THE FRONTEND ENVIRONMENT

HTML/CSS/JAVASCRIPT

10 Minute HTML

OVERVIEW OF KEY HTML CONCEPTS

Every documents begins thus:

`<!DOCTYPE html>`

General syntax

`<tag>...</tag>`

...where there is no content between tags

`<tag />`

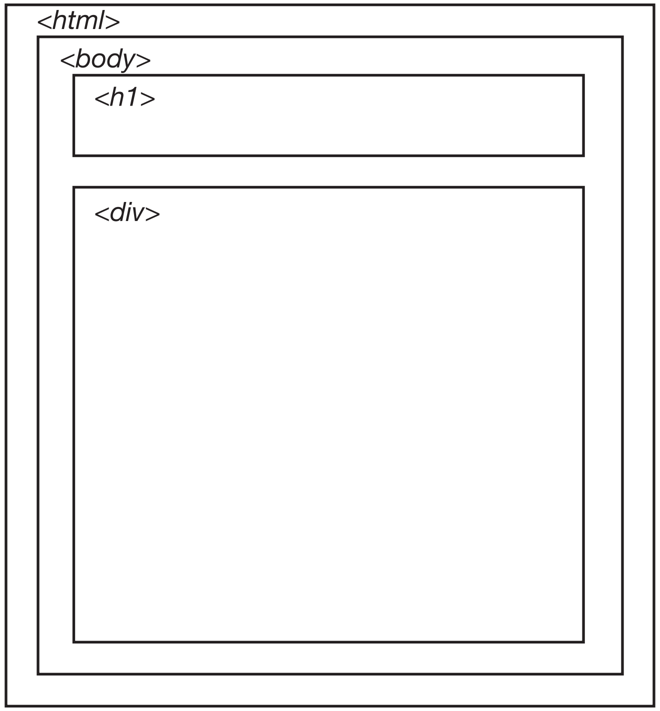
Comments are ignored by browser for rendering

`<!-- ... -->`

Tags are nested to create hierarchy in the document

```
<!DOCTYPE html>
<html>
  <head>
  ...
  </head>
  <body>
    <h1>Hello World</h1>
     <div>...</div>
  </body>
</html>
```

OVERVIEW OF KEY HTML CONCEPTS

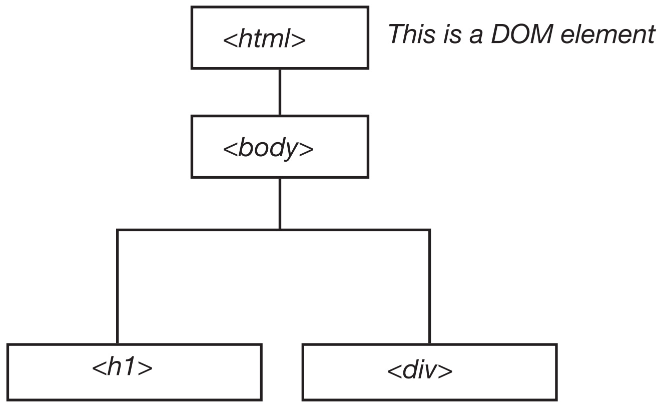


Tags are nested to create hierarchy in the document

```
<!DOCTYPE html>
<html>
  <head>
  ...
  </head>
  <body>
    <h1>Hello World</h1>
    <div>...</div>
  </body>
</html>
```

OVERVIEW OF KEY HTML CONCEPTS

The same document hierarchy can be visualized like this--commonly called the **DOM tree**:



```
<!DOCTYPE html>
<html>
  <head>
  ...
  </head>
  <body>
    <h1>Hello World</h1>
    <div>...</div>
  </body>
</html>
```

The DOM tree is made up of **DOM elements**.

