</head>
<body>
<h1>My First CSS Example</h1>
<p>This is a paragraph.</p>
</body>
</html>
```

My First CSS Example

This is a paragraph.

1. Introduction and Levels of Style Sheets

Cascading Style Sheets

1. Introduction and Levels of Style Sheets

- There are 3 different levels to style our HTML document using style sheets:

1. Inline Style Sheet

2. Internal Style Sheet (Document level)

3. External Style Sheet

Inline Style Sheet

- An inline style may be used to apply a unique style for a single element.
- Specified for a specific occurrence of a tag and apply only to that tag.
  - `<h1 style="color:blue;text-align:center;">This is a heading</h1>`
- This is fine-grain style, which defeats the purpose of style sheets - **uniform style**
- You can insert inline styles anywhere in the middle of your HTML code.

```
<!DOCTYPE html>
<html>
<body>
<h1 style="color:blue;text-align:center;">This is a
heading</h1>
<p style="color:red;">This is a paragraph.</p>
</body>
</html>
```

This is a heading

This is a paragraph.

Internal Style Sheet

- style sheets that apply to the whole document in which they appear.
- You define internal styles in the head section of an HTML page, by using the <style> tag.

```
<style>
body {
  background-color: linen;
}

h1 {
  color: maroon;
  margin-left: 40px;
}
</style>
```

Internal Style Sheet

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
  background-color: linen;
}

h1 {
  color: maroon;
  margin-left: 40px;
}
</style>
</head>
<body>
<h1>This is a heading</h1>
<p>This is a paragraph.</p>
</body>
</html>
```
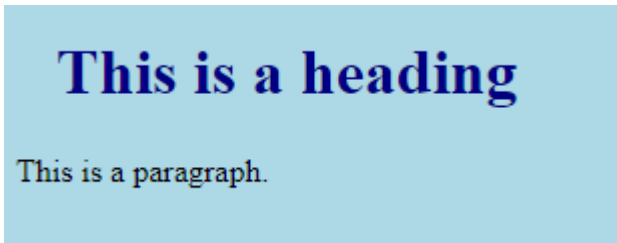
External Style Sheet

- This can be applied to any number of documents.
- With an external style sheet, you can change the look of an entire website by changing just one file.
- When more than one style sheet applies to a specific tag in a document, the lowest level style sheet has precedence.
- You define internal styles in the head section of an HTML page, by using the <style> tag.
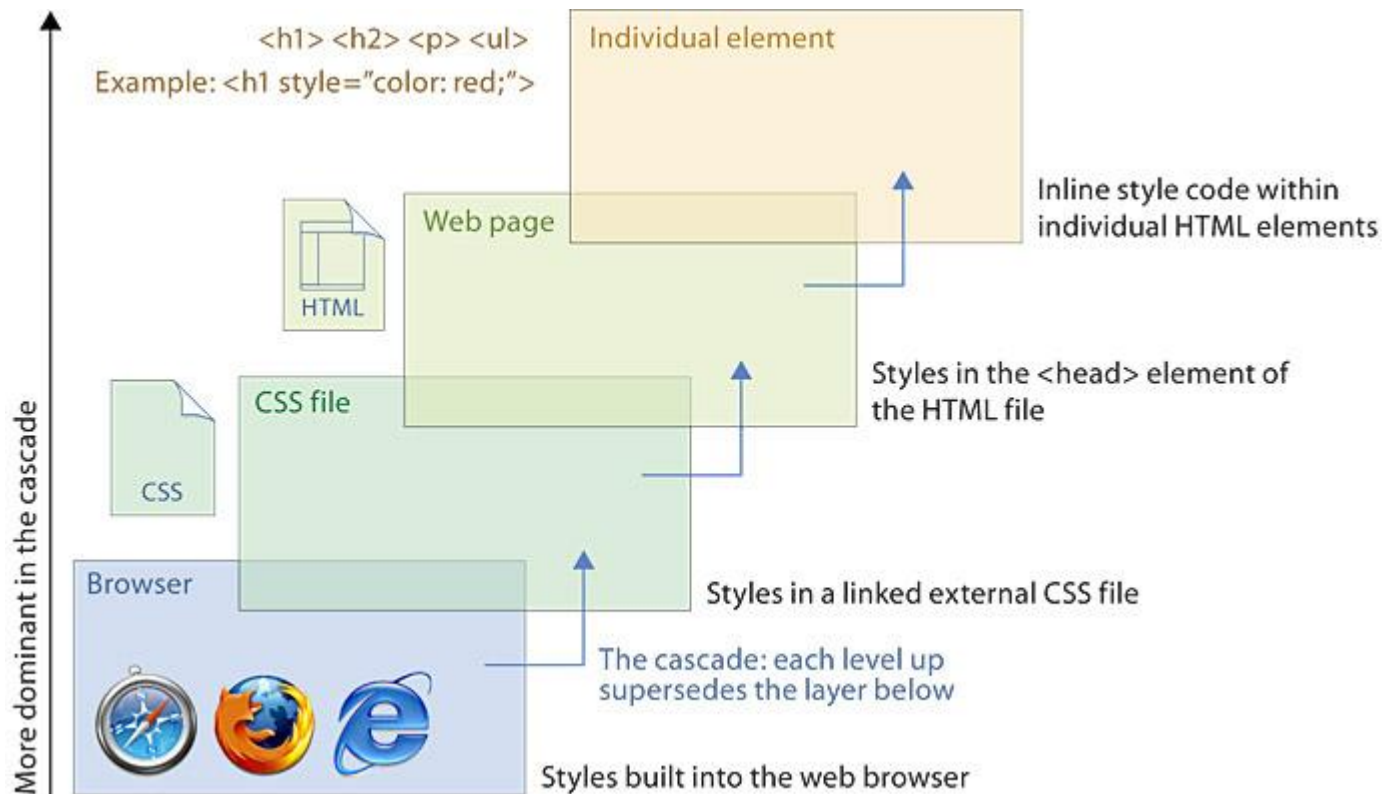
External Style Sheet

```
<!DOCTYPE html>
<html>
<head>
<link rel="stylesheet" type="text/css"
href="mystyle.css">
</head>
<body>
<h1>This is a heading</h1>
<p>This is a paragraph.</p>
</body>
</html>
```

