BASIC WEB DEVELOPMENT

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CSS

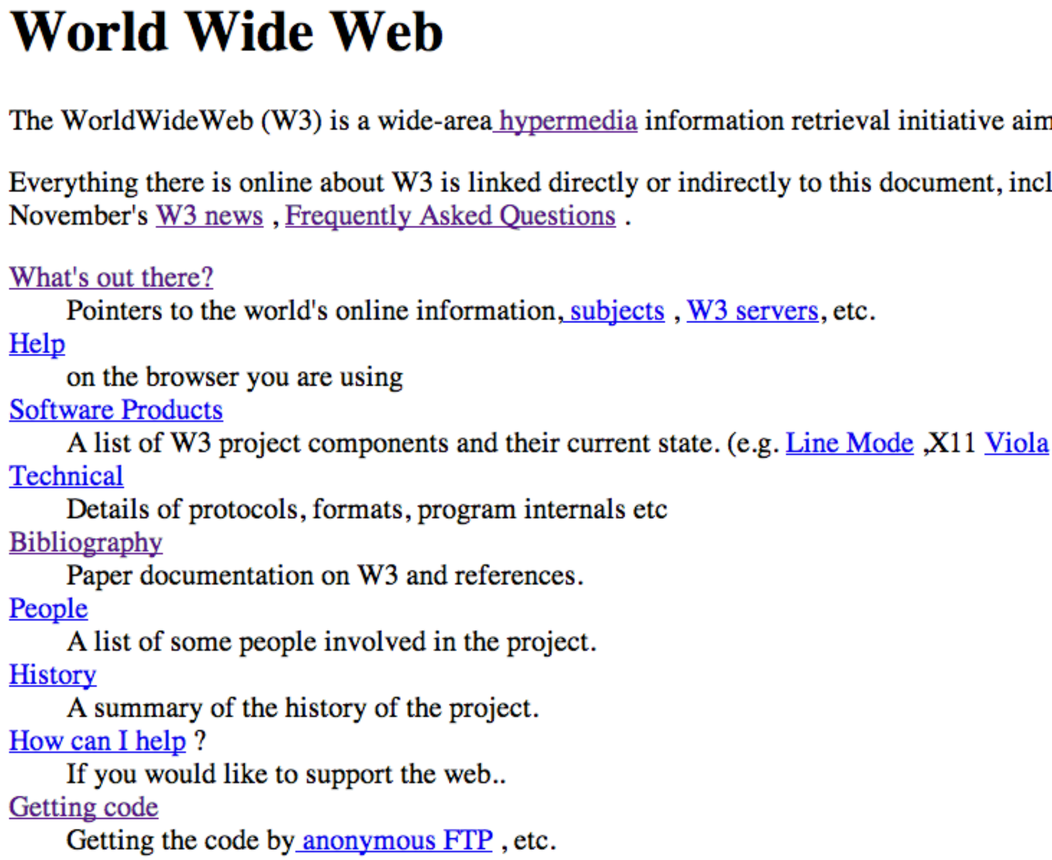
HTML

HTML

Originally: “HyperText Markup Language” (27 years ago)

Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web applications. With Cascading Style Sheets (CSS) and JavaScript it forms a triad of cornerstone technologies for the World Wide Web [Flanagan].

HTML instructs web browsers how to render content to users



World Wide Web

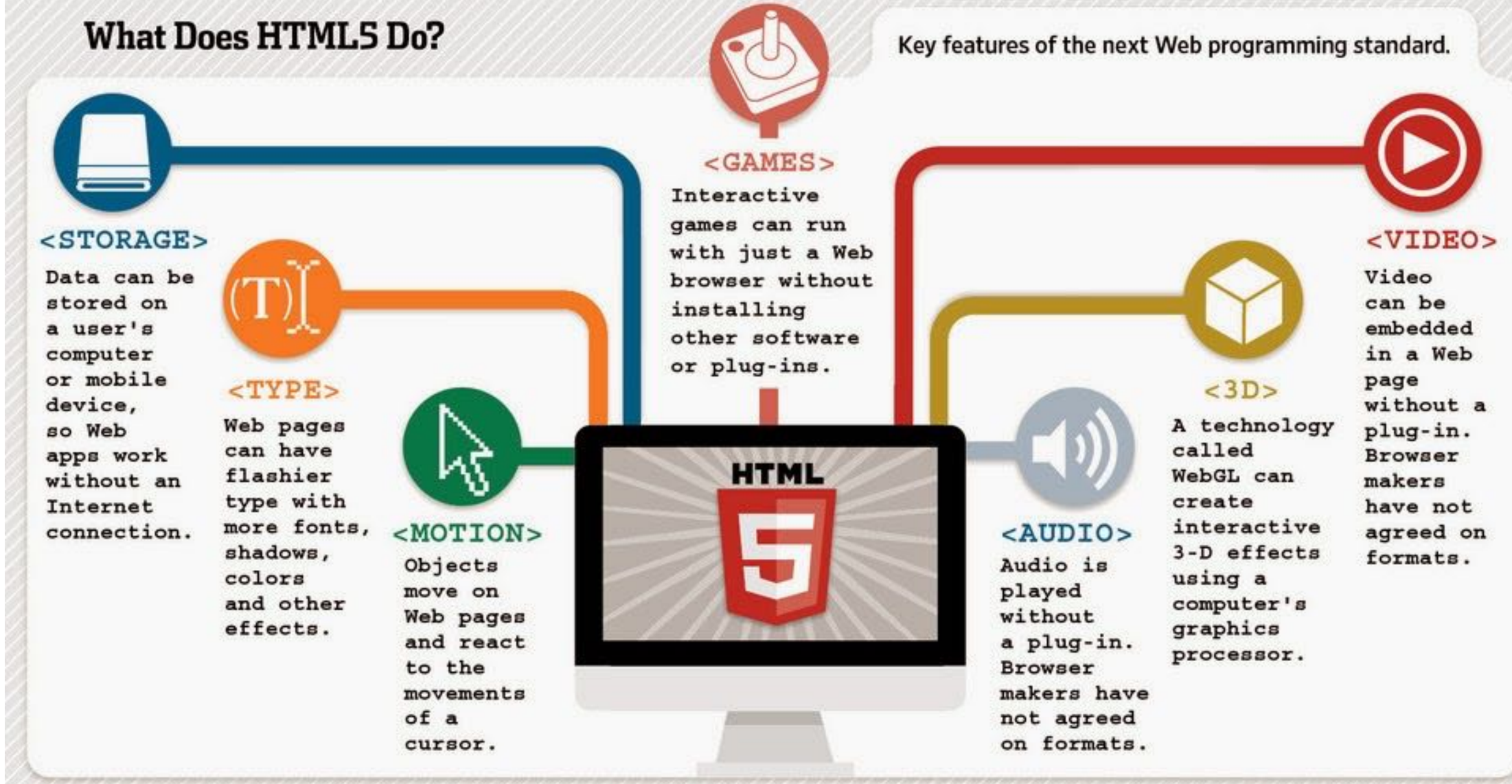
The WorldWideWeb (W3) is a wide-area hypermedia information retrieval initiative aim

