



What is HTML?

HYPERTEXT

text which contains links to other texts

1945: Vannevar Bush proposed the Memex, which could create and follow links between documents on microfiche

1989: Tim Berners-Lee proposed Internet-based hypertext system to use and share CERN's information

MARKUP LANGUAGE

```
<!DOCTYPE html>
<html>
  <head>
    <title>Photo Gallery</title>
  </head>
```

Nested elements
that **structure**
content

Image

```
<body>
  <div class="photo">
    <h3>My first photo</h3>
    
  </div>
  ...
</body>
</html>
```

Text

Start → <h3>My first photo</h3> *End*

Name → *Attribute* ↗

```
<!DOCTYPE html>
<html>
  <head>
    <title>Photo Gallery</title>
  </head>
  <body>
    <div class="photo">
      <h3>My first photo</h3>
      
    </div>
    ...
  </body>
</html>
```

head

html

head

title Photo Gallery**title**

head

body

div class="photo"

h3 My first photo**h3**

img src="picture1.jpg"/>

div

...

body

html

body

COMMON HTML TAGS

<div> group elements spanning multiple lines line break before and after

**** group elements within a single line

<p> new paragraph

**
** line break

COMMON HTML TAGS

<h1>, ..., **<h6>** headings

<img src='' images

<a href='' hyperlinks

COMMON HTML TAGS

<table><tr><td> tables

**** unordered list

**** ordered list

<form><input> taking user input

COMMON HTML TAGS

<title> set title that appears in browser

<link> include CSS stylesheets

<script> embed javascript

CodePen

BROWSERS

WEB BROWSER

HTML

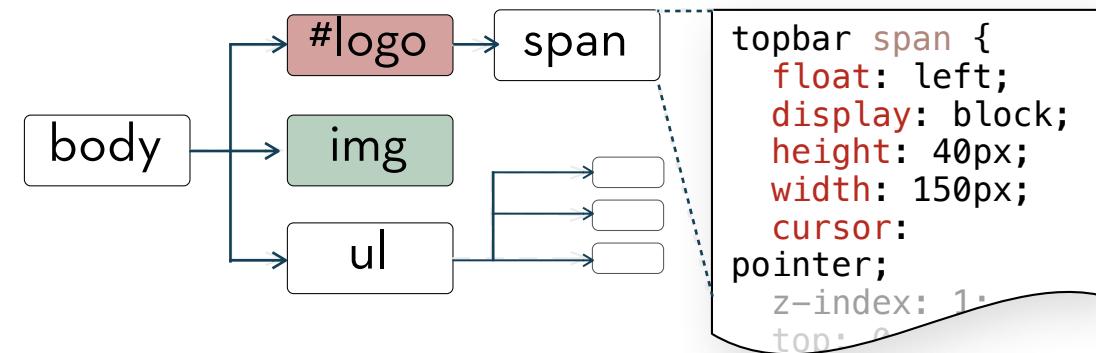
```
http://creativecommons.org
<a><span id="home-button">
</span></a>
<div id="logo">
  <span>
    Creative Commons
  </span>
</div>
```

Resources

cforms.js
creativecommons.css
cc-logo.png

```
//Collap
String.p
function
return
this.re
topbar #home-button{
position: relative;
float: left;
display: b
height: 40px;
width: 150px;
background: url(cc-logo.png) no-repeat center;
```

Document Object Model (DOM)