mystyle.css

```
body {
  background-color: lightblue;
}

h1 {
  color: navy;
  margin-left: 20px;
}
```

Hierarchy of Style Sheet

More dominant in the cascade

<h1> <h2> <p>
Example: <h1 style="color: red;">

Individual element

Inline style code within individual HTML elements

Web page

HTML

Styles in the <head> element of the HTML file

CSS file

CSS

Styles in a linked external CSS file

Browser

The cascade: each level up supersedes the layer below

Styles built into the web browser

2. Style Specification Formats

- General Form of Inline Styling is:

  style = " property_1:value_1; property_2:value_2; …….;
          property_n:value_n; ";

- General Form of Internal Styling is:

```
<style type= "text/css">
  selector {
    property_1:value_1;
    property_2:value_2;
    ……;
    property_n:value_n;
  }
</ style>
```

2. Style Specification Formats

- Complex CSS should be documented by using comments.

- Commenting is done in css by using **/* */** code.

- Comment starts with /* and ends with */.

```
<style type= "text/css">
  /* Style for navbar. */
  ………………………………….
  ………………………………….

  /* Style for footer */
  ………………………………….
  ………………………………….
</ style>
```

CSS Selectors

- CSS selectors are used to "find" (or select) the HTML elements you want to style.
- Different CSS selectors to style the HTML.

1. Simple selectors: (select elements based on name, id, class)
   i. **Element Selector**
   – The element selector selects elements based on the element name.
   – It selects all elements of the given type within a document.

   p {
    text-align: center;
    color: red;
   }

   Every paragraph will be affected by the style.

   Learn More at: https://www.w3schools.com/css/css_selectors.asp

CSS Selectors

```
p {
  font-size: 20pt;
}
```

Every paragraph will be affected by the style.

    ii.   **Id selector**:

- ✓   Uses the id attribute of an HTML element to select a specific element.
- ✓   The id of an element is unique within a page, so the id selector is used to select one unique element!
- ✓   To select an element with a specific id, write a hash (#) character, followed by the id of the element.

```
#para1 {
  text-align: center;
  color: red;
}

<p id="para1">Hello World!</p>
```

Hello World!