Everything there is online about W3 is linked directly or indirectly to this document, incl
November's W3 news , Frequently Asked Questions .

What's out there?
Pointers to the world's online information, subjects , W3 servers, etc.
Help
on the browser you are using
Software Products
A list of W3 project components and their current state. (e.g. Line Mode ,X11 Viola
Technical
Details of protocols, formats, program internals etc
Bibliography
Paper documentation on W3 and references.
People
A list of some people involved in the project.
History
A summary of the history of the project.
How can I help ?
If you would like to support the web..
Getting code
Getting the code by anonymous FTP , etc.

What Does HTML5 Do?

Key features of the next Web programming standard.

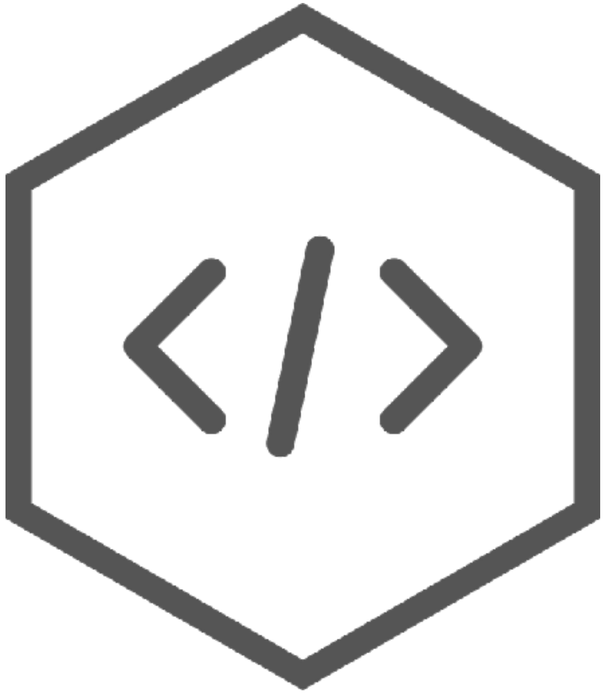


```
  <div id="h-js-header__drawer-backdrop" class="h-c-header__drawer-backdrop"></div>
</div>    <div class="main">
<div class="hero hero--home" >

  <div class="hero__image hero__image--mobile "
      style="background-image: url('/assets/static/images/home/hero-home-mobile.jpg')">
    </div>
  <div class="hero__image hero__image--desktop "
      style="background-image: url('/assets/static/images/home/hero-home.jpg')">
    </div>
  <div class="hero__content">
    <div class="h-c-page">
      <div class="h-c-grid">
        <div class="h-c-grid__col h-c-grid__col-l--10 h-c-grid__col-l--offset-1">
          <div class="hero__logo"></div>
          <h1 class="hero__title h-c-headline h-c-headline--two">
            Bringing the benefits of AI to everyone
          </h1>
        </div>
      </div>
    </div>
  </div>
</div><section class="copy padding-bottom--none copy--home h-c-page">
  <div class="h-c-grid">
    <div class="copy__column h-c-grid__col h-c-grid__col--10 h-c-grid__col--offset-1
h-c-grid__col-l--7 h-c-grid__col-l--offset-2">


        <div class="copy__text "><p class="h-c-copy">
  Our mission is to organize the world's information and make it universally accessible and useful, and AI is enabling us to do that in incredible new ways -
solving problems for our users, our customers, and the world.
</p>

<p class="h-c-copy">
  AI makes it easier for you to do things every day, whether it's searching for photos of people you love, breaking down language barriers, or helping you get
things done with your own personal digital assistant. But it's also providing us with new ways of looking at old problems and helping transform how we work and
live, and we think the biggest impact will come when everyone can access it.
</p></div>
```



HTML documents are composed of elements represented by tags, to categorize content.

Part of source page from google.ai

Basic elements

```
<!DOCTYPE html>
<html>
   <head>
      <title>Hello World</title>
   </head>
  <body>
      <h1>My Header 1</h1>
      <h2>My Header 2</h2>
      <h3>My Header 3</h3>
      <p>Say hello to my little text.</p>
   </body>
</html>
```

My Header 1

My Header 2

My Header 3

Say hello to my little text

HTML element

```
<h3>My Header 3</h3>
```

HTML tag

```
<h3>
```

HTML attributes

Opening tags can contain extra information about the element

```
<a id=‘myanchor’ href=‘http://www.google.com'>A link to Google</a>
```

The most important attributes are:

- id: the element can be referenced directly from JS (like a global variable)
- class (next slides)
- style (next slides)

Document metadata

<html> creates the entire HTML container.

<head> creates the header with the page's title and links to style sheets/scripts.

<script> links to or embeds a script.