OVERVIEW OF KEY HTML CONCEPTS

Tags can have attributes, class, and/or id

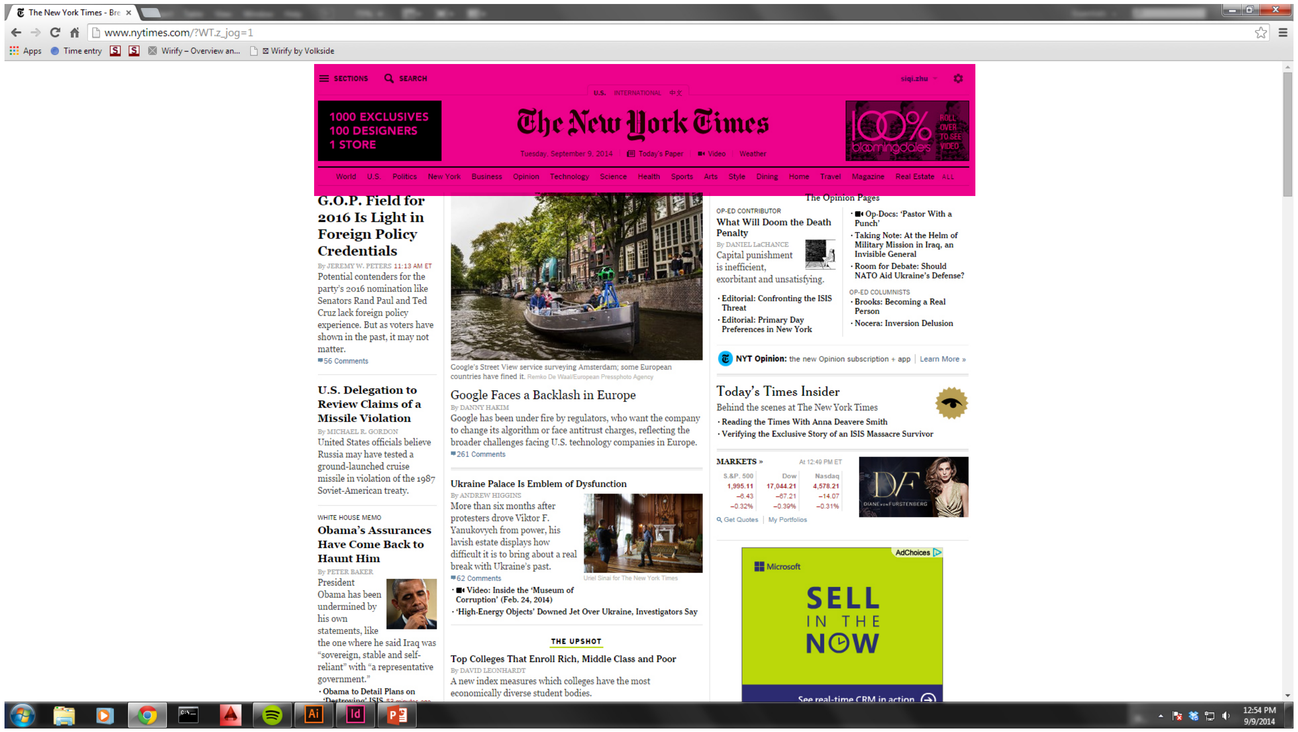
attribute *class*

```
<a href="http://www.github.com" class="button"
id="special"> Link to Github </a>
```

id

attribute	Defines a key property for an element e.g. where does a link take you to
class	Defines a group of elements with similar styles and/or semantic role
id	Defines a specific element; only one allowed per document

HTML IN ACTION


The New York Times - Bre

www.nytimes.com/?WT.z_jog=1

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G.O.P. Field for 2016 Is Light in Foreign Policy Credentials
By JEREMY W. PETERS 11:13 AM ET
Potential contenders for the party's 2016 nomination like Senators Rand Paul and Ted Cruz lack foreign policy experience. But as voters have shown in the past, it may not matter.
56 Comments

U.S. Delegation to Review Claims of a Missile Violation
By MICHAEL R. GORDON
United States officials believe Russia may have tested a ground-launched cruise missile in violation of the 1987 Soviet-American treaty.

WHITE HOUSE MEMO
Obama's Assurances Have Come Back to Haunt Him
By PETER BAKER
President Obama has been undermined by his own statements, like the one where he said Iraq was "sovereign, stable and self-reliant" with "a representative government."
· Obama to Detail Plans on 'Destroying' ISIS 53 minutes ago

Google's Street View service surveying Amsterdam; some European countries have fined it. Remko De Waal/European Pressphoto Agency

Google Faces a Backlash in Europe
By DANNY HAKIM
Google has been under fire by regulators, who want the company to change its algorithm or face antitrust charges, reflecting the broader challenges facing U.S. technology companies in Europe.
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Ukraine Palace Is Emblem of Dysfunction
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Uriel Sinai for The New York Times
· Video: Inside the 'Museum of Corruption' (Feb. 24, 2014)
· 'High-Energy Objects' Downed Jet Over Ukraine, Investigators Say

THE UPSHOT
Top Colleges That Enroll Rich, Middle Class and Poor
By DAVID LEONHARDT
A new index measures which colleges have the most economically diverse student bodies.