CSS Selectors

iii. **Class selector**:

- ✓ The class selector selects HTML elements with a specific class attribute.
- ✓ To select elements with a specific class, write a period (.) character, followed by the class name.

```
.center {
  text-align: center;
  color: red;
}
```

```
<h1 class="center">Red and center-aligned heading</h1>
<p class="center">Red and center-aligned paragraph.</p>
```

Red and center-aligned heading

Red and center-aligned paragraph.

CSS Selectors

```
p.center {
  text-align: center;
  color: red;
}

<h1 class="center">This heading will not be affected</h1>
<p class="center">This paragraph will be red and center-aligned.</p>
```

This heading will not be affected

This paragraph will be red and center-aligned.

CSS Selectors

```
p.center {
  text-align: center;
  color: red;
}

p.large {
  font-size: 300%;
}

<h1 class="center">This heading will not be affected</h1>
<p class="center">This paragraph will be red and center-aligned.</p>
<p class="center large">This paragraph will be red, center-aligned, and in a large font-size.</p>
```

CSS Selectors

This heading will not be affected

This paragraph will be red and center-aligned.

This paragraph will be red, center-aligned, and in a large font-size.

CSS Selectors

iv.   Universal selector:

- ✓   The universal selector (*) selects all HTML elements on the page.
- ✓   The universal selector is not often used.

```
<style>
* {
 text-align: center;
 color: blue;
 font-size: 30px;
}
</style>
```

CSS Selectors

```
<!DOCTYPE html>
<html>
<head>
<style>
* {
  text-align: center;
  color: blue;
}
</style>
</head>
<body>
<h1>Hello world!</h1>
<p>Every element on the page will be affected by the style.</p>
<p id="para1">Me too!</p>
<p>And me!</p>
</body>
</html>
```


Hello world!

Every element on the page will be affected by the style.

Me too!

And me!

CSS Selectors

v.   **Generic selector**:
- ✓   The class of style specification that applies to the content of more than one kind of tag.
- ✓   Done by using generic class, which is defined without class name in it's name.
- ✓   Instead of tag name, we use the name of the generic class, which must begin with ".".

```
<body>

<h1>Welcome to My Homepage</h1>
<div class="yellow">
  <p>My name is Donald.</p>
  <p>I live in Duckburg.</p>
</div>
<p>My best friend is Mickey.</p>
<p class="yellow">My best friend is Mickey.</p>

</body>
```

```css
.yellow {
  background-color: yellow;
}
```

CSS Selectors

```
<!DOCTYPE html>
<html>
<head>
<style>
.intro {
  background-color: yellow;
}
</style>
</head>
<body>
<h1>Welcome to My Homepage</h1>
<div class="intro">
  <p>My name is Donald.</p>
  <p>I live in Duckburg.</p>
</div>
<p>My best friend is Mickey.</p>
<p class="intro">My best friend is Mickey.</p>
</body>
</html>
```

Welcome to My Homepage

My name is Donald.

I live in Duckburg.

My best friend is Mickey.

My best friend is Mickey.

CSS Selectors

vi.   Pseudo classes:

- A pseudo-class is used to define a special state of an element.

- For example, it can be used to:
  - Style an element when a user mouse over it
  - Style visited and unvisited links differently
  - Style an element when it gets focus

- Syntax of pseudo class:

```
selector:pseudo-class {
   property: value;
}
```

✓ See example here:
https://www.w3schools.com/css/css_pseudo_classes.asp

CSS Selectors

```css
/* unvisited link */
a:link {
  color: #FF0000;
}

/* visited link */
a:visited {
  color: #00FF00;
}

/* mouse over link */
a:hover {
  color: #FF00FF;
}

/* selected link */
a:active {
  color: #0000FF;
}
```

CSS Selectors

```
<!DOCTYPE html>
<html>
<head>
<style type="text/css">
.btn-input:hover {
background-color: red;
}
input:focus {
background-color: orange;
}
.btn-input {
background-color: #4CAF50;
color: white;
display: inline-block;
padding: 2px 25px;
text-align: center;
width:93%;
}
</style></head>
```

```
<body>
<input class="btn-input" type="button" value="Mouse Over" />
<input type="text"/>
</body>
</html>
```

CSS Selectors

vi. Pseudo classes:

- A pseudo-class is used to define a special state of an element.
- For example, it can be used to:
  - Style an element when a user mouse over it
  - Style visited and unvisited links differently
  - Style an element when it gets focus

- Syntax of pseudo class:

```css
selector:pseudo-class {
    property: value;
}
```

✓ See example here:
https://www.w3schools.com/css/css_pseudo_classes.asp

4. Property and property values

i.   Properties:

➤   There are different properties in 13 categories:

- Background
- Border and outline
- Dimension
- List
- Margin
- Table
- Color

- Padding
- Text
- Generated content
- Font
- Positioning
- Print

See More at W3C site:
https://www.w3.org/wiki/CSS/Properties
For all the CSS properties:
https://www.w3schools.com/cssref/default.asp
http://www.w3.org/community/webed/wiki/CSS/Properties

Property and properties values

ii.   Property Value Forms:

   — Property values can appear in a variety of forms.

➢ **Keywords**

- Keywords are used when there are only a few possible values and are predefined.
  - Eg: left, small, large, medium
- Keyword values are not case sensitive.
  - Small, SmAlL and SMALL => small

➢ **Number**

- Used when no meaningful units can be attached to a numeric property value.
- Integer, decimal values with (+ or –) preceded sign.

Property and properties values

➢ **Length**

- Specified as number values followed by a unit name.
- **Units**:
  - px – pixels
  - in – inches
  - cm – centimeters → Approximate measures
  - pt – points (1/72 inch)
  - pc – picas (12 points)
  - em – height of the letter 'm'
  - ex-height – height of the letter 'x' → Relative length values
- No space is allowed between the number and the unit.
  - E.g. 1.5 px is illegal!

Property and properties values

➢ **Percentage**

- Percentage values are numbers immediately followed by % sign.
- Provides a measure that is relative to length property value.
  - E.g. 75%

➢ **URL values**

- Actual URL can be absolute or relative.
- Preceded by **url**.
  - url(logo.png);
  - url(/media/diamonds.png);
  - url("https://www.example.com/style.css");
- url(protocol://server/pathname)

Property and properties values

➢ **Colors**

For more info:
https://www.w3schools.com/Css/css_colors.asp

- Color name, e.g. white

```
<h1 style="background-color:DodgerBlue;">Hello World</h1>
<p style="background-color:Tomato;">Lorem ipsum...</p>
```

- Hex form: #rrggbb, e.g. #FFFFFF

- Values should be between 00 and FF

```
body { background-color: #fc9; /* same as #ffcc99 */ }
h1 { color: #f0f; /* same as #ff00ff */ }
```

- rgb(n1, n2, n3), e.g. rgb(255, 255, 255)

```
<h2 style="background-color:rgb(255,0,0);">rgb(255, 0, 0)</h2>
<h2 style="background-color:rgb(0,0,255);">rgb(0, 0, 255)</h2>
```

- Property values are inherited by all nested tags, unless overridden

Font Properties

Property	Description
font	Sets all the font properties in one declaration (style, weight, size, font name(s)) e.g. (font: bolder 14pt Arial Helvetica)
font-family	Specifies the font family for text ("Times New Roman", Times, Arial, Helvetica, sans-serif)
font-size	Specifies the font size of text (40px, 30px, 14px)
font-style	Specifies the font style for text (italic, oblique (similar to italic but useless), normal)
font-variant	Specifies whether or not a text should be displayed in a small-caps font
font-weight	Specifies the weight of a font (normal, bold)

For More info:
https://www.w3schools.com/Css/css_font.asp
https://www.w3schools.com/CSSref/pr_font_font.asp

List Properties

- On unordered lists **list-style-type** can be used to specify the shape of the bullets
  - disc (default), square, or circle
  - Set it on either the <ul> or <li> tag

```
ul.a {list-style-type: circle;}
ul.b {list-style-type: square;}
ol.c {list-style-type: upper-roman;}
ol.d {list-style-type: lower-alpha;}
```

- On ordered lists **list-style-type** can be used to change the sequence values

  Learn More at:
  https://www.w3schools.com/cssref/pr_list-style-type.asp
  https://www.w3schools.com/cssref/playdemo.asp?filename=playcss_list-style-type

Background Properties

- The background property is used to perform different operation with background of the provided tag.
- The **background-color** property specifies the background color of elements.

```css
body {background-color: coral;}
```