<style> for embedding a style in the website.

<link> to reference an external document, often a css document like that: **<link rel="stylesheet" type="text/css" href="style.css">**. The rel attribute defines the relationship to the active document, the type attribute tells the browser which type of file to expect.

<body> marks the container of the content of the website.

Necessary boilerplate

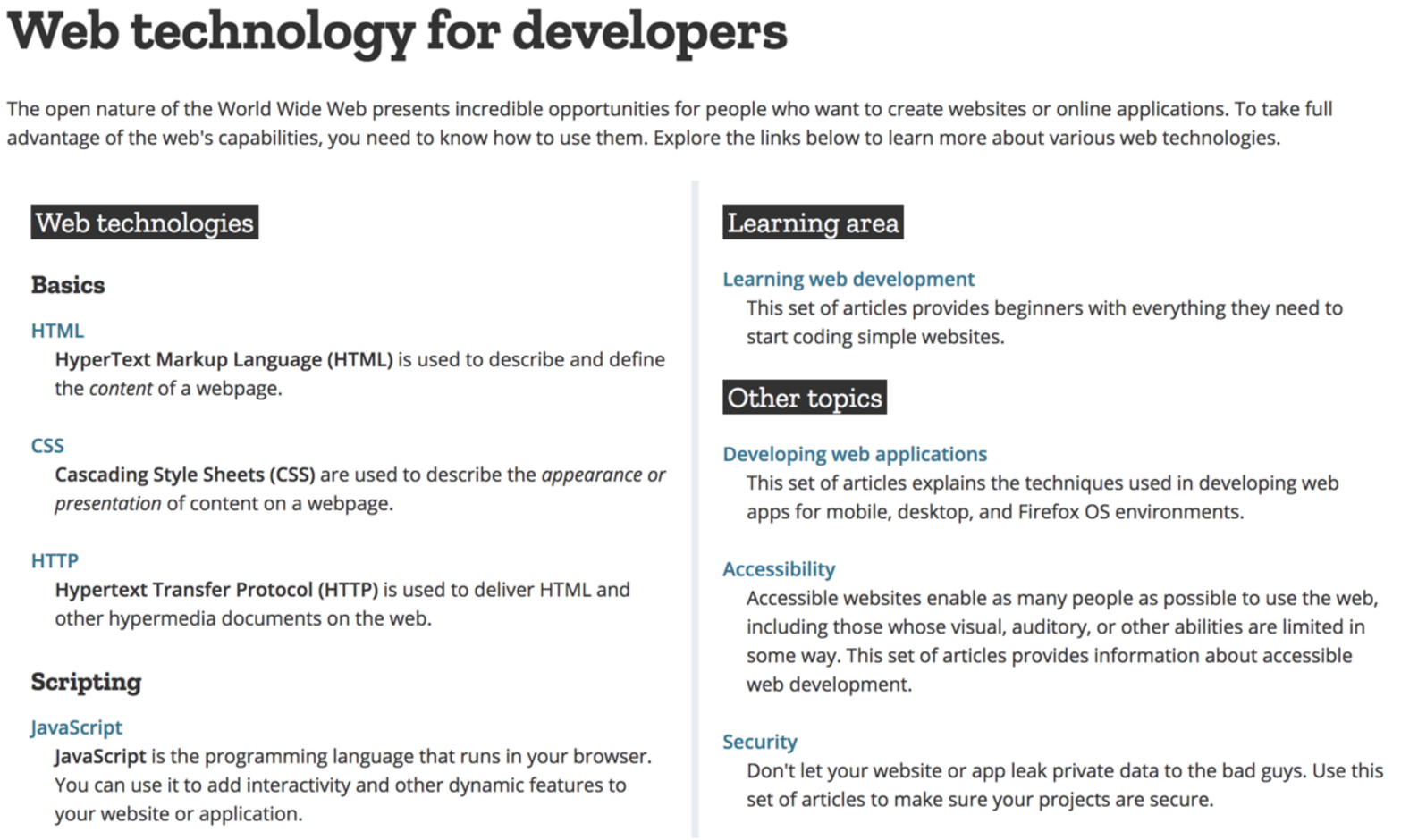
```
<!DOCTYPE html>
<html lang="en">
   <head>
      <meta charset="UTF-8">
       <title>A Title</title>
   </head>
   <body>
      Insert stuff here
   </body>
</html>
```

Live example

https://codepen.io/kikohs/pen/qXZgag

Vital resources

Mozilla developer network



Web technology for developers

The open nature of the World Wide Web presents incredible opportunities for people who want to create websites or online applications. To take full advantage of the web's capabilities, you need to know how to use them. Explore the links below to learn more about various web technologies.

Web technologies

Basics

HTML
HyperText Markup Language (HTML) is used to describe and define the *content* of a webpage.

CSS
Cascading Style Sheets (CSS) are used to describe the *appearance or presentation* of content on a webpage.

HTTP
Hypertext Transfer Protocol (HTTP) is used to deliver HTML and other hypermedia documents on the web.

Scripting

JavaScript
JavaScript is the programming language that runs in your browser. You can use it to add interactivity and other dynamic features to your website or application.

Learning area

Learning web development
This set of articles provides beginners with everything they need to start coding simple websites.

