



Certificate in Software Engineering (CSE)

Team Project

Lecture # 2

CSS for Formatting

CSS Box Model

CSS Layout

Mary Giblin



Objectives

Applied

1. Given an HTML document, create a CSS style sheet for formatting the web page.

Knowledge

1. Describe three ways to include CSS in a web page.
2. Explain why it's usually best to use an external style sheet for formatting a page.



Objectives (cont.)

4. Distinguish between absolute and relative units of measurement.
5. Describe three ways to specify color in CSS, and describe how CSS3 expands upon that.
6. Describe these types of selectors: universal, type, id, class, descendant, child, sibling, pseudo-class, and pseudo-element.
7. Describe one accessibility guideline for using pseudo-class selectors.
8. Explain how user style sheets, !important rules, and specificity are used in the cascade order for applying rule sets.
9. Describe these properties for styling fonts: font-family, font-style, font-weight, font-size, and line-height.
10. Describe these properties for formatting text: text-indent, text-align, text-decoration, and text-shadow.



Three ways to provide styles

Use an external style sheet

```
<link rel="stylesheet" href="styles/main.css">
```

Embed the styles in the head section

```
<style>
  body {
    font-family: Arial, Helvetica, sans-serif;
    font-size: 87.5%; }
  h1 { font-size: 250%; }
</style>
```

Use the style attribute to apply styles to a single element

```
<h1 style="font-size: 500%; color: red;">
  Valley Town Hall</h1>
```



The sequence in which styles are applied

- Styles from an external style sheet
- Embedded styles
- Inline styles



A head element that includes two style sheets

```
<head>  
  <title>San Joaquin Valley Town Hall</title>  
  <link rel="stylesheet" href="../styles/main.css">  
  <link rel="stylesheet" href="../styles/speaker.css">  
</head>
```

The sequence in which styles are applied

- From the first external style sheet to the last



How to specify the medium for a style sheet

```
<link rel="stylesheet" href="../styles/print.css"  
      media="print">
```



Common units of measure

Symbol	Name	Type	Description
px	pixel	absolute	A single dot on a monitor. The number of dots per inch depends on the resolution of the monitor.
pt	point	absolute	A point is 1/72 of an inch.
em	ems	relative	One em is equal to the font size for the current font.
%	percent	relative	A percent specifies a value relative to the current value.



The HTML for a web page

```
<body>
  <div id="header">
    
    <h1>San Joaquin Valley Town Hall</h1>
  </div>
  <div id="main">
    <p>Welcome to San Joaquin Valley Town Hall. We have some
    fascinating speakers for you this season!</p>
  </div>
</body>
```



CSS that uses relative units of measure

```
body {  
    font-size: 87.5%;  
    margin-left: 2em; }  
#header {  
    padding-bottom: .75em;  
    border-bottom: 3px solid black;  
    margin-bottom: 1.5em; }  
h1 {  
    font-size: 200%;  
    margin-bottom: 0; }
```



The web page in a web browser



San Joaquin Valley Town Hall

Welcome to San Joaquin Valley Town Hall. We have some fascinating speakers for you this season!



16 descriptive color names

black	silver	white	aqua
red	lime	green	maroon
yellow	olive	purple	teal
gray	blue	fuchsia	navy



Three ways to specify colors

With a color name

```
color: silver;
```

With an RGB (red-green-blue) value

```
color: rgb(100%, 40%, 20%);
```

```
color: rgb(255, 102, 51);
```

With a hexadecimal number for an RGB value

```
color: #ffffff;
```

```
color: #000000;
```

```
color: #ff0000;
```



CSS that uses hexadecimal values for colors

```
body {  
    font-size: 87.5%;  
    margin-left: 2em;  
    background-color: #FFFFCC; }  
h1 {  
    font-size: 200%;  
    color: #00F; }
```



The HTML in a web browser



San Joaquin Valley Town Hall

Welcome to San Joaquin Valley Town Hall. We have some fascinating speakers for you this season!