- The **background-image** property sets one or more background images for an element.

```css
body {
 background-image: url("paper.gif");
 background-color: #cccccc;
}
```

Learn More at:

https://www.w3schools.com/cssref/css3_pr_background.asp
https://www.w3schools.com/cssref/pr_background-image.asp

Background Properties

- The **background-repeat** property sets if/how a background image will be repeated.
  - **Possible values:** repeat (default), repeat-x, repeat-y or no-repeat
  - Repeated both vertically and horizontally.

```css
body {
    background-image: url("paper.gif");
    background-repeat: repeat-y;
}
```

Learn More at:
https://www.w3schools.com/cssref/css3_pr_background.asp
https://www.w3schools.com/cssref/pr_background-repeat.asp

Text Properties

- The **text-indent** property allows indentation of the first line in a text-block.
- Takes either a length or a % value.

```
div.a {
  text-indent: 50px;
}
div.b {
  text-indent: -2em;
}
div.c {
  text-indent: 30%;
}
```

Learn More at:
https://www.w3schools.com/cssref/pr_text_text-indent.asp

Text Properties

- The **text-align** property specifies the horizontal alignment of text in an element.
- **Property values**: left (default), center, right, or justify

```css
h1 {
    text-align: center;
}

p.date {
    text-align: right;
}
```

Learn More at:
https://www.w3schools.com/cssref/pr_text_text-align.asp

Float property

- The **float** property specifies whether an element should float to the left, right, or not at all.

```
img  {
  float: left;
}
```

Value	Description
none	The element does not float, (will be displayed just where it occurs in the text). (**default value**)
left	The element floats to the left of its container.
right	The element floats the right of its container.
initial	Sets the property to its default value.
inherit	Inherits this property from its parent element.

Float property

The float Property

In this example, the image will float to the right in the text, and the text in the paragraph will wrap around the image.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus imperdiet, nulla et dictum interdum, nisi lorem egestas odio, vitae scelerisque enim ligula venenatis dolor. Maecenas nisl est, ultrices nec congue eget, auctor vitae massa. Fusce luctus vestibulum augue ut aliquet. Mauris ante ligula, facilisis sed ornare eu, lobortis in odio. Praesent convallis urna a lacus interdum ut hendrerit risus congue. Nunc sagittis dictum nisi, sed ullamcorper ipsum dignissim ac. In at libero sed nunc venenatis imperdiet sed ornare turpis. Donec vitae dui eget tellus gravida venenatis. Integer fringilla congue eros non fermentum. Sed dapibus pulvinar nibh tempor porta. Cras ac leo purus. Mauris quis diam velit.
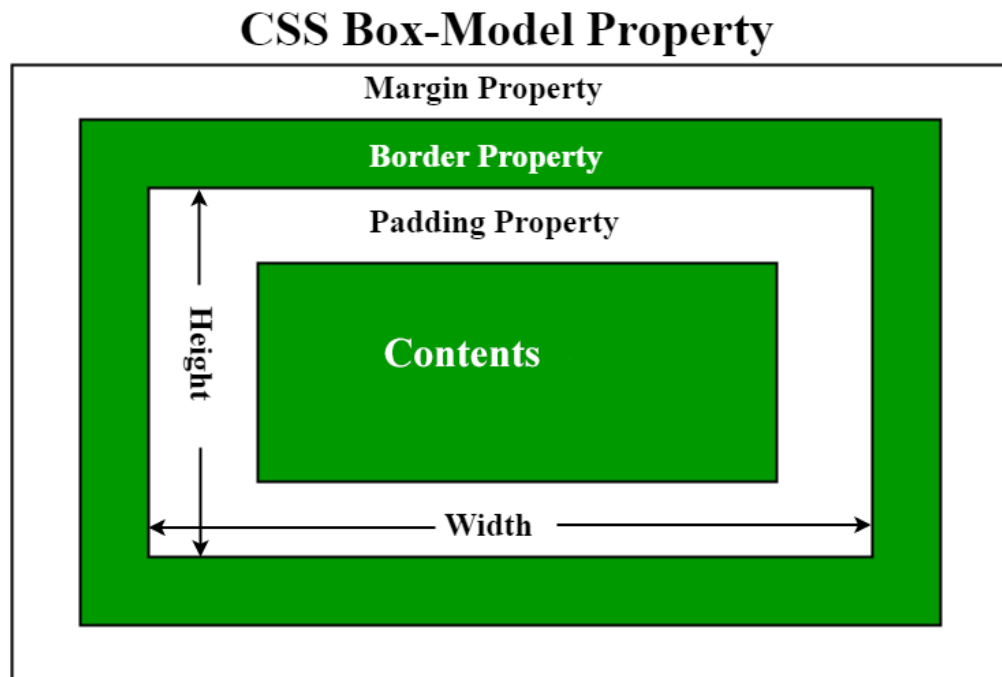
Learn More:
https://www.w3schools.com/cssref/pr_class_float.asp