Other topics

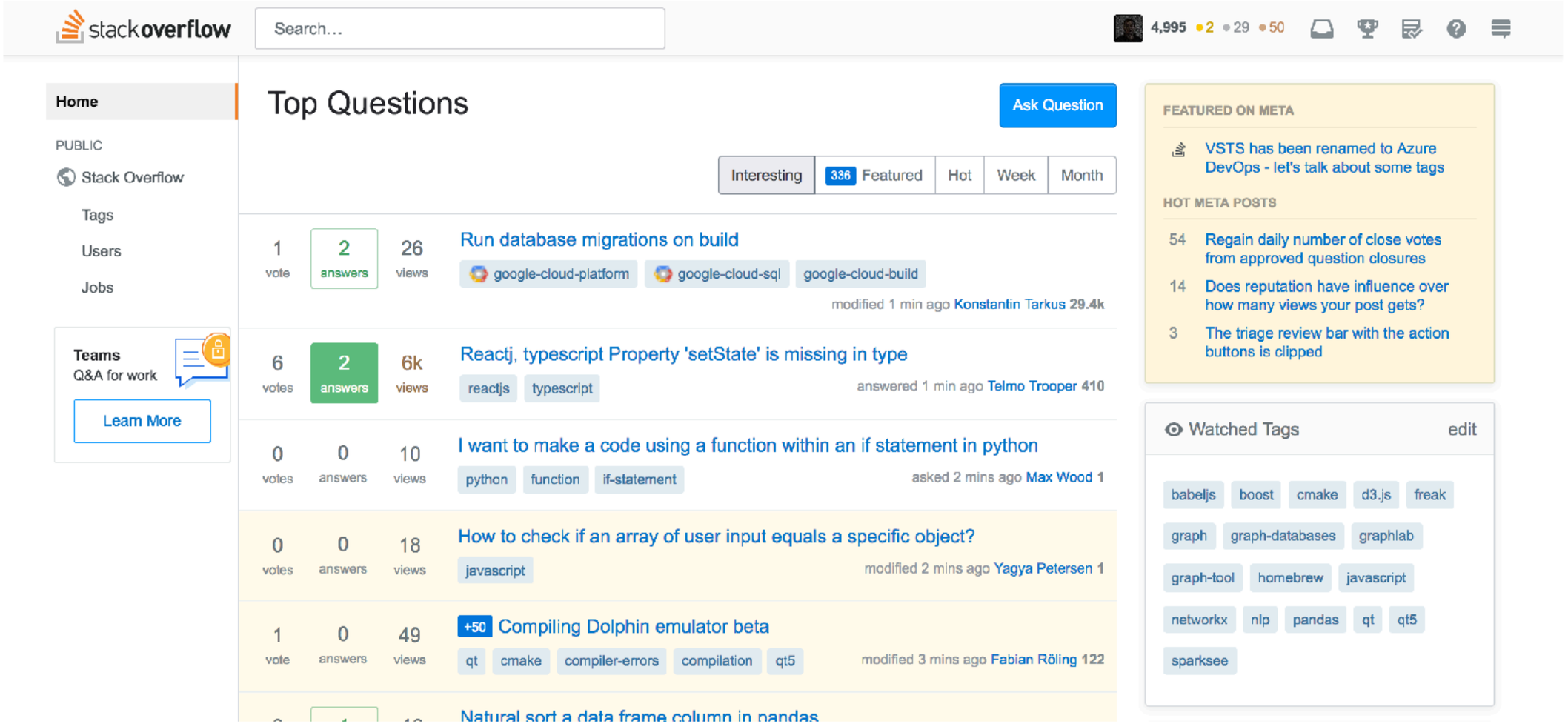
Developing web applications
This set of articles explains the techniques used in developing web apps for mobile, desktop, and Firefox OS environments.

Accessibility
Accessible websites enable as many people as possible to use the web, including those whose visual, auditory, or other abilities are limited in some way. This set of articles provides information about accessible web development.

Security
Don't let your website or app leak private data to the bad guys. Use this set of articles to make sure your projects are secure.