Three ways to code CSS3 colors

The syntax for RGBA colors

`rgba(red%, green%, blue%, opacity-value)`

The syntax for HSL and HSLA colors

`hsl(hue-degrees, saturation%, lightness%)`

`hsla(hue-degrees, saturation%, lightness%, opacity-value)`

Examples of CSS3 colors

```
h1 { color: rgba(0, 0, 255, .2) }      /* transparent blue */
h1 { color: hsl(120, 100%, 25%) }      /* dark green */
h1 { color: hsl(120, 75%, 75%) }       /* pastel green */
h1 { color: hsla(240, 100%, 50%, 0.5) } /* semi-transparent
                                         solid blue */
```




Examples of CSS3 colors

```
h1 { color: rgba(0, 0, 255, .2) }  
h1 { color: hsl(120, 100%, 25%) }  
h1 { color: hsl(120, 75%, 75%) }  
h1 { color: hsla(240, 100%, 50%, 0.5) }
```

The colors in a browser

San Joaquin Valley Town Hall

San Joaquin Valley Town Hall

San Joaquin Valley Town Hall

San Joaquin Valley Town Hall



HTML that can be selected by type, id, or class

```
<section id="main">
  <h1>The 2025-2026 Speaker Lineup</h1>
  <p class="blue">October 19, 2025: Jeffrey Toobin</p>
  <p class="blue">
    November 16, 2025: Andrew Ross Sorkin</p>
</section>
<footer>
  <p class="blue right">Copyright 2025</p>
</footer>
```



CSS rule sets that select by type, id, and class

```
*{margin: .5em 1em;}

h1 { font-family:Arial, sans-serif;}

p{margin-left:3em;}

#main{
    border:2px solid black;
    padding: 1em;}

.blue{ color: blue;}

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



CSS rule sets with relational selectors

Descendant

```
#main li { font-size: 14pt; }  
ul a { color: green; }
```

Adjacent sibling

```
h2+p { margin-top: .5em; }
```

Child (not supported by some older browsers like IE6)

```
#main>p { font-size: 11pt; }  
li>a { color: green; }
```

General sibling (a new feature of CSS3)

```
h2~p { margin-left: 2em; }
```



Combinations of selectors

A selector for a class within an element

```
ul.speakers { list-style-type: square; }
```

Multiple selectors

```
h1, h2, h3 { color: blue; }  
p, ul.speakers li {  
    font-family: "Times New Roman", serif; }
```



Common CSS pseudo-classes

- :link
- :visited
- :active
- :hover
- :focus

Accessibility guideline

- Apply the same formatting to the :hover and :focus pseudo-classes for an element.
- That way, those who can't use the mouse will have the same experience as those who can.



Common CSS3 pseudo-classes

- :first-child
- :last-child
- :only-child

Common pseudo-elements

- :first-letter
- :first-line



HTML that can be used by pseudo selectors

```
<div id="main">
  <p>Welcome to San Joaquin Valley Town Hall.</p>
  <p>We have some fascinating speakers for you this season!</p>
  <ul>
    <li><a href="toobin.html">Jeffrey Toobin</a></li>
    <li><a href="sorkin.html">Andrew Ross Sorkin</a></li>
    <li><a href="chua.html">Amy Chua</a></li>
  </ul>
</div>
```




CSS for pseudo-class selectors

```
a:link { color: green; }  
a:hover, a:focus { color: fuchsia }
```

The rules in a browser

Welcome to San Joaquin Valley Town Hall.

We have some fascinating speakers for you this season!

- Jeffrey Toobin
- Andrew Ross Sorkin
- Amy Chua





The five generic font families

- serif
- sans-serif
- monospace
- cursive
- fantasy



Examples of the five generic font families

Times New Roman is a serif font. It is the default for most web browsers.

Arial is a sans-serif font that is widely used, and sans-serif fonts are best for web pages.

Courier New is a monospace font that is used for code examples.

Lucida Handwriting is a cursive font that is not frequently used.

Impact is a fantasy font that is rarely used.



How to specify a font family

```
font-family: Arial, Helvetica, sans-serif;  
font-family: "Times New Roman", Times, serif;  
font-family: "Courier New", Courier, monospace;
```

How to specify the font size

```
font-size: 12pt;      /* points */  
font-size: 150%;      /* percent of the parent element */  
font-size: 1.5em;     /* same as 150% */
```



A font-family rule that's inherited by descendants

```
body {  
    font-family: Arial, Helvetica, sans-serif;  
    font-size: 87.5%; }
```

A rule that overrides the inherited font family

```
p { font-family: "Times New Roman", Times, serif; }
```



Other properties for styling fonts

- font-style
- font-weight
- font-variant
- line-height



How to specify font styles and variants

