



Intro to HTML and CSS

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Goals

Walk away with the foundations for :

- Understanding how tags and other HTML elements structure the content of a webpage
- Being able to create a basic webpage using HTML and CSS
- Understanding how CSS interacts with HTML
- Developing a lifelong appetite for coding!



Commerce Data Academy

- A data education initiative of the Commerce Data Service (CDS).
- Launched by the CDS to offer data science, data engineering, and web development training to employees of the U.S. Department of Commerce.
- Course schedule and materials (e.g. slides, code, papers) produced for the Commerce Data Academy can be found on our website at <http://dataacademy.commerce.gov>.
- Questions? Feel free to write us at Data Academy (dataacademy@doc.gov).



Course Files

If you don't have a copy of the PowerPoint presentation or files, go to my GitHub and download them:

<https://github.com/dcwebmaven/HTML-CSSCourse>



Background Questions

- What is programming?
- What is the difference between websites, web applications, and native applications (mobile or tablet)?
- What is Front End Engineering vs. Back End Engineering?



Front End

- HyperText Markup Language (HTML)
- Cascading Style Sheets (CSS)
- JavaScript



HyperText=text you can click on--hyperlinks

Markup=highlighting parts of content for description

Language=communication (you + computer)

HyperText Markup Language (HTML)



HTML describes the structure of a webpage to your browser.



HTML Tags

```
<h1>This is a headline</h1>
<p>This is a paragraph.</p>
<p>This is a second paragraph.</p>
<p>This is a third paragraph.</p>
```

- Each individual element has its own tag.
- You can write HTML just like normal text and save it in a file with .html at the end.
- HTML is the only thing you *have to have* for a website.



HTML supports many types of media:

<p>

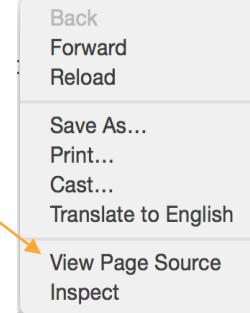
<audio>

<video>

<button>

<article>

Try this:

1. Open up your browser and navigate to your favorite webpage.
2. Right-click (for Windows) or Control+Click (for Mac) then select “View Page Source.”
3. See what tags you can find.



HTML and Cascading Style Sheets (CSS): What's the difference?

HTML is used for **meaning** and CSS is used
for **presentation**.

HTML = fancy structured content
CSS = visual formatting of that content

Let's Get Started

- To get started, go to <http://codepen.com>
- Click on the  button
- You can sign up for an account or just select the “Anonymous user” option



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Try this:

In the “HTML” section, type “Hello World! This is my first webpage.”
Click “Save” to save your work.

The screenshot shows a code editor interface with three panels: HTML, CSS, and JS. The HTML panel contains the text "Hello world! This is my first webpage.". The CSS and JS panels are currently empty. At the top, there is a navigation bar with a user icon, the identifier "rrZqrW", and the text "A PEN BY CAPTAIN ANONYMOUS". On the right side of the navigation bar are buttons for "Save", "Fork", "Settings", "Change View", "Log In", and "Sign Up". Below the panels, a preview window displays the rendered HTML content: "Hello world! This is my first webpage.". At the bottom of the interface, there are tabs for "Console", "Assets", and "Keyboard", along with a note about restdb.io and buttons for "Share" and "Export".

Tags

- Surround content and apply meaning to it
- *Opening tags* <html>
- *Closing tags* </html>
- Not all tags have closing tags
 - Line-break tag

 - Image tag
- Remember: opening tag → content → closing tag



Try this:

Return to your document and type the following:

```
<!DOCTYPE html>
<html>
  <body>
```

This is my first web page.

```
  </body>
</html>
```

Now save the document again, and see what it looks like.