https://developer.mozilla.org/en-US/docs/Web

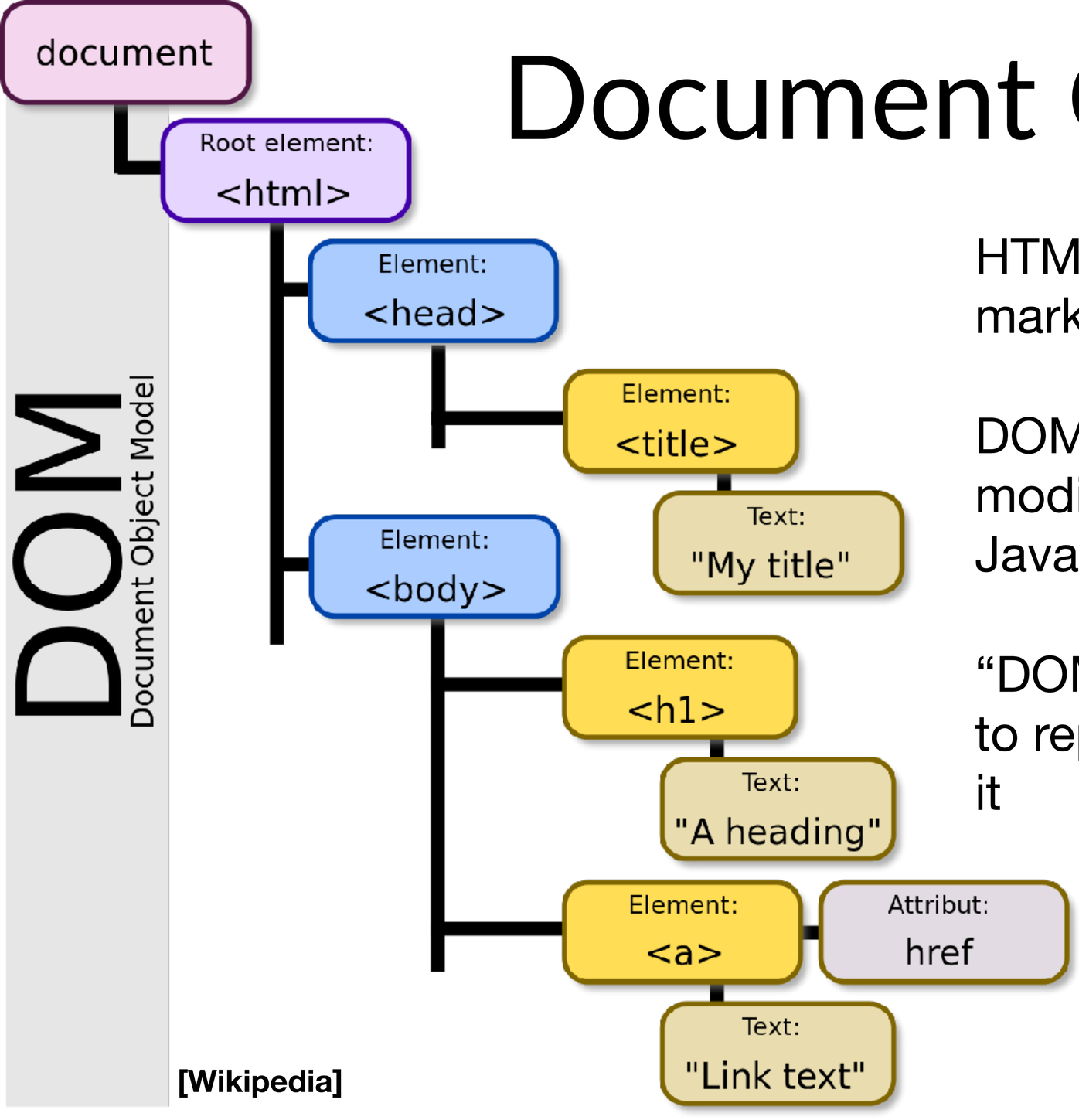
Vital resources



https://stackoverflow.com/

Stack Overflow

Document Object Model

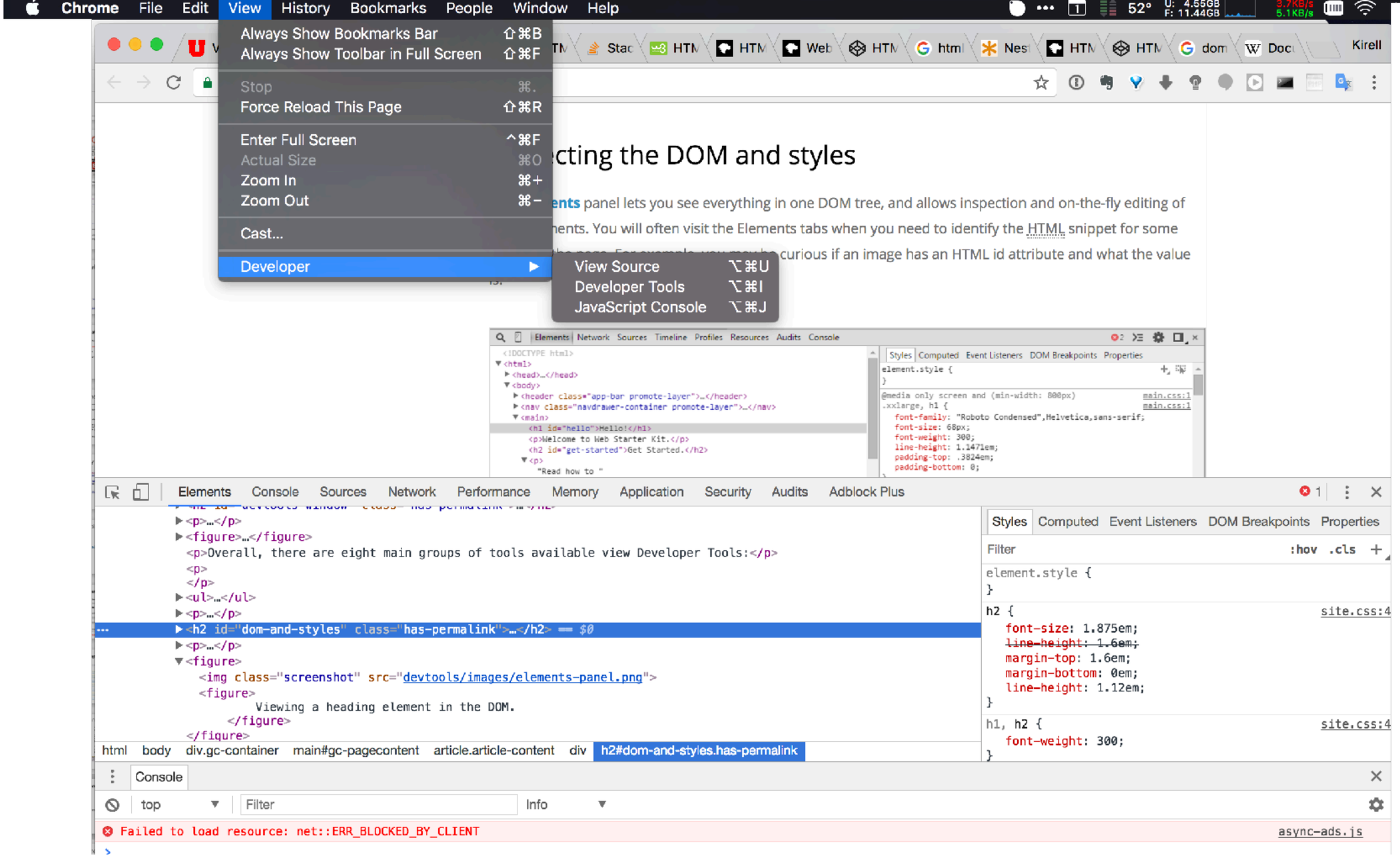


[Wikipedia]

HTML is a textual representation of a markup document.

DOM is a programming interface for modifying a HTML document from Javascript.