```
font-style: italic;  
font-style: normal;          /* remove style */  
font-variant: small-caps;
```

How to specify font weights;

```
font-weight: 700;  
font-weight: bold;           /* same as 700 */  
font-weight: normal;         /* same as 400 */  
font-weight: lighter;        /* relative to the parent  
                             element */
```

How to specify line height

```
line-height: 14pt;  
line-height: 140%;  
line-height: 1.4em;          /* same as 140% */  
line-height: 1.4;            /* same as 140% and 1.4em */
```



Properties for indenting and aligning text

- text-indent
- text-align
- vertical-align



The HTML for a web page

```
<div id="header">
  <h1>San Joaquin Valley Town Hall</h1>
</div>
<div id="main">
  <p>Welcome to San Joaquin Valley Town Hall. We have
    some fascinating speakers for you this season!</p>
</div>
<div id="footer">
  <p>&copy; Copyright 2025 San Joaquin Valley Town
    Hall.</p>
</div>
```



CSS for indenting and horizontal alignment

```
body {  
    font-size: 87.5%;  
    margin: 2em; }  
h1 {  
    font-size: 180%; }  
#main p { text-indent: 2em; }  
footer p {  
    font-size: 80%;  
    text-align: right; }
```

San Joaquin Valley Town Hall

Welcome to San Joaquin Valley Town Hall. We have some fascinating speakers for you this season!

© Copyright 2025 San Joaquin Valley Town Hall.



Properties for transforming and decorating text

- text-transform
- text-decoration



The HTML for a web page

```
<div id="header">
  <h1>San Joaquin Valley Town Hall</h1>
</div>
<div id="main">
  <p>Welcome to San Joaquin Valley Town Hall. We have
    some fascinating speakers for you this season!</p>
</div>
```

CSS that specifies transforms and decorations

```
h1 {
  font-size: 150%;
  text-align: center;
  text-transform: uppercase;
  text-decoration: underline overline;
}
```

SAN JOAQUIN VALLEY TOWN HALL

Welcome to San Joaquin Valley Town Hall. We have some fascinating speakers for you this season!



The syntax of the text-shadow property

text-shadow: horizontalOffset, verticalOffset,
blurRadius, shadowColor;

Accessibility guideline

- Remember the visually-impaired. Too much shadow or blur makes text harder to read.

A heading that uses a shadow

The h1 element

```
<h1>San Joaquin Valley Town Hall</h1>
```

The CSS

```
h1 {  
    color: #ef9c00;  
    text-shadow: 4px 4px; }
```

The heading in a browser

San Joaquin Valley Town Hall



Another way to apply a shadow

The h1 element

```
<h1>San Joaquin Valley Town Hall</h1>
```

The CSS

```
h1 {  
    color: blue;  
    text-shadow: -2px -2px 4px red; }
```

The heading in a browser

San Joaquin Valley Town Hall



An image that has been floated to the left



San Joaquin Valley Town Hall

Bringing cutting-edge speakers to the valley

The HTML

```

<h1>San Joaquin Valley Town Hall</h1>
<h2>Bringing cutting-edge speakers to the valley</h2>
```

The CSS

```
img {
    float: left;
    margin-right: 1em;
}
```



The page if the image width is reduced to 60



San Joaquin Valley Town Hall

Bringing cutting-edge speakers to the valley

How to stop the floating before an element

