Jan 24 lecture notes
```
<title>Table Demo</title>
<style>
table, th, td {
  border: 1px solid black;
}
</style>

<body>
<p>Hello class this is a paragraph tag &lt;p&gt; ta do &lt;/p&gt;</p>
<table>
  <caption>Color Combinations</caption>
  <tr>
    <th>&nbsp;</th>
    <th>Red</th>
    <th>Yellow</th>
    <th>Blue</th>
  </tr>
  <tr>
    <th>Red</th>
    <td>Red</td>
    <td>Orange</td>
    <td>Purple</td>
  </tr>
  <tr>
    <th>Yellow</th>
    <td>Yellow</td>
    <td>Green</td>
    <td>Blue</td>
  </tr>
</table>
</body>
```
Reserved characters in HTML must be replaced with character entities.

Characters that are not present on your keyboard can also be replaced by entities.

**HTML Entities**

Some characters are reserved in HTML.

If you use the less than (<) or greater than (>) signs in your text, the browser might mix them with tags.

Character entities are used to display reserved characters in HTML.

A character entity looks like this:

https://www.w3schools.com/html/html_entities.asp
Character entities are used to display reserved characters in HTML.

A character entity looks like this:

```html
&entity_name;
```

OR

```html
&#entity_number;
```

To display a less than sign (<) we must write: `&lt;` or `&#60;`

**Advantage of using an entity name:** An entity name is easy to remember.

**Disadvantage of using an entity name:** Browsers may not support all entity names, but the support for numbers is good.

https://www.w3schools.com/html/html_entities.asp
Non-breaking Space

A common character entity used in HTML is the non-breaking space: \&nbsp;.

A non-breaking space is a space that will not break into a new line.

Two words separated by a non-breaking space will stick together (not break into a new line). This is handy when breaking the words might be disruptive.

Examples:

- § 10
- 10 km/h
- 10 PM

Another common use of the non-breaking space is to prevent that browsers truncate spaces in HTML pages.

If you write 10 spaces in your text, the browser will remove 9 of them. To add real spaces to your text, you can use the \&nbsp; character entity.

The non-breaking hyphen (\&#8209;) lets you use a hyphen character (-) that won't break.  

https://www.w3schools.com/html/html_entities.asp
# Some Other Useful HTML Character Entities

<table>
<thead>
<tr>
<th>Result</th>
<th>Description</th>
<th>Entity Name</th>
<th>Entity Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>non-breaking space</td>
<td> </td>
<td>&amp;#160;</td>
</tr>
<tr>
<td>&lt;</td>
<td>less than</td>
<td>&lt;</td>
<td>&amp;#60;</td>
</tr>
<tr>
<td>&gt;</td>
<td>greater than</td>
<td>&gt;</td>
<td>&amp;#62;</td>
</tr>
<tr>
<td>&amp;</td>
<td>ampersand</td>
<td>&amp;</td>
<td>&amp;#38;</td>
</tr>
<tr>
<td>&quot;</td>
<td>double quotation mark</td>
<td>&quot;</td>
<td>&amp;#34;</td>
</tr>
<tr>
<td>'</td>
<td>single quotation mark (apostrophe)</td>
<td>'</td>
<td>&amp;#39;</td>
</tr>
<tr>
<td>¢</td>
<td>cent</td>
<td>¢</td>
<td>&amp;#162;</td>
</tr>
<tr>
<td>£</td>
<td>pound</td>
<td>£</td>
<td>&amp;#163;</td>
</tr>
<tr>
<td>¥</td>
<td>yen</td>
<td>¥</td>
<td>&amp;#165;</td>
</tr>
<tr>
<td>€</td>
<td>euro</td>
<td>€</td>
<td>&amp;#8364;</td>
</tr>
<tr>
<td>©</td>
<td>copyright</td>
<td>©</td>
<td>&amp;#169;</td>
</tr>
<tr>
<td>®</td>
<td>registered trademark</td>
<td>®</td>
<td>&amp;#174;</td>
</tr>
</tbody>
</table>

**Note:** Entity names are case sensitive.

[https://www.w3schools.com/html/html_entities.asp](https://www.w3schools.com/html/html_entities.asp)
**rowspan**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>X</td>
<td>Y</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**colspan**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>
Styling HTML with CSS

CSS stands for Cascading Style Sheets.