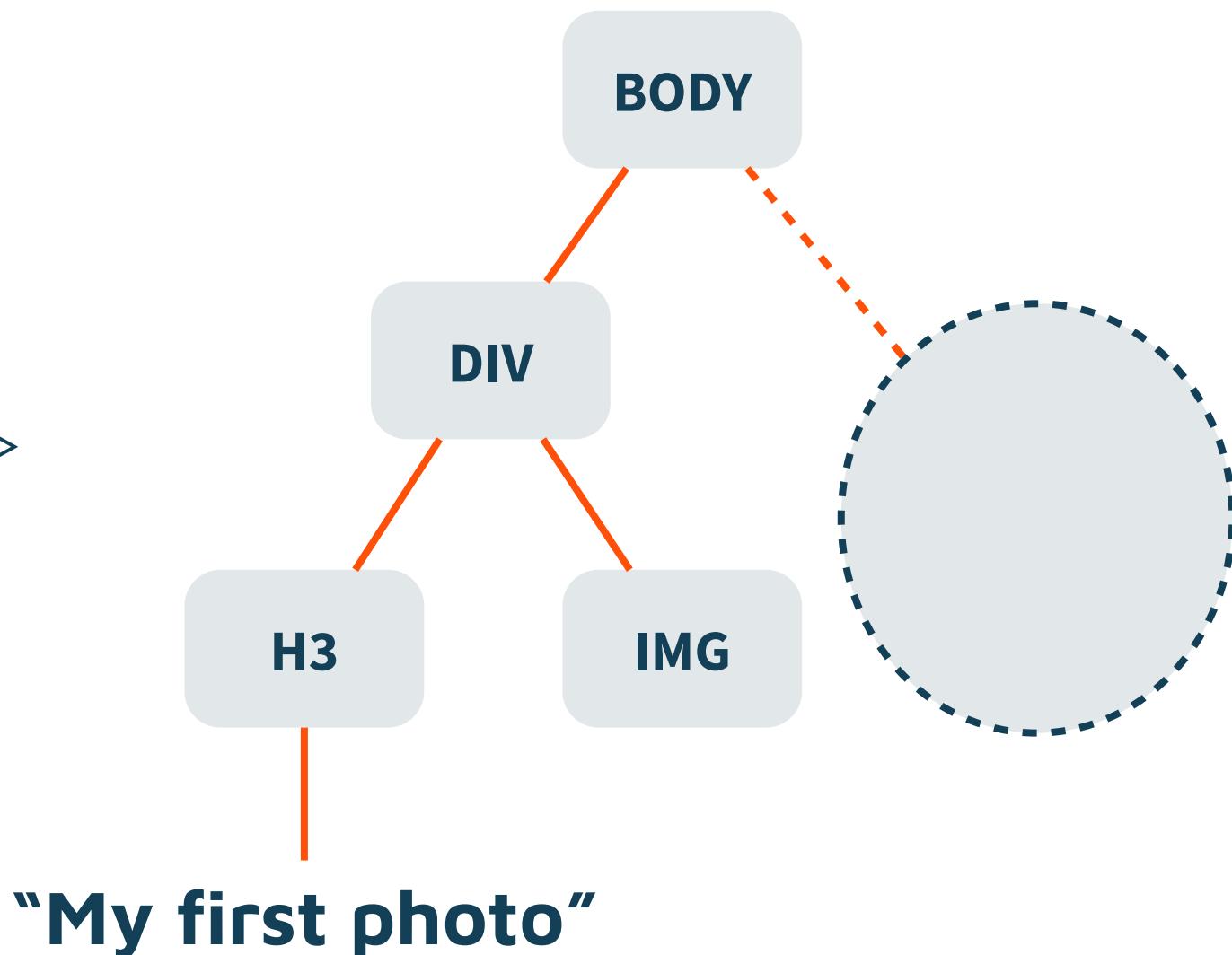
Rendered Page



DOCUMENT OBJECT MODEL

one-to-one correspondence between HTML elements and DOM nodes

```
<body>
  <div class="photo">
    <h3>My first photo</h3>
    
  </div>
...
</body>
```



LAYOUT ENGINE

WebKit

Blink (WebKit fork)

Gecko

Trident

WEB BROWSER

Safari

Chrome, Opera

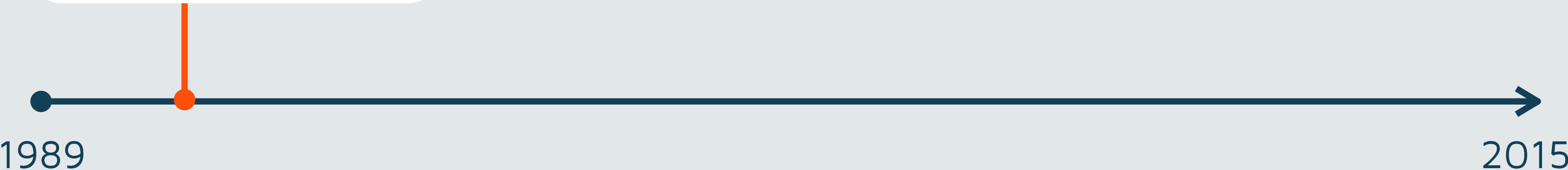
Firefox

Internet Explorer

Timeline

1993: 1st HTML spec

Tim Berners-Lee



Tim Berners-Lee proposed HTML draft to the IETF

Draft referenced Mosaic (Marc Andreessen @ UIUC)