```
#main { clear: left; }
```




Objectives

Applied

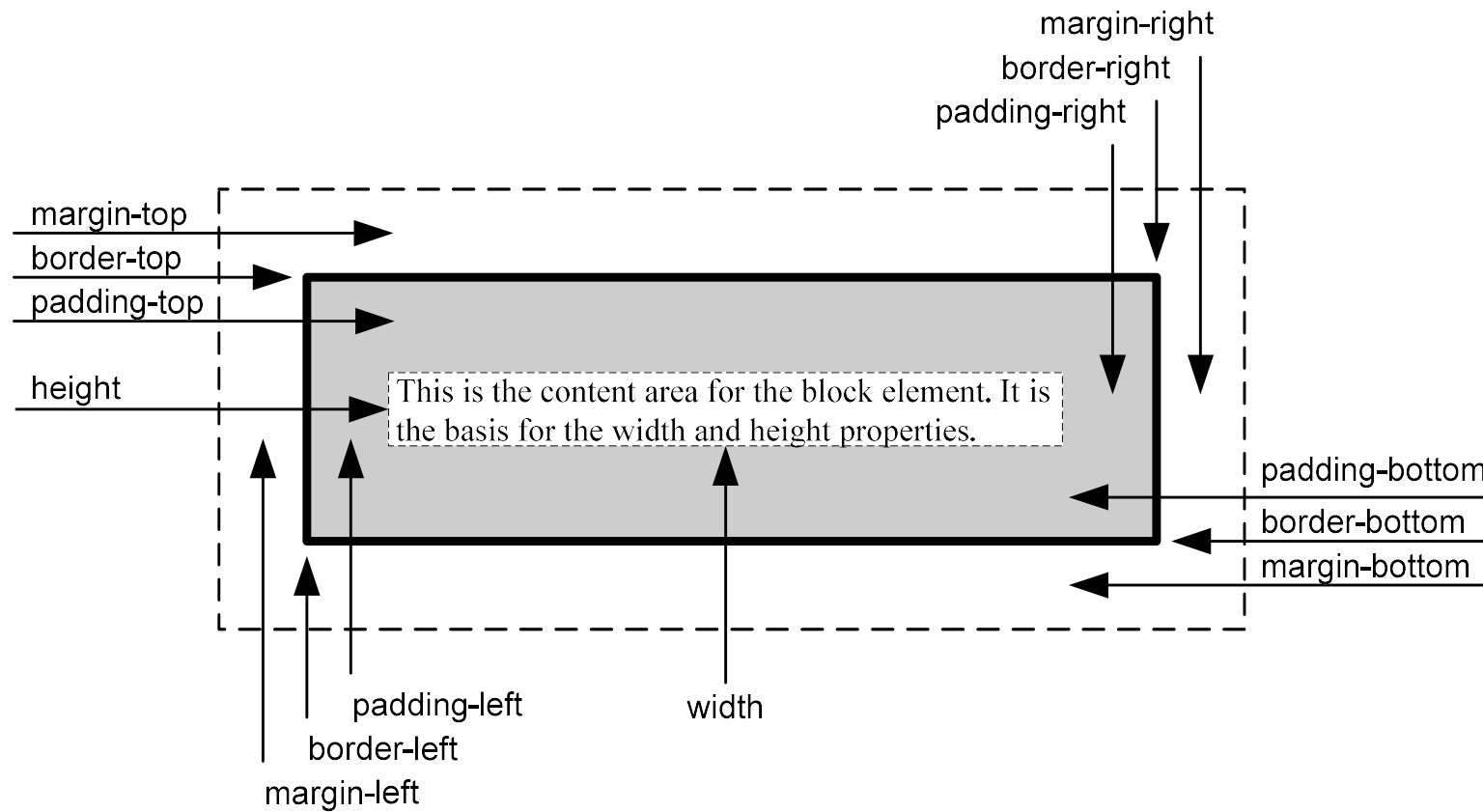
1. Given an HTML document, create CSS rule sets that use the CSS box model to apply spacing, borders, and backgrounds to the web page.

Knowledge

1. Describe the use of the CSS box model.
2. Explain how the CSS box model can be used to control the spacing between the headings and paragraphs on a page.
3. Describe these properties for a block element in a box model: height, width, margin, padding, border, background color, and background image.
4. Describe these CSS3 features for formatting boxes: rounded corners, shadows, background gradients.



The CSS box model





The HTML for a page that uses the box model

```
<body>
  <div id="main">
    <h1>San Joaquin Valley Town Hall</h1>
    <p>Welcome to San Joaquin Valley Town Hall.
      We have some fascinating speakers for you this
      season!</p>
  </div>
</body>
```



The CSS for the page

```
body {
    border: 3px dotted black;
    margin: 10px;
}
#main {
    border: 2px solid black;
    width: 500px;
    margin: 20px;          /* all four sides */
    padding: 10px;        /* all four sides */
}
h1, p {
    border: 1px dashed black;
    padding: 10px;
}
h1 {
    margin: .5em 0 .25em;  /* .5em top, 0 right and left,
                           .25em bottom */
    padding-left: 15px;
}
p {
    margin: 0;             /* all four sides */
    padding-left: 15px;
}
```



The web page in a browser





Properties for setting heights and widths

- width
- height
- min-width
- max-width
- min-height
- max-height



How to set the width of the content area