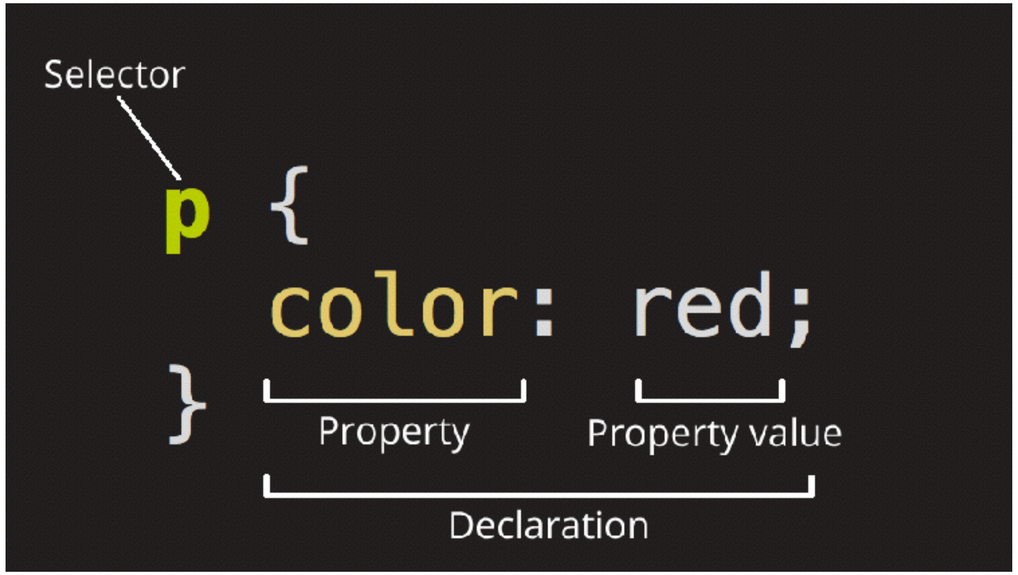
“DOM” ≈ tree created by the web browsers to represent the document + API to access it



https://developer.chrome.com/devtools

Cascading Style Sheets and Selectors

CSS control the way elements are rendered by a web browser



https://developer.mozilla.org/en-US/docs/Web/CSS/Syntax

```
<!DOCTYPE html>
<html lang="en">
   <head>
      <style>
        p {
          color: red;
        }
      </style>
   </head>
   <body>
      <p>My paragraph!</p>
   </body>
</html>
```

My paragraph!

Inline CSS

```
<p style="color: red">My paragraph!</p>
```

Very specific, not reusable

Don't use it!

Embedded CSS

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <style>
            p {
                color: red;
            }
        </style>
    </head>
    <body>
        <p>My paragraph!</p>
    </body>
</html>
```

Style is put in the <head><style> tag

Good enough for a single page but cannot be shared across all pages

Linked CSS

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <link rel="stylesheet" type="text/css" href="style.css">
    </head>
    <body>
        <p>My paragraph!</p>
    </body>
</html>
```

Styles are in their own dedicated file with '.css' extension.

A <link> tag in the <head> links to the location of the file

Style is coherent across website, easy to change the layout of the whole site

More on CSS selectors

id are used once a page and are specific to a single element

class are reusable across elements

CSS

```
p {
  font-family: verdana;
}

#par1 {
  color: blue;
}

.important {
 font-weight: bold;
}
```

```
<p id="par1" class="important">My paragraph!</p>
```

My paragraph

HTML

Live example

https://codepen.io/kikohs/pen/vJGPjJ

Scalable Vector Graphics (SVG)

Scalable Vector Graphics (SVG) is an markup language for describing two-dimensional vector graphics.

SVG is essentially to graphics what HTML is to text.

Simple example

```
<svg width="300" height="200">
  <rect width="100%" height="100%" fill="red" />
  <circle cx="150" cy="100" r="80" fill="green" />
  <text x="150" y="125" font-size="60" text-anchor="middle"
fill="white">SVG</text>
</svg>
```

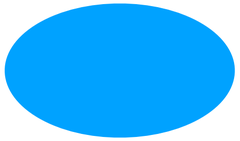
https://developer.mozilla.org/en-US/docs/Web/SVG/Tutorial/Getting_Started

Basic shapes

Rectangle

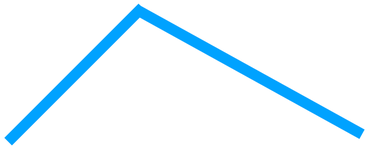
Circle

Ellipse



Line

Polyline (group of connected straight lines)



Polygon (closed shape)

Path?

https://developer.mozilla.org/en-US/docs/Web/SVG/Tutorial/Basic_Shapes

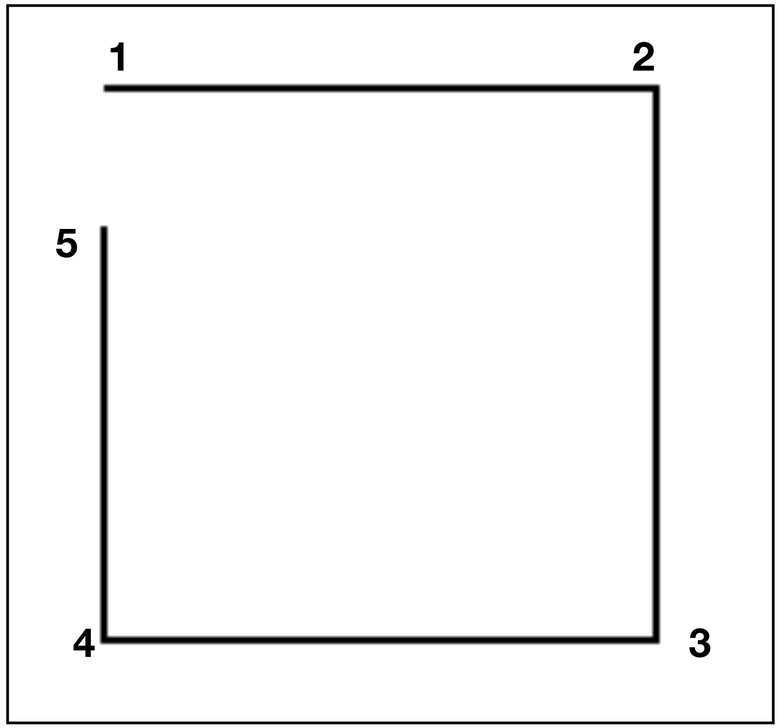
SVG Path

Most powerful element in SVG

Can draw any shape by a mixture of letters and coordinates

Basic commands such as MoveTo, LineTo, Horizontal lineto, Vertical lineto, etc.