STANDARDS

Internet Engineering Task Force (IETF)

World Wide Web Consortium (W3C)

Web Hypertext Application Technology Working Group (WHATWG)

Timeline

1993: 1st HTML spec

Tim Berners-Lee



1995: HTML 2.0
IETF takes first stab

the IETF created HTMLWG, who created HTML 2

Timeline

1993: 1st HTML spec
Tim Berners-Lee

1997: HTML 3.2
W3C takes over

1989

2015

1995: HTML 2.0
IETF takes first stab

1998: HTML 4
W3C release

Tim Berners-Lee creates the W3C in 1994

Timeline

1993: 1st HTML spec
Tim Berners-Lee

1997: HTML 3.2
W3C takes over

2008: HTML5
working draft

1995: HTML 2.0
IETF takes first stab

1998: HTML 4
W3C release

2014: HTML5
finalized

1989

2015

10 years later — HTML5

Timeline

1998: HTML 4
W3C release

Ten Years of Solitude?

2008: HTML5
working draft

A Tale of Two Working Groups

TOWARDS A CLEANER WEB

Web browsers have forgiving parsers

99% of pages have at least one error

Move HTML from SGML to stricter XML

X for extensibility

XHTML

2000: XHTML 1.0 (HTML 4 as XML and not SGML)

2001: XHTML 1.1

XHTML2: complete departure from HTML 4

Browser vendors were slow to adopt

XHTML SYNTAX

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

All tags must be closed: <p>...</p>,

lower case tags

quotes around attribute values

XHTML LOOPHOLE

Set DOCTYPE to XHTML, MIME type to text/html

Upgrade to XHTML syntax

Browsers interpret document as HTML

Loophole closed in XHTML 1.1

WHATWG

*"The WHATWG was founded by individuals of Apple, the Mozilla Foundation, and Opera Software in 2004, after a W3C workshop. Apple, Mozilla and Opera were becoming increasingly concerned about the W3C's direction with XHTML, lack of interest in HTML and apparent disregard for the needs of real-world authors. So, in response, these organizations set out with a mission to address these concerns and the **Web Hypertext Application Technology Working Group** was born."*

WORK BACKWARDS TO MOVE FORWARDS

understand error-handling done by browsers

HTML parsers should be compatible with
existing Web content

backwards compatibility a must

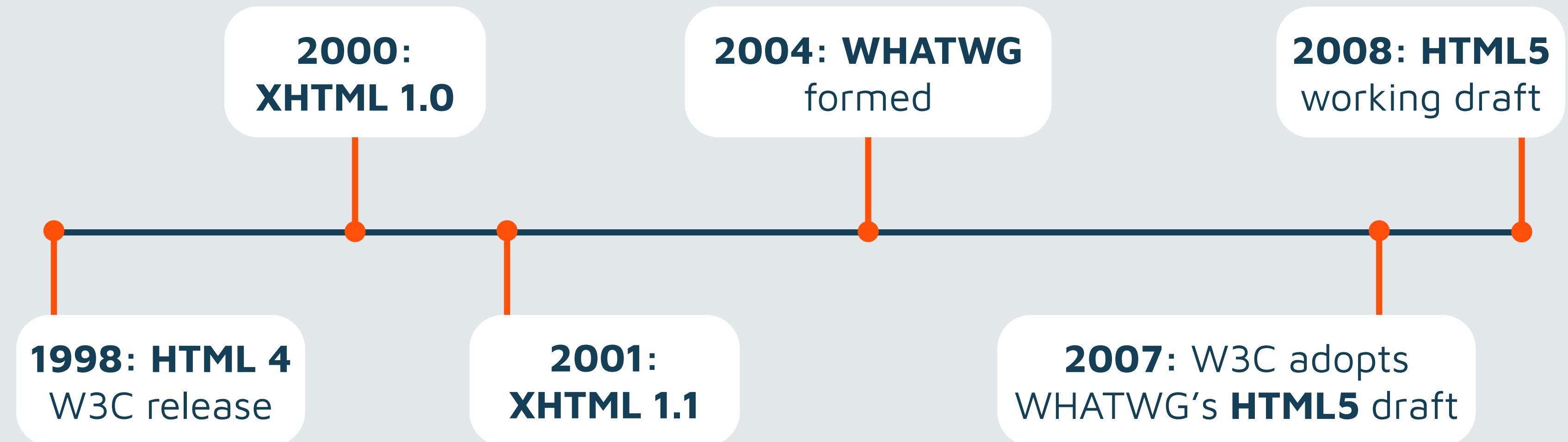
*It is really important to have real developers on the ground involved with the development of HTML. **It is also really important to have browser makers intimately involved and committed...***