```
width: 450px;    /* an absolute width */  
width: 75%;      /* a relative width */  
width: auto;     /* width based on its containing block */
```

How to set the height of the content area

```
height: 125px;  
height: 50%;  
height: auto;    /* height based on its content */
```

How to set the minimums and maximums

```
min-width: 450px;  
max-width: 600px;  
min-height: 120px;  
max-height: 160px;
```



Properties for setting margins

- margin
- margin-top
- margin-right
- margin-bottom
- margin-left

Mnemonic device

- *trouble*



How to set the margin on one side of an element

```
margin-top: .5em;  
margin-right: 1em;  
margin-bottom: 2em;  
margin-left: 1em;
```

How to set the margins on multiple sides

```
margin: 1em; /* all four sides */  
margin: 0 1em;  
margin: .5em 1em 2em;  
margin: .5em 1em 2em 1em;
```



Properties for setting padding

- padding-top
- padding-right
- padding-bottom
- padding-left
- padding



How to set the padding on one side of an element

```
padding-top: 0;  
padding-right: 1em;  
padding-bottom: .5em;  
padding-left: 1em;
```

How to set the padding on multiple sides

```
padding: 1em; /* all four sides */  
padding: 0 1em;  
padding: 0 1em .5em;  
padding: 0 1em .5em 1em;
```



Properties for setting borders

- border
- border-*side*
- border-width
- border-style
- border-color
- border-*side*-width
- border-*side*-style
- border-*side*-color

The syntax for the shorthand border properties

border: [width] [style] [color];

border-side: [width] [style] [color];



How to set border properties

```
border: thin solid green;  
border: 2px dashed #808080;  
border: 1px inset;           /* uses the element's  
                             color property */
```

How to set side borders

```
border-top: 2px solid black;  
border-right: 4px double blue;
```



How to set the widths of borders

```
border-width: 1px;                /* all four sides */
border-width: 1px 2px;
border-width: 1px 2px 2px;
border-width: 1px 2px 2px 3px;
```

How to set the style of borders

```
border-style: dashed;              /* dashed line all sides */
border-style: solid none;          /* solid top and bottom, no
                                   border right and left */
```

How to set the color of borders

```
border-color: #808080;
border-color: black gray;          /* black top and bottom,
                                   gray right and left */
```

How to set the width, style, and color

```
border-bottom-width: 4px;
border-right-style: dashed;
border-left-color: gray;
```



The border-radius and box-shadow properties

```
border-radius: radius; /* applies to all four corners */  
border-radius: topLeft topRight lowerRight lowerLeft;  
box-shadow: horizontalOffset verticalOffset blurRadius  
spread color;
```

Guidelines for backward compatibility

- To round corners and add shadows in older versions of Firefox, you can use the `-moz-border-radius` and `-moz-box-shadow` properties.
- To add shadows in older versions of Safari and Chrome, you can use the `-webkit-box-shadow` property.



The HTML for a section

```
<div id="main">  
    <a href="ebooks_index.html">$10 Ebooks!</a>  
</div>
```

The CSS for the section

```
#main {  
    padding: 20px;  
    width: 160px;  
    border: 5px double blue;  
    color: blue;  
    font-size: 200%;  
    text-align: center;  
    font-weight: bold;  
    border-radius: 10px 20px 0 20px;  
    box-shadow: 3px 3px 4px 4px red;  
}
```




The section in a browser

\$10 Ebooks!



The properties for background color and image

- background
- background-color
- background-image
- background-repeat
- background-attachment
- background-position

The shorthand background property

background: [color] [image] [repeat] [attachment]
[position];

Accessibility guideline

- Don't use a background color or image that makes the text that's over it difficult to read.



How to use the background shorthand property

```
background: blue;  
background: blue url("../images/texture.gif");  
background: #808080 url("../images/header.jpg")  
           repeat-y scroll center top;
```

How to set the background color and image

```
background-color: blue;  
background-image: url("../images/texture.gif");
```



Image repetition, position, and scrolling

```
background-repeat: repeat;  
background-repeat: repeat-x;  
background-repeat: repeat-y;  
background-repeat: no-repeat;
```

```
background-position: left top;  
background-position: center top;  
background-position: 90% 90%;
```

```
background-attachment: scroll;  
background-attachment: fixed;
```



The syntax for a linear gradient in the background-image property

```
background-image:  
    linear-gradient(direction, color %, color %, ... );
```