The Opinion Pages

OP-ED CONTRIBUTOR
What Will Doom the Death Penalty
By DANIEL LaCHANCE
Capital punishment is inefficient, exorbitant and unsatisfying.
· Editorial: Confronting the ISIS Threat
· Editorial: Primary Day Preferences in New York
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· Room for Debate: Should NATO Aid Ukraine's Defense?
OP-ED COLUMNISTS
· Brooks: Becoming a Real Person
· Nocera: Inversion Delusion

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Today's Times Insider
Behind the scenes at The New York Times
· Reading the Times With Anna Deavere Smith
· Verifying the Exclusive Story of an ISIS Massacre Survivor

MARKETS » At 12:49 PM ET

S.&P. 500	Dow	Nasdaq
1,995.11	17,044.21	4,578.21
−6.43	−67.21	−14.07
−0.32%	−0.39%	−0.31%

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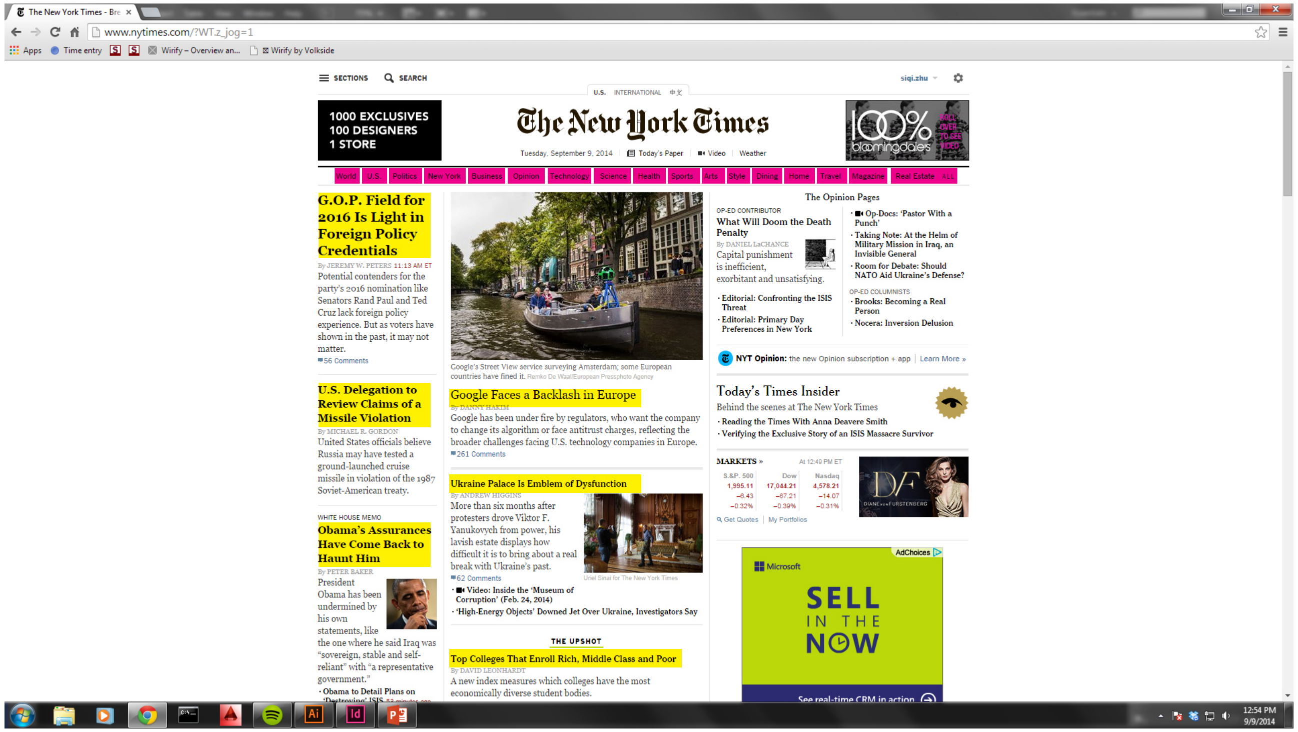
DVF DIANE von FURSTENBERG

AdChoices · Microsoft · SELL IN THE NOW · See real-time CRM in action

12:54 PM 9/9/2014

■ `<header class="mast-head" id="mast-head" role="banner">...</header>`

HTML IN ACTION



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See real-time CRM in action

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■ `<li class="shortcuts">...</li>`