The Box Model

- The CSS **box model** is essentially a box that wraps around every HTML element.

CSS Box-Model Property

The Box Model

- The CSS **box model** is a container that contains multiple properties including borders, margin, padding, and the content itself.
- The box model allows us to add a border around elements, and to define space between elements.
- **Box Model:**
    - **Content** - The content of the box, where text and images appear
    - **Padding** - Clears an area around the content. The padding is transparent
    - **Border** - A border that goes around the padding and content
    - **Margin** - Clears an area outside the border. The margin is transparent

Learn More at:
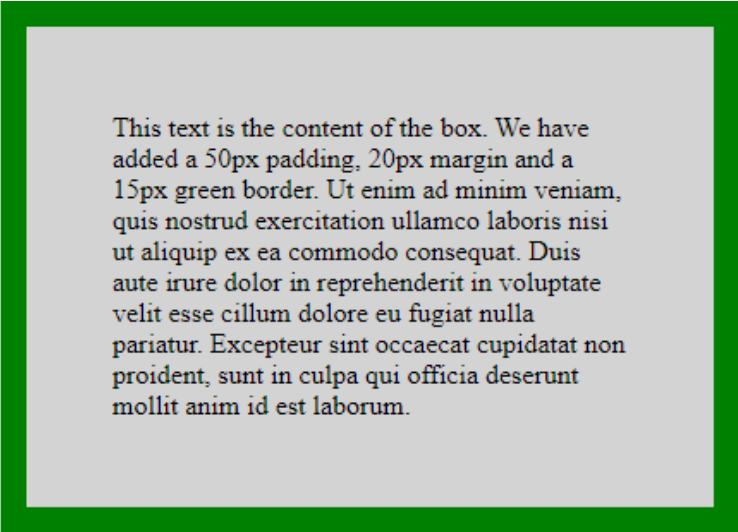https://www.w3schools.com/css/css_boxmodel.asp

The Box Model

```
div {
  width: 300px;
  border: 15px solid green;
  padding: 50px;
  margin: 20px;
}
```

<div>
This text is the content of the box. We have added a 50px padding, 20px margin and a 15px green border. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
</div>

This text is the content of the box. We have added a 50px padding, 20px margin and a 15px green border. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Borders

- The CSS border properties allow you to specify the style, width, and color of an element's border.

```css
p.dotted {border-style: dotted;}
p.dashed {border-style: dashed;}
p.solid {border-styl: solid;}
p.double {border-style: double;}
p.groove {border-style: groove;}
p.ridge {border-style: ridge;}
p.inset {border-style: inset;}
p.outset {border-style: outset;}
p.none {border-style: none;}
p.hidden {border-style: hidden;}
p.mix {border-style: dotted dashed solid double;}
```

Learn More at:
https://www.w3schools.com/css/css_border.asp

Borders

Border-style value	Description
Dotted	Defines a dotted border
dashed	Defines a dashed border
solid	Defines a solid border
double	Defines a double border
groove	Defines a 3D grooved border. The effect depends on the border-color value
ridge	Defines a 3D ridged border. The effect depends on the border-color value
inset	Defines a 3D inset border. The effect depends on the border-color value
outset	Defines a 3D outset border. The effect depends on the border-color value
none	Defines no border
hidden	Defines a hidden border

Border Width

- The border-width property specifies the width of the four borders.
- The width can be set as a specific size (in px, pt, cm, em, etc) or by using one of the three pre-defined values:
  - thin
  - medium
  - thick