Attributes

- Tags can also have **attributes**
- Attributes appear inside the opening tag
- Values sit inside quotation marks

```
<tag attribute="value">Pudding</tag>
```

Note: Quotation marks aren't always essential but it is a good-practice convention that is recommended for consistency and clarity.



Elements

- Tags mark *beginning and end* of an element
- HTML **element** usually consists of start tag + all the content inserted in-between + end tag:

```
<tagname>Content goes here...</tagname>
```

Examples:

<body>Whatever content is here</body> = body **element**
<title>James Bond</title> = title **element**



Nested Elements

- HTML elements can be nested (elements can contain elements).
- All HTML documents consist of nested HTML elements.
- How many elements do you count on the page you just saved?



Try this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My first web page</title>
  </head>
  <body>
```

This is my first web page.
How exciting!

```
</body>
</html>
```

Save and then view in the browser.



Paragraphs

- <p> is used for **paragraphs**.
- HTML content is like a book.
- You specify document structure.
- Whatever you don't put in won't happen.



Try this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My first web page</title>
  </head>
  <body>

    <p>This is my first web page.</p>
    <p>How exciting!</p>

  </body>
</html>
```

Save and then view in the browser.



Emphasis

**** = emphasize text in paragraph—like italic, but not exactly

**** = indicate strong importance within paragraph—like boldface



Try this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My first web page</title>
  </head>
  <body>
    <p>This is my first web page.</p>
    <p>How exciting!</p>
    <p>Yes, that really <em>is</em> exciting.</p>
    <p><strong>Warning:</strong> Level of excitement may cause head to
      explode.</p>
  </body>
</html>
```

Save and then view in the browser.



Headings

HTML tags specifically designed for headings:

`<h1>`, `<h2>`, `<h3>`, `<h4>`, `<h5>`, `<h6>`

`<h1></h1>` is top heading (only 1 per page)

`<h6></h6>` is lowest heading



Try this:

```
<!DOCTYPE html>
<html>
<head>
<body>

<h1>My first web page</h1>
  <h2>About</h2>
    <p>This is a simple page put together using HTML</p>
  <h2>Purpose of this Page</h2>
    <p>To learn HTML</p>

</body>
</html>
```

Save and then view in the browser.



Lists

There are three types of lists: unordered lists, ordered lists, and description lists.

- **Unordered lists** are used for *non-sequential lists with list items usually preceded by bullets.*
- **Ordered lists** are used for *sequential lists, which are normally represented by incremental numbers.*
- **Description list** is a *list of terms, with a description of each term.*



List Tags

- **** tag is used to define unordered lists.
- **** tag is used to define ordered lists.
- Inside *both* lists, the **** tag is used to define each list item.



Try this:

```
<!DOCTYPE html>
<html>
<head>
<body>
<h1>My first web page</h1>
  <h2>About</h2>
    <p>This is a simple page put together using HTML</p>
  <h2>Purpose of this Page</h2>
    <ul>
      <li>To learn HTML</li>
      <li>To show off</li>
      <li>Because I can</li>
    </ul>
</body>
</html>
```

Save and then view in the browser.



Try this:

```
<!DOCTYPE html>
<html>
<head>
<body>
<h1>My first web page</h1>
  <h2>About</h2>
    <p>This is a simple page put together using HTML</p>
  <h2>Purpose of this Page</h2>
    <ol>
      <li>To learn HTML</li>
      <li>To show off</li>
      <li>Because I can</li>
    </ol>
</body>
</html>
```

Save and then view in the browser.

Try this:

... (Note: Keep the code above this line in your document and just change the portion below)