■ `<h2 class="story-heading">...</h2>`

OVERVIEW OF KEY HTML CONCEPTS

Tags can have attributes, class, and/or id

attribute *class*

```
<a href="http://www.github.com" class="button"
id="special"> Link to Github </a>
```

id

Comprehensive reference here:
http://www.w3schools.com/tags/default.asp

LET'S RUN THROUGH SOME COMMON TAGS

`<body>`

`<ul>`

`<li>`

`<   >` Defines a hyperlink

`<   >` Contains elements like `<script>` or `<link>`

`<   >` Contains introductory content, such as navigation

`<   >` Body paragraph text

`<   >` A grouping of elements; a section or division in the document

`<   >` A grouoping of in-line elements

`<img>`

LET'S RUN THROUGH SOME COMMON TAGS

`<body>`	Contains all the contents of the page
`<a>`	Defines a hyperlink
`<head>`	Contains elements like `<script>` or `<link>`
`<header>`	Contains introductory content, such as navigation
`<p>`	Body paragraph text
`<ul>`	Unordered (bulleted) list
`<li>`	Item in a list
`<div>`	A grouping of elements; a section or division in the document
`<span>`	A grouoping of in-line elements
`<img>`	Image

In-class Exercise 0

Mark up a page yourself - a hypothetical student/staff directory for the class

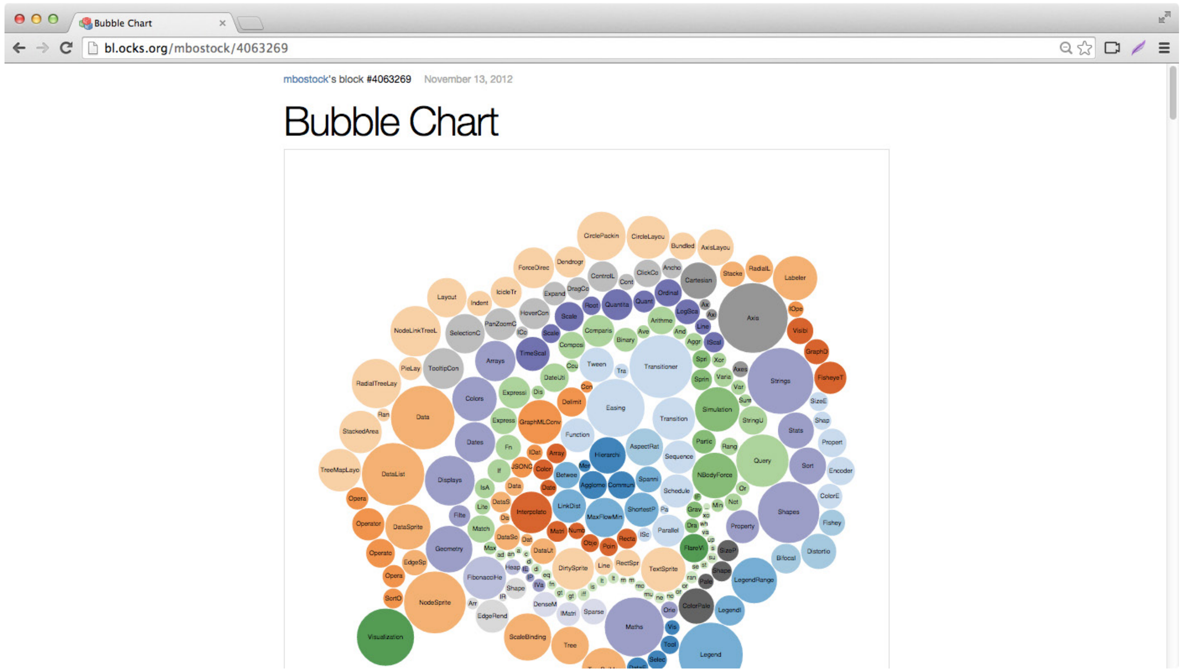
Afterwards, using command line, navigate to the folder and run the command:

```
python -m SimpleHTTPServer
```