Capital letter: absolute pos; lower case is relative to the last point




```
<path d="M10 10 H 90 V 90 h -80 l 0 -60" />
```

Live example

https://codepen.io/kikohs/pen/RZazGp

Group and transform

<g> allows to group several svg elements (similar to div in HTML)

```
<g fill="red">
  <rect x="0" y="0" width="10" height="10" />
  <rect x="20" y="0" width="10" height="10" />
</g>
```

The transform attribute allows to apply any transformations to your shapes

```
<rect x="0" y="0" width="10" height="10" transform="translate(30,40)" />
```

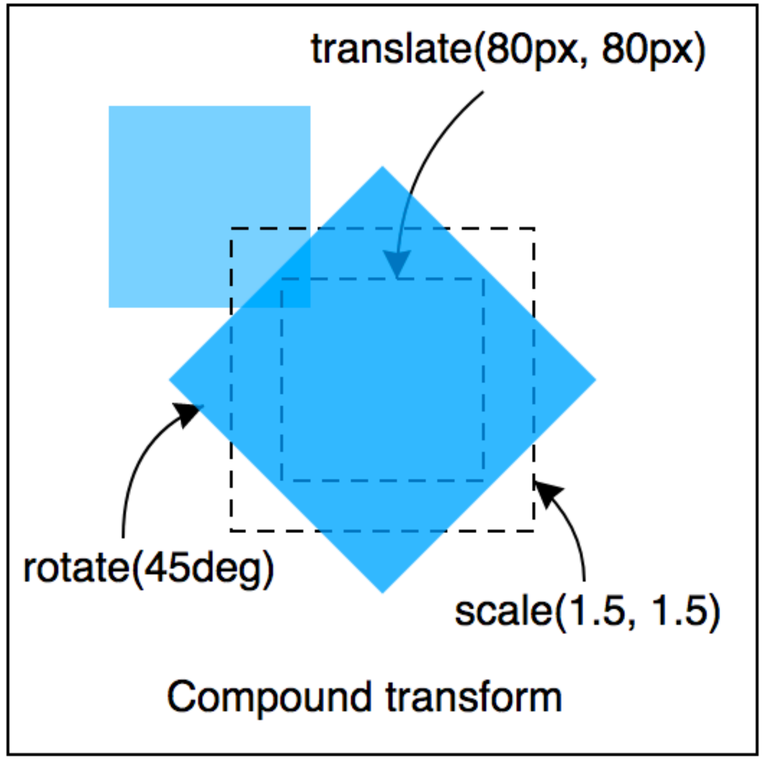
List of transformations

Translation

Rotation

Skewing (alter in particular direction)