```
<h2>Purpose of this Page</h2>
<ul>
  <li>To learn HTML</li>
  <li>To show off</li>
    <ol>
      <li>To my boss</li>
      <li>To my friends and acquaintances</li>
      <li>To my guinea pig</li>
    </ol>
    <li>Because I can</li>
  </ul>
</body>
</html>
```

Save and then view in the browser.



Links

- Value of Internet = all **linked** together
- **hypertext** = system of linked text
- **anchor tag** (`<a>`) used to define a link
- **href** = **Hypertext REFerence** (to add **destination** of the link)



Try this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My first web page</title>
  </head>
  <body>
    <h1>My first web page</h1>
    <h2>What this is</h2>
      <p>A simple page put together using HTML</p>
    <h2>Why this is</h2>
      <p>To learn HTML</p>
    <h2>Where to find this tutorial</h2>
      <p><a href="http://dataacademy.commerce.gov/previous-courses.html">Previous Course Materials</a></p>
  </body>
</html>
```



More About Links

- can be **absolute** OR
- **relative**
- do not have to link to another file in same directory
- can send user to another part of the same page they are on

Type in the following:

```
<h2 id="courses">Courses</h2>
```

Then link to it by using something like this:

```
<a href="#courses">Go to previous courses</a>.
```



Images

Everything we've explored so far is very text-centric.

Web is not just about text; it's about images, video, and audio too.

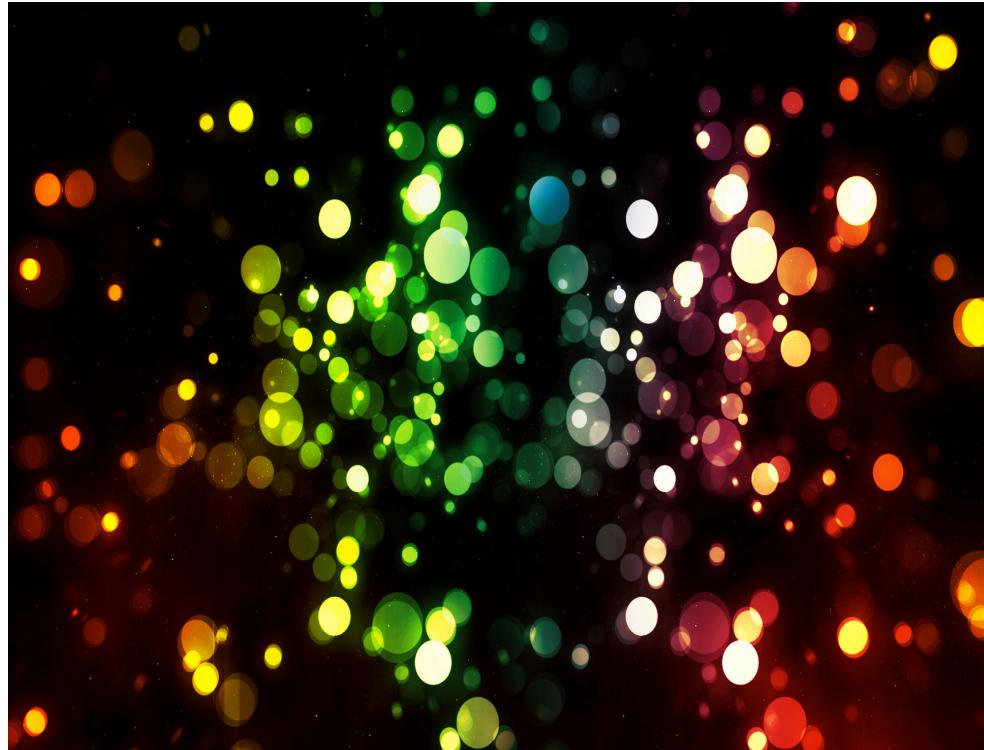




Image Tags

- tag is used to put an image in an HTML document
- Looks like this:

```

```

- No closing tag
- The **src** attribute tells browser where to find image
- Like <a> tag, path can be *absolute*, but usually *relative*.



Try this:

1. Create an image tag for the following image in your codepen.io HTML document.
2. For example, the URL for this kitten image placeholder is:
<http://placekitten.com/200/300> so then the code would be:

```

```

Extra credit: Create a link that takes you to another website that is centered on the image. Good luck!