or

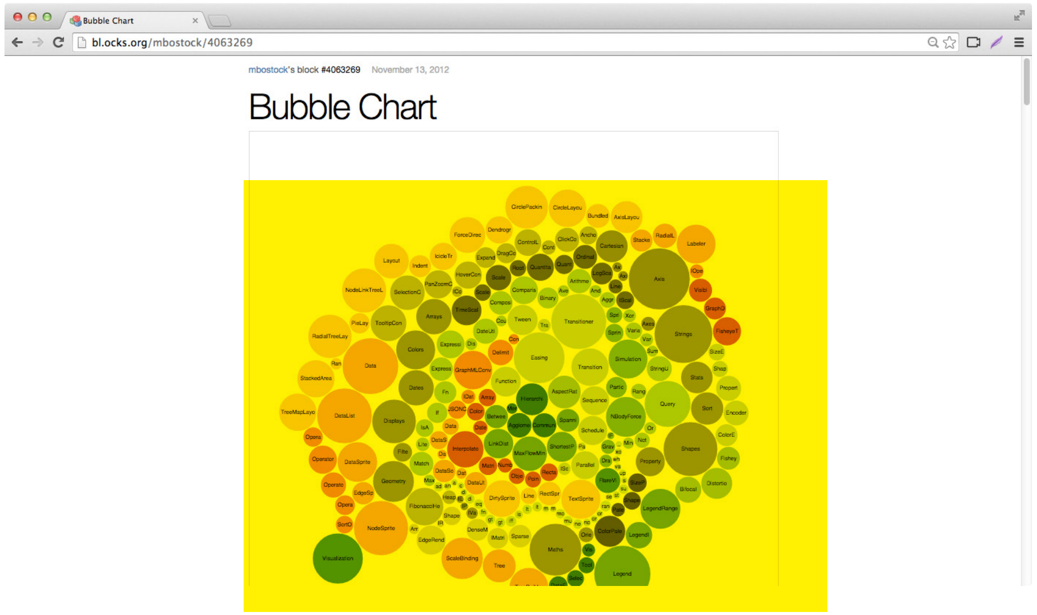
`python -m http.server` if you are running version 3

HOW IS THIS RELATED TO DATA VISUALIZATION?


Bubble Chart
bl.ocks.org/mbostock/4063269
mbostock's block #4063269 November 13, 2012
Bubble Chart

http://bl.ocks.org/mbostock/4063269

HOW IS THIS RELATED TO DATA VISUALIZATION?


Bubble Chart
bl.ocks.org/mbostock/4063269
mbostock's block #4063269 November 13, 2012
Bubble Chart

In D3 visualization, data is represented by DOM elements.

```
<!DOCTYPE html>
<html>
  <head>
  ...
  </head>
  <body>
    <h1>Bubble Chart</h1>
    ...
    <div>
      <svg>
        ...
        <circle />
        <circle />
        ...
      </svg>
    </div>
  </body>
</html>
```

PRACTICAL CSS

HOW IS EVERYTHING RELATED?

JavaScript

"Behavior"

All the dynamic stuff, such as animation, user interaction, manipulating DOM elements...

HTML

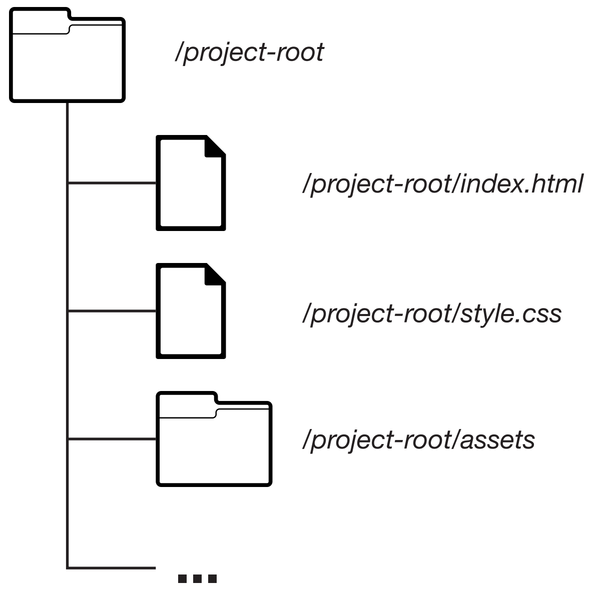
"Content"

CSS

"Style"

Controls the appearance of HTML DOM elements

ORGANIZING THE DIRECTORY



INCLUDING THE STYLESHEET

/project-root/index.html

```
<!DOCTYPE html>
<html>
  <head>
    <title>Hello World</title>
    <meta charset="utf-8" />
    <link href="style.css" 
rel="stylesheet" />
  </head>
  <body>
    ...
  </body>
</html>
```

/project-root/style.css

```
/*style.css*/
```

NOT A COMPREHENSIVE CSS COURSE, BUT...