***It is necessary to evolve HTML incrementally.** The attempt to get the world to switch to XML, including quotes around attribute values and slashes in empty tags and namespaces all at once didn't work...*

Tim Berners-Lee

Reinventing HTML, 2006

Missing Timeline



Browser vendors shape the future of HTML?

“The W3C HTML working group actively pursues convergence of the HTML specification with the WHATWG living standard.”

HTML5: A NEW HOPE

All code in this class will be written in HTML5!

HTML5

successor to HTML 4.01 and XHTML 1.1

not based on SGML; backwards
compatible

<!DOCTYPE html>



So much simpler!

CONTENT MODEL

defines how elements can be nested

html4 had two categories: inline and block

html5 is more fine-grained

HTML5 CONTENT MODEL

Metadata: **link, script**

Flow: **span, div**

Sectioning: **aside, section**

Heading: **h1**

Phrasing: **span, img**

Embedded: **img, iframe**

Interactive: **a, button**

OTHER HTML5 FEATURES

Fewer Flash sites



support for richer graphics and video

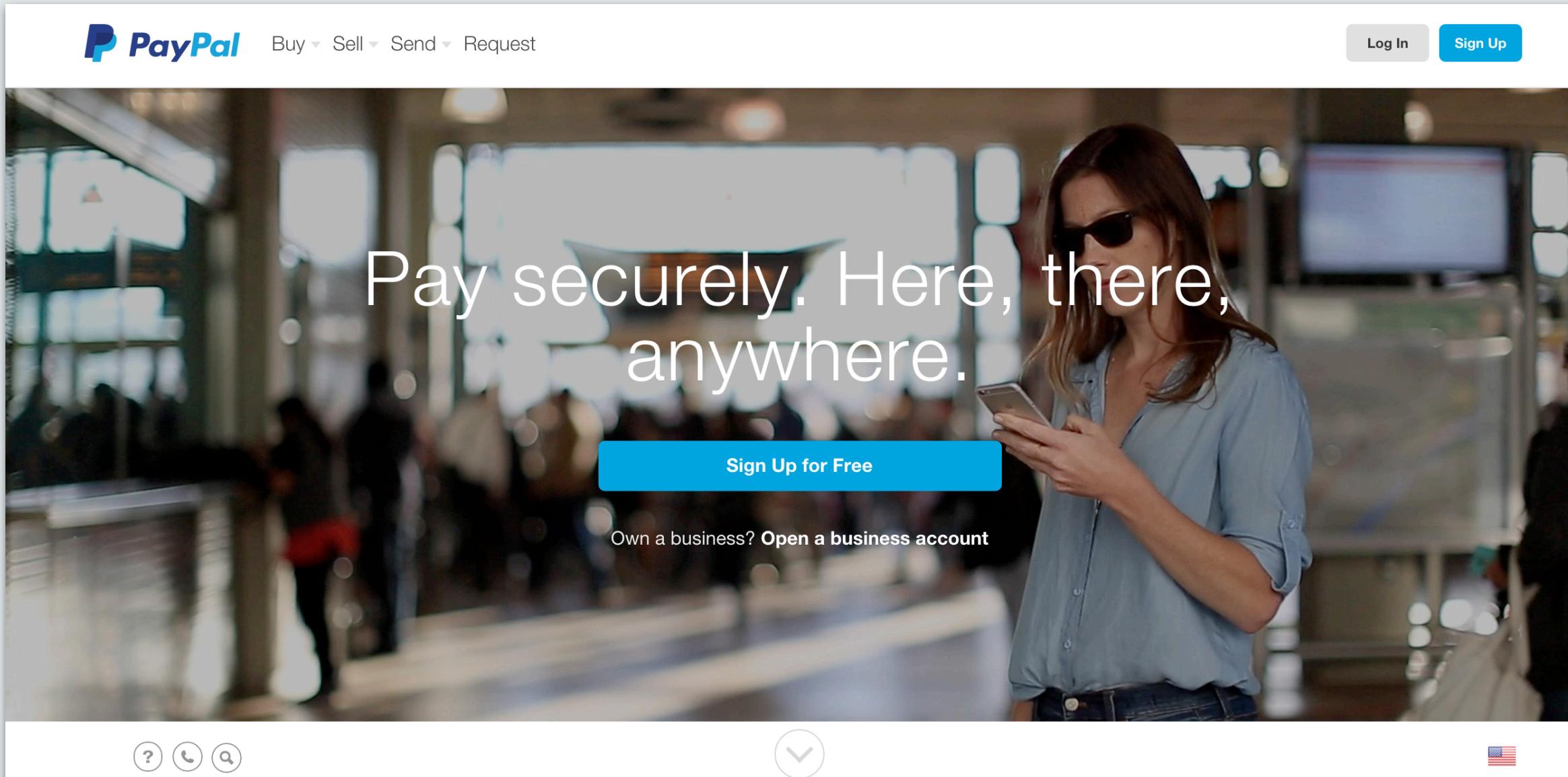
structural semantics



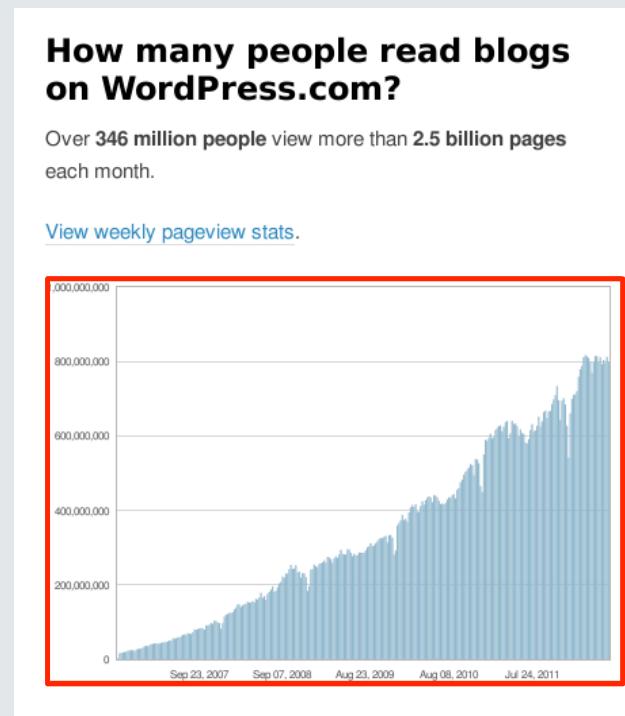
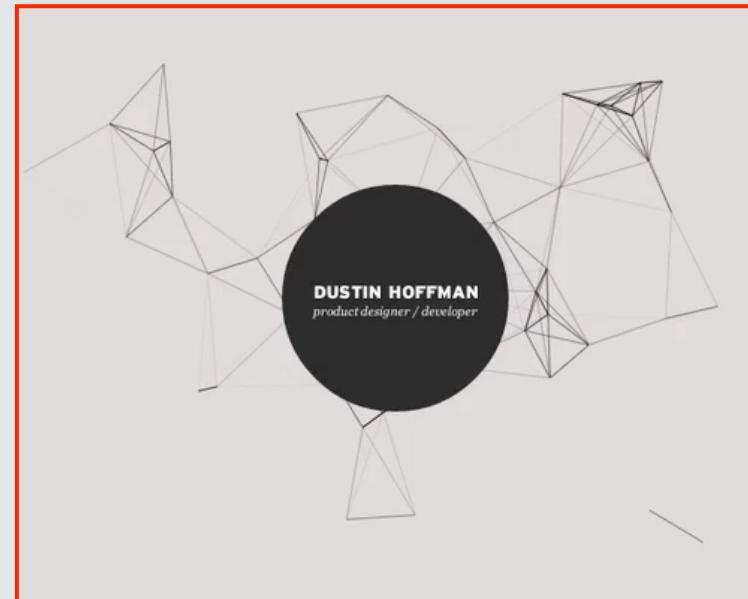
Semantic Web?