Tables

- HTML tables = best known for being used and abused to lay out pages.
- Correct use of **tables** = to **structure tabular data**
- **Tables** can contain all sorts of HTML elements: text, images, lists, other tables, etc.

Table Tags

- <table> element defines the table.
- <tr> element defines a **table row**.
- <td> element defines a table **data cell**.
- <th> element defines a **table header cell**.
- <tr> element is a “wrapper” for table cells:
 - All <th> elements must be enclosed inside <tr> tags.
 - All <td> elements must be enclosed in <tr> tags.



Try this:

```
<!DOCTYPE html>
<html>
  <table>
    <tr>
      <th>Column 1 heading</th>
      <th>Column 2 heading</th>
      <th>Column 3 heading</th>
    </tr>
    <tr>
      <td>Row 2, cell 1</td>
      <td>Row 2, cell 2</td>
      <td>Row 2, cell 3</td>
    </tr>
    <tr>
      <td>Row 3, cell 1</td>
      <td>Row 3, cell 2</td>
      <td>Row 3, cell 3</td>
    </tr>
  </table>
</html>
```



Try this:

The best way to fully understand all of this is to play around with the HTML file and see what happens when you change things.

Go to my code pen: <http://codepen.io/dcwebmaven/pen/gwAkxz>

Try to apply some of the styles we discussed in this section. Change things around and see what happens. Good luck!



Cascading Style Sheets (CSS)



CSS

- **CSS**, or **Cascading Style Sheets**, is a way to style and present HTML
- HTML is the **meaning** or **content**, style sheet is the **presentation**
- Styles have a basic format of '**property: value**'
- Most properties can be applied to most HTML tags



Applying CSS

Three ways to apply CSS to HTML: inline, internal, external.

Inline=Inline styles are put directly into HTML tags using style attribute. `<p style="color: red">text</p>`

Internal=Embedded/internal styles are used for whole page.
[Inside `<head>` element, style tags surround all styles for page.]

External=External styles are used for the whole, multiple-page website. [**Separate CSS file** includes all styles for site.]



Internal Styles

- **Internal=**Embedded or internal styles are used for the whole page
- Put style tags *inside* the head element
- Style tags surround all the styles for page



Try this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>CSS Example</title>
    <style>
      p {
        color: red;
      }
      a {
        color: blue;
      }
    </style>
  </head>
  <body>
    <p>This is a paragraph</p>
    <a href="http://commerce.gov">This is a link</a>
  </body>
</html>
```



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Selectors, Properties, and Values

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

```
<style>  
    p {  
        color: red;  
    }  
    a {  
        color: blue;  
    }  
</style>
```



Linking to External Style Sheets

- File saved as “style.css” in same directory as HTML page
- Can be linked to in HTML like this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>CSS Example</title>
    <link rel="stylesheet" type="text/css" href="style.css"> ...
```



Length and Percentages

- **px** (such as font-size: 14px) = unit for pixels
- **em** (such as font-size: 4em) = unit for calculated size of font
- **pt** (such as font-size: 12pt) = unit for points, measurements in printed media
- **%** (such as width: 80%) = unit for percentages
- Other units include **pc** (picas), **cm** (centimeters), **mm** (millimeters) and **in** (inches)

Example:

```
body {  
    font-size: 14px;  
    color: navy;  
}
```

When value is **zero**, you do not need to specify a unit
To specify no border, it would be border: 0



Colors

Use predefined name, RGB value, or hex code

Name: aqua, black, blue, fuchsia, gray, green, red, yellow, etc.

RGB: (red/green/blue) values of combinations between 0 and 255
0 = lowest level (no red) – 255 = highest level (full red)

Example: `rgb(255,0,0)`
`rgb(100%,0%,0%)`

Hex code: starts with a hash character (#) + can be three or six digits in length.