Basic CSS syntax

Selectors
- Inheritance and specificity

Basic styling
- The box model
- Size and position
- Font and color

Best practice hints and tips

BASIC CSS SYNTAX

```
[selector]{
    [property-name] : [property-value];
}
```

selector

```
body {
    background: rgb(250,250,250);
    font-size: 14px;
    width: 100%;
    height: 100%;
    margin: 0;
    padding: 0;
}
```

SELECTORS

by element

```
p{
   font-family: Helvetica, Arial, sans-serif;
   font-size: 0.8em;
}
```

by class

```
.sub-heading{
   font-size: 1.2em;
}
```

by id

```
#mast-head{
   width: 800px;
}
```

SELECTORS

HTML

```
<h1 class="“intro”" id=“header”>Hello World</h1>
```

CSS

```
h1{
    color: #03afeb;
    margin-bottom: 10px;
}
```

SELECTORS

HTML

```
<h1 class=“intro” id=“header”>Hello World</h1>
```

CSS

```
.intro{
   color: #03afeb;
   margin-bottom: 10px;
}
```

```
#header{
   color: #03afeb;
   margin-bottom: 10px;
}
```

SELECTORS

HTML

```
<h1 class=“intro” id=“header”>Hello World</h1>
```

CSS

```
h1.intro{
    color: #03afeb;
    margin-bottom: 10px;
}
```

LET'S GET OUR HANDS DIRTY: COLOR, BACK-GROUND, FONTS, BORDER, MARGINS, PADDING

http://www.cssdesk.com/

SELECTORS

HTML

```
<h1 class=“intro” id=“header”>Hello World</h1>
```

CSS

```
h1{
   margin-bottom: 10px;
}
...
.intro{
   color: #03afeb;
}
```

SELECTORS

Non-conflicting properties will combine.

But what if multiple selectors apply to the same object, and they conflict?

SELECTORS: INHERITANCE & SPECIFICITY

HTML

```
<div class= “featured”>
   <h2>Featured product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
.featured{
   color: rgb(255,0,0);
}
```

Everything under .featured, including <h2> and <p>, will inherit this property

INHERITANCE & SPECIFICITY

HTML

```
<div class= “featured”>
   <h2>Featured product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
.featured{
   color: rgb(255,0,0);
}
.featured p{
   color: rgb(0,0,0);
}
```

This will override the color on featured

WHAT ABOUT THIS?

HTML

```
<div class="featured" id="top-featured">
   <h2>Featured product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
.featured{
   color: rgb(255,0,0);
}
#top-featured{
   color: rgb(0,0,0);
}
```

In general, the more specific selector will override the less specific selector.

But how is this actually determined?

PRIORITY OF SELECTORS (SPECIFICITY)

# of id selectors *# of element selectors*

0, 0, 0, 0

inline or dynamic styles *# of class selectors*

CSS

```
.featured{
   color: rgb(255,0,0);
}
#top-featured{
   color: rgb(0,0,0);
}
```

PRIORITY OF SELECTORS (SPECIFICITY)

HTML

```
<div class=“featured” id=“top-featured”>
   <h2>Featured product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
.featured{
   color: rgb(255,0,0);
}
#top-featured{
   color: rgb(0,0,0);
}
```

0, 0, 1, 0

0, 1, 0, 0

ONE MORE EXAMPLE

HTML

```
<div class="“featured”" id=“top-featured”>
   <h2 class=“featured-heading”>Featured
product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
#top-featured h2{
   color: rgb(255,0,0);
}
.featured-heading{
   color: rgb(0,0,0);
}
```

?

ONE MORE EXAMPLE

HTML

```
<div class="“featured”" id="“top-featured”">
   <h2 class="“featured-heading”">Featured
product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
#top-featured h2{
   color: rgb(255,0,0);
}
.featured-heading{
   color: rgb(0,0,0);
}
```

0, 1, 0, 1

0, 0, 1, 0

ONE MORE EXAMPLE

HTML

```
<div class="featured" id="top-featured">
   <h2 class="featured-heading">Featured
product</h2>
   <p>This product is made from...</p>
</div>
```

CSS

```
#top-featured h2{
   color: rgb(255,0,0);
}
#top-featured .featured-heading{
   color: rgb(0,0,0);
}
```

0, 1, 0, 1

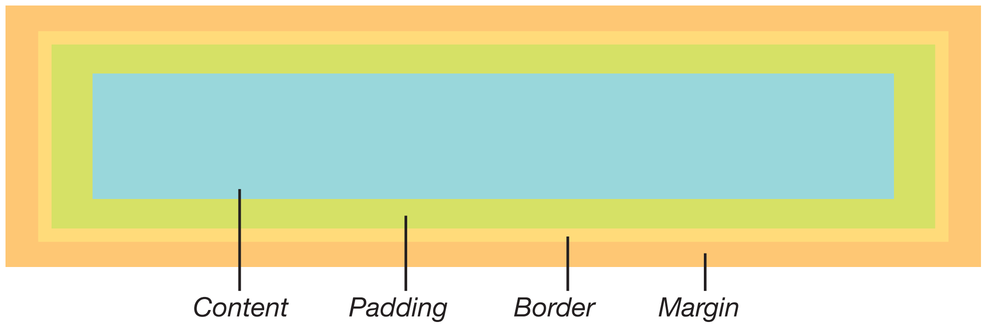
0, 1, 1, 0

BACK TO THE CONSOLE: SEE INHERITANCE IN ACTION

THE BOX MODEL

Every DOM element is a box!

```
<h1>Hello World</h1>
```



THE BOX MODEL

HTML

```
<div class="featured" id="top-featured">
    ...
</div>
```

CSS

```
#top-featured{
   width: 100px;
   border: 1px solid #000;
   padding-left: 5px;
   padding-right: 5px;
}
```