<video> and <audio>

pages with sound and large video backgrounds



<canvas>



STRUCTURAL SEMANTIC TAGS

focus on **structure** rather than content

describe the information architecture of pages

step on the road to a semantic “web of data”

STRUCTURAL SEMANTIC TAGS

```
<body>
  <header>
    <h1>How to Get a PhD</h1>
    <nav>...</nav>
  </header>
  <article>
    <section>
      <figure></figure>
      <h3>Bribing your Committee</h3>
      <p>When blackmail fails...</p>
    </section>
    <aside>
      <h4>Useful Links</h4>
      <a href="www.bevmo.com">Research Supplies</a>
    </aside>
  </article>
</body>
```

CodePen

“THERE ARE TWO TYPES OF DEVELOPERS:
those who argue about DIVs not being semantic,
and those who create epic shit.”

Thomas Fuchs
[@thomasfuchs](https://twitter.com/thomasfuchs)

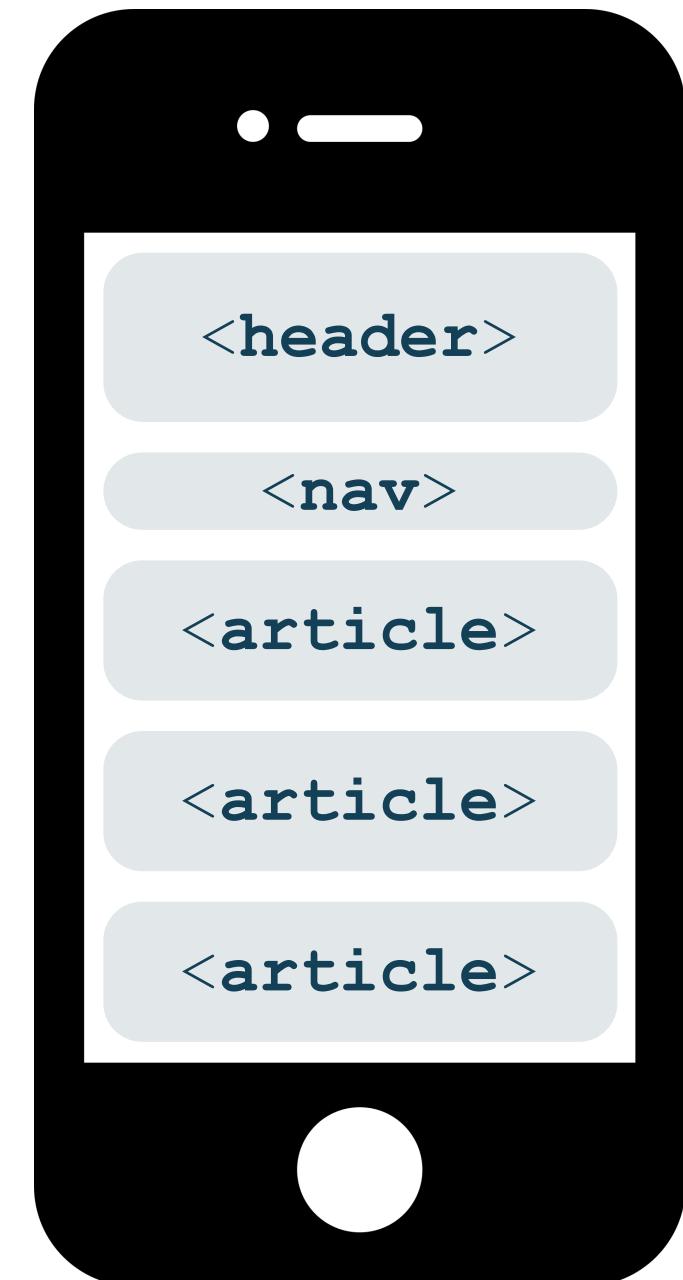
STRUCTURAL SEMANTIC APPLICATIONS?