Example: `#ff0000`
`#f00`



Try this:

Green text on a yellow background could look like this:

```
h1 {  
  color: green;  
  background-color: yellow;  
}
```

You can apply color and background properties to most HTML elements:

```
body {  
  font-size: 14px;  
  color: navy;  
}  
  
h1 {  
  color: #ffc;  
  background-color: #009;  
}
```

Experiment with color and background-color to find the right combination for your web page.



Text

Change size & shape of text on web page with these properties:

Font-family = font itself, such as Times New Roman, Arial, or Verdana

Font-size = actual size of font

Font-weight = thickness of font and whether it's bold or not

Font-style = whether the text is italic or not

Text-decoration = if text has got a line running under, over, or through it

Text-transform = changes text case (capital, lowercase, uppercase, none)

Text, cont'd.

- **letter-spacing** and **word-spacing** properties = spacing between letters or words
- **line-height** property sets height of lines in element, without adjusting size of font (number, a length, a percentage, or normal)
- **text-align** property will align text to left, right, center, or justify
- **text-indent** property will indent the first line of a paragraph to a given length or percentage

Margins, Padding, and Borders

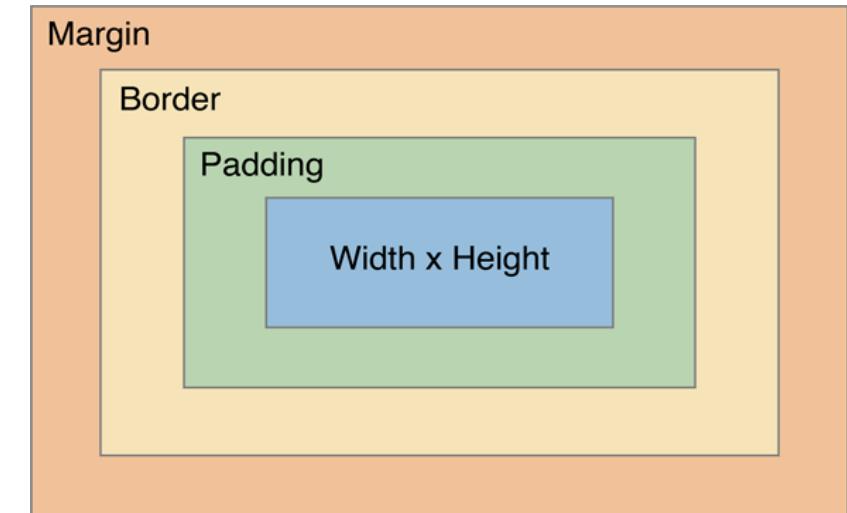
Margin is space **outside** something

Padding is space **inside** something

Sides of an element can also be set individually:

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

padding-top, padding-right, padding-bottom, and padding-left



Borders can be applied to most HTML elements within the body



Try this:

The best way to fully understand all of this is to play around with the HTML and CSS files and see what happens when you change things.

Go to my code pen:

<http://codepen.io/dcwebmaven/pen/rrZqrW>

Try to apply some of the styles we discussed in this section. Change things around and see what happens. Good luck!



Tools

Experiment:

<http://www.codepen.com>

**Developer Tools in Chrome Browser:

<https://developers.google.com/web/tools/chrome-devtools/?hl=en>

Developer Tools in Firefox:

https://developer.mozilla.org/en-US/docs/Tools/Tools_Toolbox

Developer Tools in Microsoft Edge:

<https://developer.microsoft.com/en-us/microsoft-edge/platform/documentation/f12-devtools-guide/>

**Recommended



Free Online Learning Resources

<http://www.w3schools.com/>

<https://www.codecademy.com/>

<https://www.coursera.org/courses?languages=en&query=programming>

<https://www.edx.org/>

<https://www.khanacademy.org/>

<https://www.freecodecamp.com/>

<http://www.html5rocks.com/en/>



Questions?