Total box width = width + padding + border

THE BOX MODEL

HTML

```
<div class="“container”>
   <div class=“featured” id=“top-featured”>
      ...
   </div>
</div><!-- .container-->
```

CSS

```
.container{
   width: 100px;
   border: 1px solid #000;
   padding: 0 5px 0 5px;
}
.container .featured{ width: 100%; }
```

POSITIONING THESE BOXES

CSS

```
.container{
   width: 100px;
   border: 1px solid #000;
   padding: 0 5px 0 5px;
   position: relative;
}
```

OBSERVE THE NATURAL STACKING ORDER

Inspect your unstyled document for its document flow

WHAT OTHER POSSIBILITIES ARE THERE?

relative	Position according to normal document flow, then shift using positioning properties e.g. `top` or `left`
absolute	Take out of normal flow, and manually position against the containing element
fixed	Take out of normal flow, and manually position against the window

In-class Exercise

Size and position the various areas of your page

OK, WHAT HAVE WE LEARNED

Basic CSS syntax

Selectors

Elements inherit properties from parent.

Non-conflicting properties combine; conflicts are resolved based on rules of specificity.

Basic styling

Every DOM element is a box ("the box model").

Possible positions (absolute, relative, fixed).

Best practice hints and tips

CSS BEST PRACTICE 1

Don’t Repeat Yourself

CSS BEST PRACTICE 1

Use inheritance wisely

HTML

```
<body>
   <div class= “container”>
      <h1>Title</h1>
      <p>Some text</p>
      <a href= “...”>Go somewhere</a>
   </div>
</body>
```

CSS BEST PRACTICE 1

When you find yourself writing the same style over and over again...combine selectors

CSS

```
p{
   font-size:12px;
}
h5{
   font-size:12px;
}
.featured-text{
   font-size:12px;
}
```

CSS

```
p, h5, .featured-text{
   font-size:12px;
}
```

CSS BEST PRACTICE 1

What is they are only mostly the same?

HTML

```
<div class="“nav-buttons”>
   <a href= “#” class= “button” id= “left”>Left</a>
   <a href= “#” class= “button” id= “right”>right</a>
</div><!-- .container-->
```

CSS

```
.nav-buttons .buttons{
   width: 50px;
   height: 50px;
   position: absolute;
}
```

```
.nav-buttons #left{
   left:0;
}
.nav-buttons #right{
   left: 50px;
}
```

CSS BEST PRACTICE 2

Using shorthands

CSS BEST PRACTICE 3

Centering an element

HOW IS EVERYTHING RELATED?

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All the dynamic stuff, such as animation, user interaction, manipulating DOM elements...

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“Content”

CSS

“Style”

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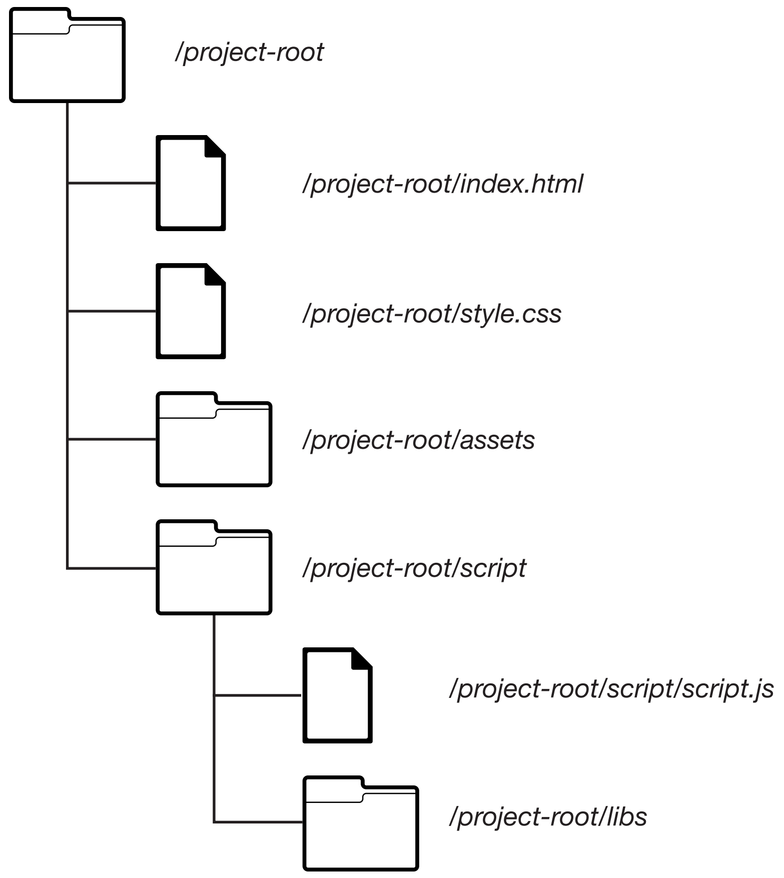