CSS describes **how HTML elements are to be displayed on screen, paper, or in other media.**

CSS saves a lot of work. It can control the layout of multiple web pages all at once.

CSS can be added to HTML elements in 3 ways:

- **Inline** - by using the style attribute in HTML elements
- **Internal** - by using a `<style>` element in the `<head>` section
- **External** - by using an external CSS file

The most common way to add CSS, is to keep the styles in separate CSS files. However, here we will use inline and internal styling, because this is easier to demonstrate, and easier for you to try it yourself.

https://www.w3schools.com/html/html_css.asp
most specific color: blue;

Inline CSS

An inline CSS is used to apply a unique style to a single HTML element.

An inline CSS uses the style attribute of an HTML element.

This example sets the text color of the <h1> element to blue:

```
<h1 style="color:blue;">This is a Blue Heading</h1>
```
Internal CSS

An internal CSS is used to define a style for a single HTML page.

An internal CSS is defined in the `<head>` section of an HTML page, within a `<style>` element:

Example

```
<!DOCTYPE html>
<html>
<head>
<style>
  body {background-color: powderblue;}
  h1 {color: blue;}
  p {color: red;}
</style>
</head>
<body>
  <h1>This is a heading</h1>
  <p>This is a paragraph.</p>
</body>
</html>
```
External CSS

An external style sheet is used to define the style for many HTML pages.

With an external style sheet, you can change the look of an entire web site, by changing one file!

To use an external style sheet, add a link to it in the <head> section of the HTML page:

Example

```html
<!DOCTYPE html>
<html>
<head>
  <link rel="stylesheet" href="styles.css">
</head>
<body>
  <h1>This is a heading</h1>
  <p>This is a paragraph.</p>
</body>
</html>
```
An external style sheet can be written in any text editor. The file must not contain any HTML code, and must be saved with a .css extension.

Here is how the "styles.css" looks:

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

h1 {
    color: blue;
}

p {
    color: red;
}
```
CSS Fonts

The CSS **color** property defines the text color to be used.

The CSS **font-family** property defines the font to be used.

The CSS **font-size** property defines the text size to be used.

---

**Example**