STRUCTURAL SEMANTIC APPLICATIONS

Reuse stylesheets

Remix pages and applications

Retarget between form factors



class & id ATTRIBUTES

Often contain structural semantic clues

many elements can share the same **class** value; **id** values are unique

Use semantic **class** and **id** values for readability and maintainability

```
<div class="product">  
  <img class="product_image" />  
  <div class="product_description">...</div>  
</div>
```

WRITING GOOD HTML IS HARD!

DESIGN FOR DIFFERENT...

Browsers: Cross-browser Compatibility

Form-Factors: Responsive Design

People: Accessibility, Localization

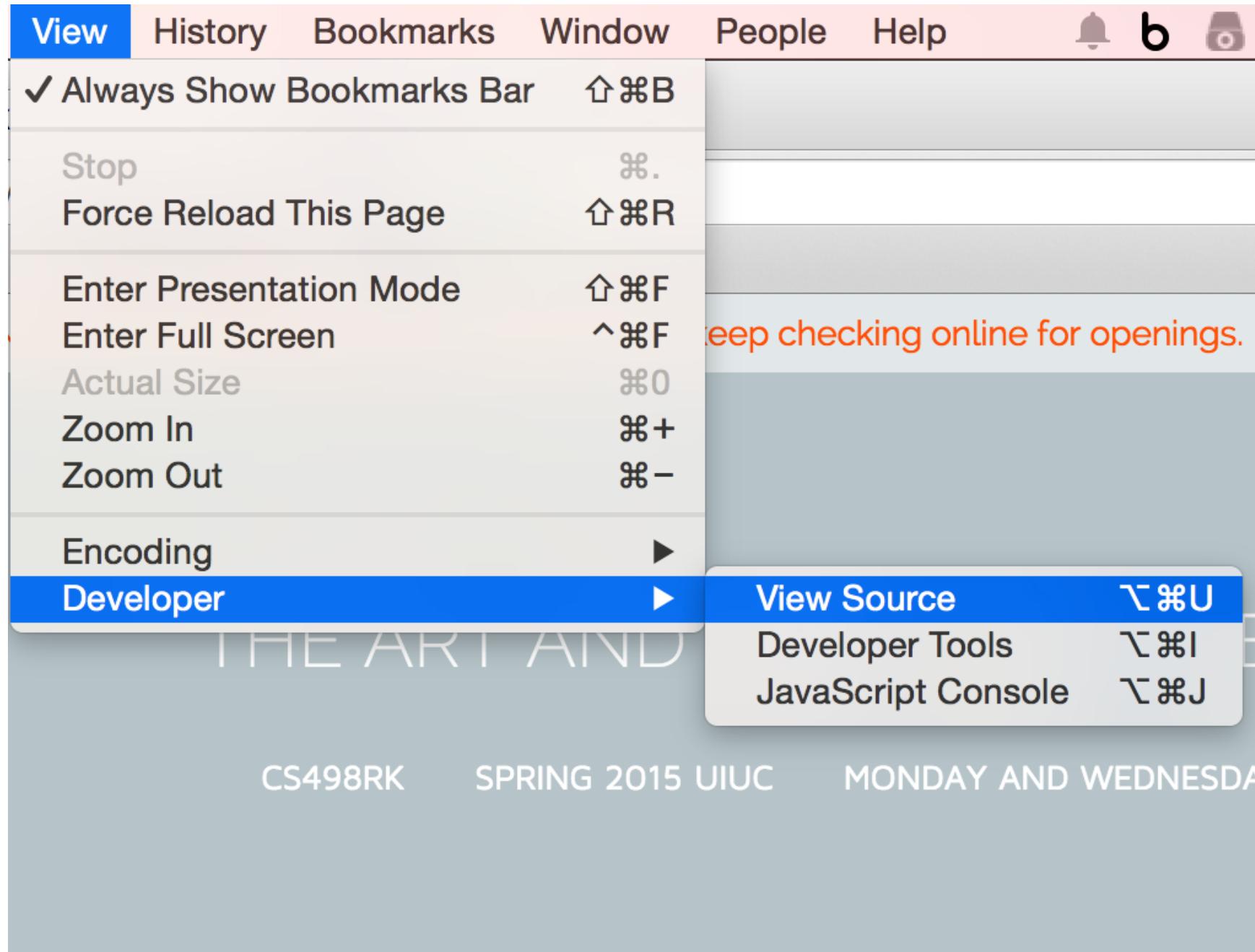
ACCESSIBILITY

Alternative text for images

Use <h*> tags for headings, nested properly

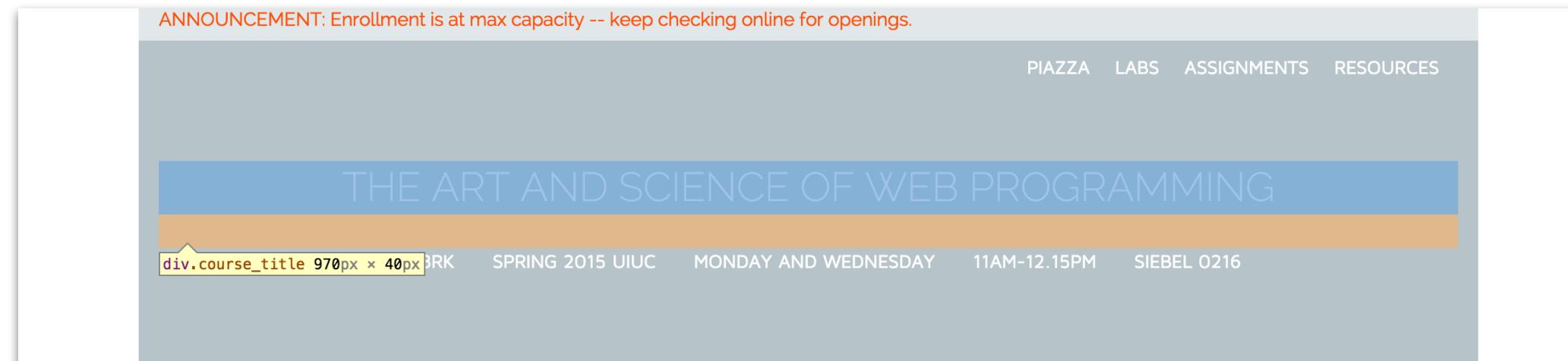
Sufficient contrast between text and background

VIEW SOURCE



inspect a page's implementation

BROWSER INSPECTOR



OVERVIEW

Presents client- and server-side technologies that enable modern Web applications. Topics include the building blocks of the Web (HTML, CSS, the Document Object Model, Javascript) and data exchange (HTTP, JSON, RESTful APIs, and SQL/NoSQL databases). Programming assignments will expose students to CSS

STAFF

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A screenshot of the developer tools showing the DOM tree and the Styles panel. The DOM tree on the left shows the structure of the page, with the 'div.course_title' element selected. The Styles panel on the right shows the CSS rules applied to this element. The 'course_title' rule has a margin-bottom of 25px and is defined in 'app.css:2198'. The 'div' rule has a display of block and is defined in the user agent stylesheet. Other rules shown include 'element.style' and '*,:before,:after' with box-sizing set to border-box.

map code to render-time environment

OTHER RESOURCES

HTML5 Validator: html5.validator.nu

History of HTML: diveintohtml5.info/past.html

NEXT CLASS: CSS

Course Web Page

<https://uiuc-web-programming.gitlab.io/fa21/>

Piazza

<http://piazza.com/illinois/fall2021/cs498rk>