INCLUDING SCRIPTS

/project-root/index.html

```
<!DOCTYPE html>
<html>
  <head>
    <title>Hello World</title>
    <meta charset="utf-8" />
    <link href="style.css"
rel="stylesheet" />
  </head>
  <body>
    ...
     <script ...></script>
  </body>
</html>
```

/project-root/script/script.js

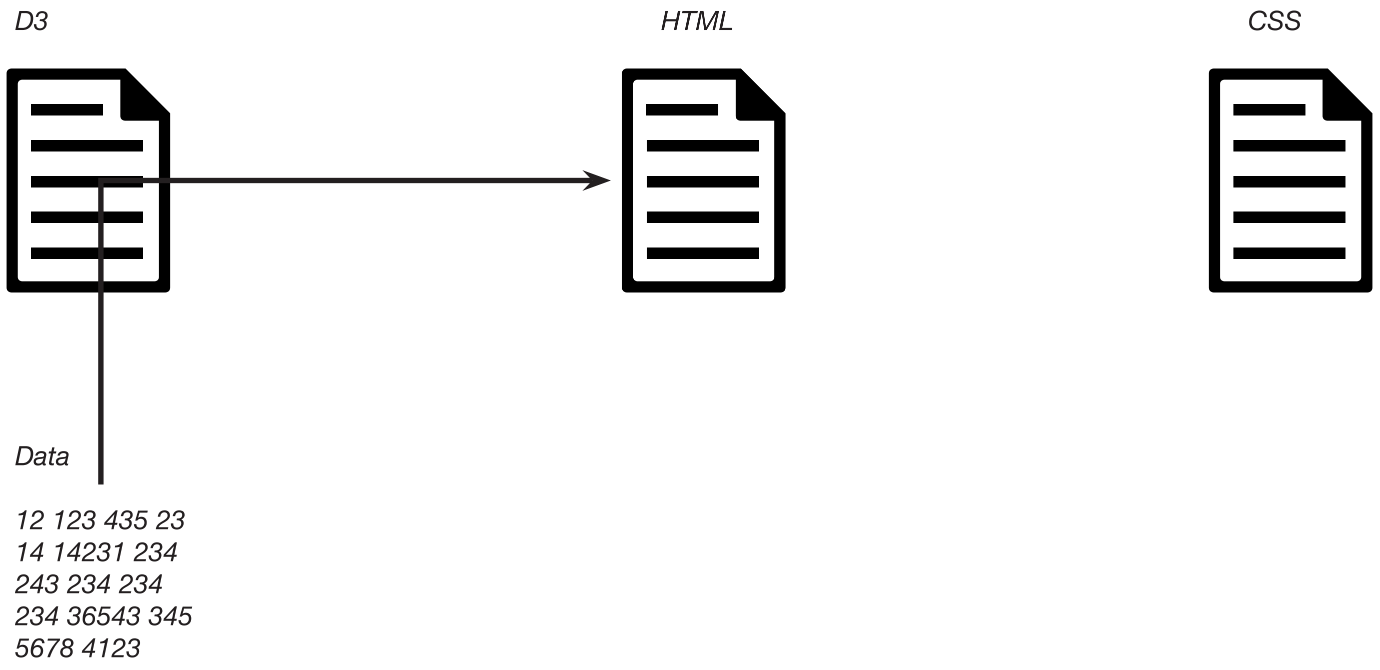
```
//script.js
```

```
<script src= "script/script.js"></script>
```

WHAT CAN A SCRIPT DO?

WHAT ARE LIBRARIES?

INTRO TO D3


D3
HTML
CSS
Data
12 123 435 23
14 14231 234
243 234 234
234 36543 345
5678 4123