Learn More at:
https://www.w3schools.com/css/css_border_width.asp

```css
p.one {
  border-style: solid;
  border-width: 5px;
}
p.two {
  border-style: solid;
  border-width: medium;
}
p.three {
  border-style: dotted;
  border-width: 2px;
}
p.four {
  border-style: dotted;
  border-width: thick;
}
```

Border Width

- The border-width property can have from one to four values (for the top border, right border, bottom border, and the left border)

```css
p.two {
  border-style: solid;
  border-width: 20px 5px; /* 20px top and bottom, 5px on the sides */
}

p.three {
  border-style: solid;
  border-width: 25px 10px 4px 35px; /* 25px top, 10px right, 4px bottom and
35px left */
}
```

Border Shorthand Property

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

```
p {
  border: 5px solid red;
}

p {
  border-left: 6px solid red;
}
```

Margins

- The CSS margin properties are used to create space around elements, outside of any defined borders.
- With CSS, you have full control over the margins.
- There are properties for setting the margin for each side of an element (top, right, bottom, and left).
- CSS has properties for specifying the margin for each side of an element.
  - margin-top
  - margin-right
  - margin-bottom
  - margin-left
- All the margin properties can have the following values:
  - auto - the browser calculates the margin
  - length - specifies a margin in px, pt, cm, etc.
  - % - specifies a margin in % of the width of the containing element
  - inherit - specifies that the margin should be inherited from the parent element

```css
p {
    margin-top: 100px;
    margin-bottom: 100px;
    margin-right: 150px;
    margin-left: 80px;
}
```

Padding

- Padding is used to create space around an element's content, inside of any defined borders.
- The CSS padding properties are used to generate space around an element's content, inside of any defined borders.
- With CSS, you have full control over the padding. There are properties for setting the padding for each side of an element (top, right, bottom, and left).
- CSS has properties for specifying the padding for each side of an element:
  - padding-top
  - padding-right
  - padding-bottom
  - padding-left

```css
div {
    padding-top: 50px;
    padding-right: 30px;
    padding-bottom: 50px;
    padding-left: 80px;
}
```

Learn More at:
https://www.w3schools.com/css/css_padding.asp

Background Image

- The background-image property specifies an image to use as the background of an element.
- By default, the image is repeated so it covers the entire element.

```css
body {
  background-image: url("paper.gif");
}
```

Learn More at:
https://www.w3schools.com/css/css_background_image.asp

The <span> and <div> tags

- The **<span>** tag is an inline container (element) used to mark up a part of a text, or a part of a document.
- The **<span>** tag is easily styled by CSS or manipulated with JavaScript using the class or id attribute.
- Special font properties can be applied to whole paragraph of text using **<span>** tag.

```
<p>My mother has <span style="color:blue">blue</span> eyes.</p>

<p>My mother has <span class="color-blue">blue</span> eyes.</p>

.color-blue {
  color: blue;
}
```

The and <div> tags

<!DOCTYPE html>
<html>
<body>
<h1>The span element</h1>
<p>My mother has blue eyes and my father has dark green eyes.</p>
</body>
</html>

The span element

My mother has **blue** eyes and my father has **dark green** eyes.

The <span> and <div> tags

- The **<div>** tag defines a division or a section in an HTML document.
- The **<div>** tag is used as a container for HTML elements - which is then styled with CSS or manipulated with JavaScript.
- The **<div>** tag is easily styled by using the class or id attribute.
- The **<div>** tag is a block-level element.
- By default, browsers always place a line break before and after the <div> element.
- Most browsers will display <div> element with the below property.

```css
div {
  display: block;
}
```

The <span> and <div> tags

```
<!DOCTYPE html>
<html>
<body>
<h1>The div element</h1>
<p>This is some text outside the div element.</p>
<div>
  <p>This is some text in a div element. This is some
text in a div element. This is some text in a div element.
This is some text in a div element. This is some text in a
div element. This is some text in a div element.</p>
</div>
<p>This is some text outside the div element.</p>
</body>
</html>
```

The <span> and <div> tags

The div element

This is some text outside the div element.

This is some text in a div element. This is some text in a div element. This is some text in a div element. This is some text in a div element. This is some text in a div element. This is some text in a div element.

This is some text outside the div element.

End of chapter 3