```html
<!DOCTYPE html>
<html>
<head>
<style>
   h1 {
      color: blue;
      font-family: verdana;
      font-size: 300%;
   }
   p {
      color: red;
      font-family: courier;
      font-size: 160%;
   }
</style>
</head>
<body>
   <h1>This is a heading</h1>
   <p>This is a paragraph.</p>
</body>
</html>
```

---

There are two kinds of length units: absolute and relative. **Absolute** units theoretically correspond to a unit of measure in the real world, such as an inch, a centimeter, or a point. **Relative** units are based on some more arbitrary unit of measure.
<table>
<thead>
<tr>
<th>Unit</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>em</td>
<td>Relative; height of the element’s font</td>
</tr>
<tr>
<td>ex</td>
<td>Relative; height of x character in the element’s font</td>
</tr>
<tr>
<td>px</td>
<td>Relative; pixels, which are relative to the viewing device</td>
</tr>
<tr>
<td>in</td>
<td>Absolute; inches</td>
</tr>
<tr>
<td>cm</td>
<td>Absolute; centimeters</td>
</tr>
<tr>
<td>mm</td>
<td>Absolute; millimeters</td>
</tr>
<tr>
<td>pt</td>
<td>Absolute; points</td>
</tr>
<tr>
<td>pc</td>
<td>Absolute; picas</td>
</tr>
<tr>
<td>rem</td>
<td>Relative; height of the root element’s font (new in CSS3)</td>
</tr>
<tr>
<td>vh</td>
<td>Relative; percent of the viewport height (new in CSS3)</td>
</tr>
<tr>
<td>vw</td>
<td>Relative; percent of the viewport width (new in CSS3)</td>
</tr>
</tbody>
</table>
CSS Units

CSS has several different units for expressing a length.

Many CSS properties take "length" values, such as width, margin, padding, font-size, border-width, etc.

Length is a number followed by a length unit, such as 10px, 2em, etc.

A whitespace cannot appear between the number and the unit. However, if the value is 0, the unit can be omitted.

For some CSS properties, negative lengths are allowed.

There are two types of length units: relative and absolute.
Relative Lengths

Relative length units specify a length relative to another length property. Relative length units scale better between different rendering mediums.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>em</td>
<td>Relative to the font-size of the element (2em means 2 times the size of the current font)</td>
</tr>
<tr>
<td>ex</td>
<td>Relative to the x-height of the current font (rarely used)</td>
</tr>
<tr>
<td>ch</td>
<td>Relative to width of the &quot;0&quot; (zero)</td>
</tr>
<tr>
<td>rem</td>
<td>Relative to font-size of the root element</td>
</tr>
<tr>
<td>vw</td>
<td>Relative to 1% of the width of the viewport*</td>
</tr>
<tr>
<td>vh</td>
<td>Relative to 1% of the height of the viewport*</td>
</tr>
<tr>
<td>vmin</td>
<td>Relative to 1% of viewport's* smaller dimension</td>
</tr>
<tr>
<td>vmax</td>
<td>Relative to 1% of viewport's* larger dimension</td>
</tr>
<tr>
<td>%</td>
<td></td>
</tr>
</tbody>
</table>

Tip: The em and rem units are practical in creating perfectly scalable layout!
* Viewport = the browser window size. If the viewport is 50cm wide, 1vw = 0.5cm.

https://www.w3schools.com/cssref/css_units.asp
Absolute Lengths

The absolute length units are fixed and a length expressed in any of these will appear as exactly that size.

Absolute length units are not recommended for use on screen, because screen sizes vary so much. However, they can be used if the output medium is known, such as for print layout.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm</td>
<td>centimeters</td>
</tr>
<tr>
<td>mm</td>
<td>millimeters</td>
</tr>
<tr>
<td>in</td>
<td>inches (1in = 96px = 2.54cm)</td>
</tr>
<tr>
<td>px *</td>
<td>pixels (1px = 1/96th of 1in)</td>
</tr>
<tr>
<td>pt</td>
<td>points (1pt = 1/72 of 1in)</td>
</tr>
<tr>
<td>pc</td>
<td>picas (1pc = 12 pt)</td>
</tr>
</tbody>
</table>

* Pixels (px) are relative to the viewing device. For low-dpi devices, 1px is one device pixel (dot) of the display. For printers and high resolution screens 1px implies multiple device pixels.
Color Names Supported by All Browsers

All modern browsers support the following 140 color names (click on a color name, or a hex value, to view the color as the background-color along with different text colors):

For a full overview of CSS colors, visit our colors tutorial.

<table>
<thead>
<tr>
<th>Color Name</th>
<th>HEX</th>
<th>Color</th>
<th>Shades</th>
<th>Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>AliceBlue</td>
<td>#FOF8FF</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>AntiqueWhite</td>
<td>#FAEBD7</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Aqua</td>
<td>#00FFFF</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Aquamarine</td>
<td>#7FFFDD4</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Azure</td>
<td>#F0FFFF</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Beige</td>
<td>#F5F5DC</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Bisque</td>
<td>#FFE4C4</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Black</td>
<td>#000000</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>BlanchedAlmond</td>
<td>#FFEBBD</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Blue</td>
<td>#0000FF</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>BlueViolet</td>
<td>#8A2BE2</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>Brown</td>
<td>#A52A2A</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
<tr>
<td>BurlyWood</td>
<td>#DEB887</td>
<td></td>
<td>Shades</td>
<td>Mix</td>
</tr>
</tbody>
</table>
Mix two colors and see the result.

Select colors:

Top color: #66FFFF
Submit

Bottom color: #BDF8D
Submit

https://www.w3schools.com/colors/colors_mixer.asp?colorbottom=F0F8FF&colortop=FFFFFF
## Color Converter

### Enter a Color:

- **name, hex, rgb, hsl, hwb, cmyk, ncol:**

<table>
<thead>
<tr>
<th>Name</th>
<th>DeepSkyBlue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rgb</strong></td>
<td>rgb(0, 191, 255)</td>
</tr>
<tr>
<td><strong>Hex</strong></td>
<td>#00bfff</td>
</tr>
<tr>
<td><strong>Hsl</strong></td>
<td>hsl(195, 100%, 50%)</td>
</tr>
<tr>
<td><strong>Hwb</strong></td>
<td>hwb(195, 0%, 0%)</td>
</tr>
<tr>
<td><strong>Cmyk</strong></td>
<td>cmyk(100%, 25%, 0%, 0%)</td>
</tr>
<tr>
<td><strong>Ncol</strong></td>
<td>C25, 0%, 0%</td>
</tr>
</tbody>
</table>

[Use this color in our Color Picker](https://www.w3schools.com/colors/colors_converter.asp)
Colors HEX

Hex Calculator

#ff0000
rgb(255, 0, 0)
hs1(0, 100%, 50%)

https://www.w3schools.com/colors/colors_hexadecimal.asp
CSS :hover Selector

Example
Select and style a link when you mouse over it:

```css
a:hover {
  background-color: yellow;
}
```

More "Try it Yourself" examples below.

Definition and Usage
The :hover selector is used to select elements when you mouse over them.

**Tip:** The :hover selector can be used on all elements, not only on links.

**Tip:** Use the :link selector to style links to unvisited pages, the :visited selector to style links to visited pages, and the :active selector to style the active link.

**Note:** :hover MUST come after :link and :visited (if they are present) in the CSS definition, in order to be effective!

https://www.w3schools.com/cssref/sel_hover.asp
CSS :link Selector

Example

Select and style unvisited links:

```css
a:link {
    background-color: yellow;
}
```

More "Try it Yourself" examples below.

Definition and Usage

The :link selector is used to select unvisited links.

**Note:** The :link selector does not style links you have already visited.

**Tip:** Use the :visited selector to style links to visited pages, the :hover selector to style links when you mouse over them, and the :active selector to style links when you click on them.
<a href="https://www.w3schools.com">W3Sschools</a>
<a href="http://www.wikipedia.org">Wikipedia</a>

<p><b>Note:</b> The :link selector style links to pages you have not visited yet.</p>
CSS :visited Selector

Example

Select and style visited links:

```css
a:visited {
    color: pink;
}
```

Try it Yourself »

More "Try it Yourself" examples below.

Definition and Usage

The :visited selector is used to select visited links.

Tip: Use the :link selector to style links to unvisited pages, the :hover selector to style links when you mouse over them, and the :active selector to style links when you click on them.

Browsers limits the styles that can be set for a:visited links, due to security issues.

https://www.w3schools.com/cssref/sel_visited.asp
<!DOCTYPE html>
<html>
<head>
<style>
  a:visited {
    color: pink;
  }
</style>
</head>
<body>

<a href="https://www.w3schools.com">W3Schools Home</a><br>
<a href="https://www.w3schools.com/html/">W3Schools HTML Tutorial</a><br>
<a href="https://www.w3schools.com/css/">W3Schools CSS Tutorial</a>

<p><b>Note:</b> The :visited selector style links to pages you have already visited.</p>

</body>
</html>
The **:active** CSS pseudo-class represents an element (such as a button) that is being activated by the user. When using a mouse, "activation" typically starts when the user presses down the primary mouse button and ends when it is released. The :active pseudo-class is commonly used on `<a>` and `<button>` elements, but may be used on other elements, too.

```css
/* Selects any <a> that is being activated */
*a:active {
  color: red;
}
```

Styles defined by the :active pseudo-class will be overridden by any subsequent link-related pseudo-class (:link, :hover, or :visited) that has at least equal specificity. To style links appropriately, put the :active rule after all other link-related rules, as defined by the LVHA-order: :link — :visited — :hover — :active.

**Note:** On systems with multi-button mice, CSS3 specifies that the :active pseudo-class must only apply to the primary button; on right-handed mice, this is typically the leftmost button.