Scaling



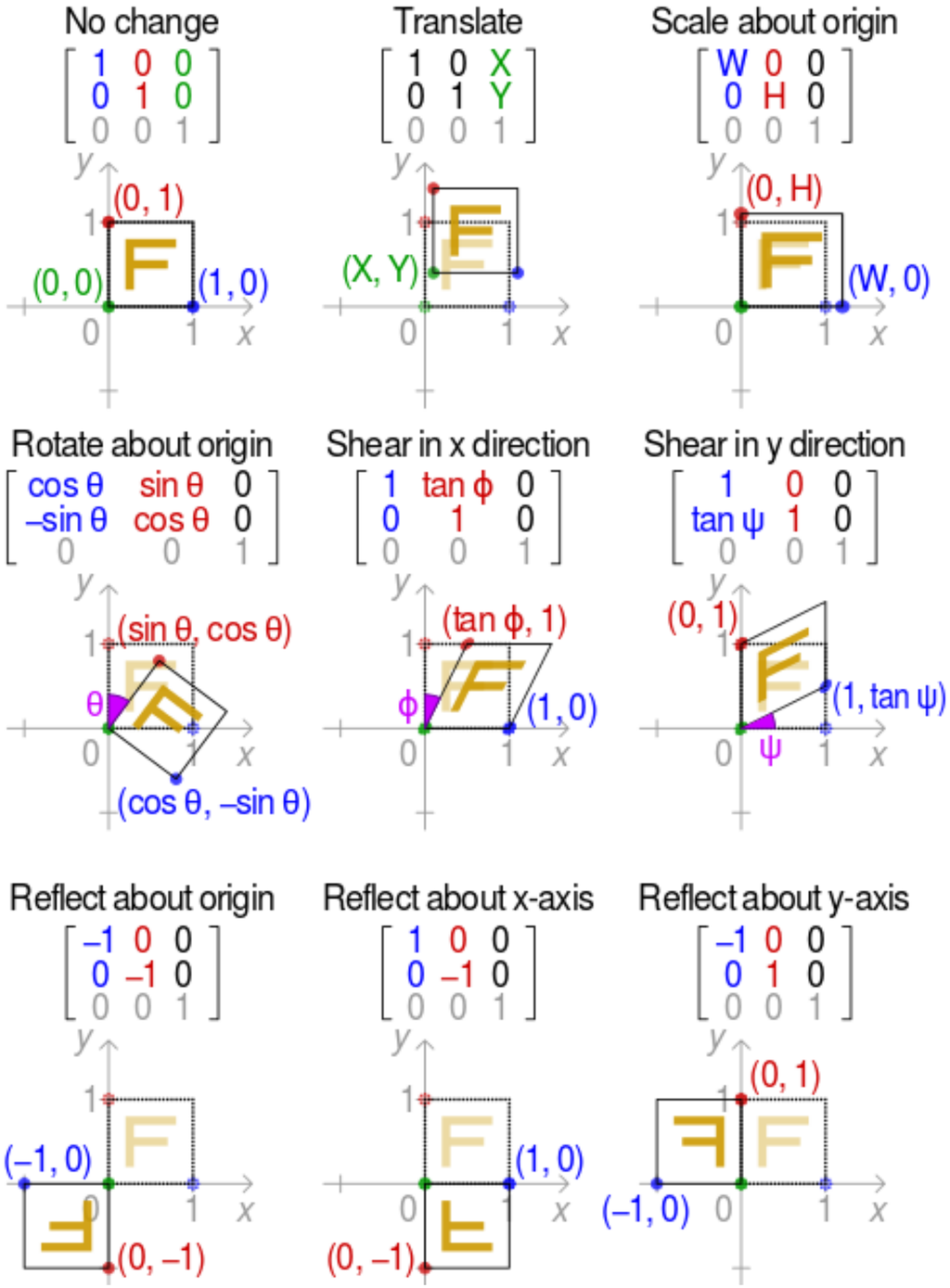
www.w3.org

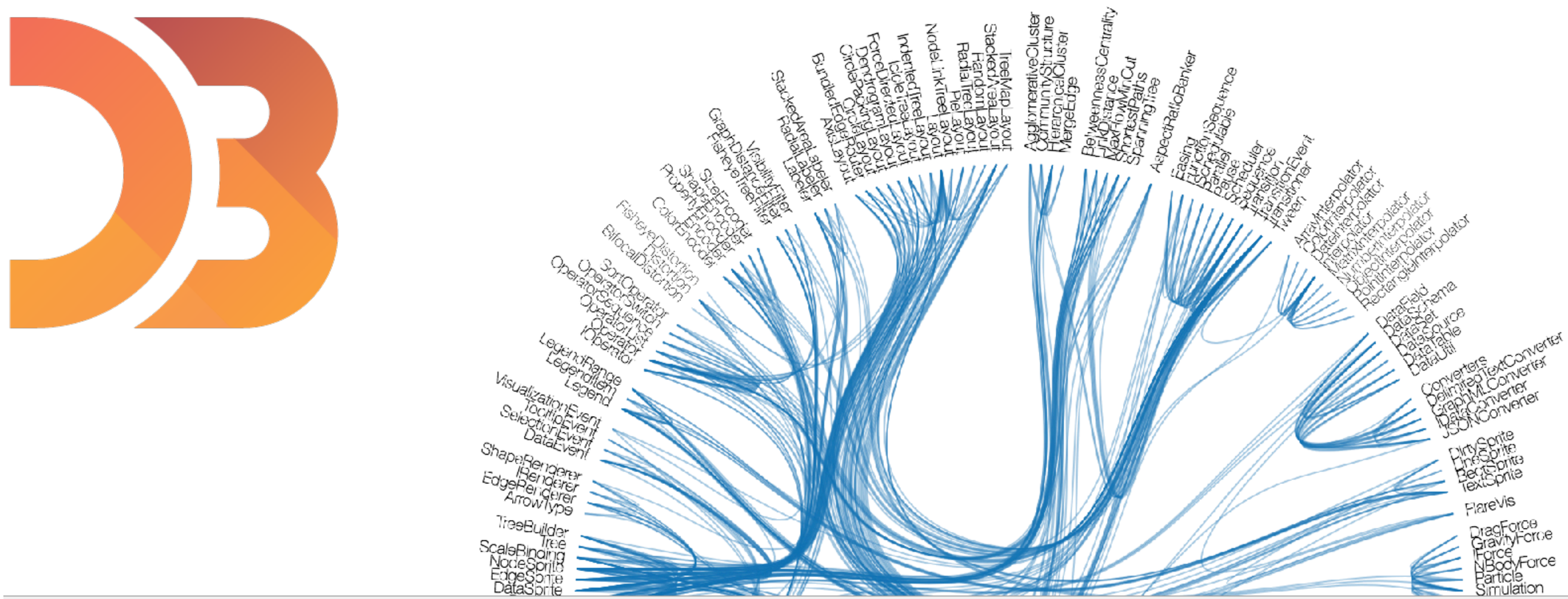
https://developer.mozilla.org/en-US/docs/Web/SVG/Tutorial/Basic_Transformations

Add a third dimension point (x,y) to acount for translation

$$\begin{bmatrix} x' \\ y' \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & t_x \\ 0 & 1 & t_y \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}.$$

Complex transformations with matrix()





Elements Console Sources Network Performance Memory Application Security Audits Adblock Plus

```
<body data-gr-c-s-loaded="true">
  <div style="top: -80px; left: -160px; width: 1280px; height: 1280px; position: absolute; backface-visibility: hidden;">
    <svg width="1280" height="1280">
      <g transform="translate(640,400)rotate(0)">
        <path class="arc" d="M0,280A280,280 0 1,1 0,-280A280,280 0 1,1 0,280Z"></path> == $0
        <path class="link source-AgglomerativeCluster target-DataList" d=
        "M7.036426724134508,-279.911572999324C7.036426724134508,-279.911572999324,7.036426724134508,-279.911572999324,6
        .8362590950239905,-270.7765104989103C6.636091465913471,-261.64144799849663,6.235756207692434,-243.3713229976692
        4,7.306818383070269,-224.79234437484126C8.377880558448103,-206.21336575201326,10.920340167424811,-187.325533507
        18467,13.868673909328674,-150.32339240557982C16.817007651232537,-113.321251303975,20.171215526063556,-58.204801
        34559394,-2.477319005075916,-34.007537747567156C-
        25.125853536215388,-9.810274149540371,-73.77713047332534,-16.53219691186787,-107.19439401022655,-19.51339090478
        1286C-
        140.61165754712778,-22.494584897694704,-158.7949076838202,-21.735050121194035,-185.05315517825906,-18.445778703
        38464C-
        211.31140267269794,-15.156507285575238,-245.64464752488323,-9.337499226457108,-262.8112699509759,-6.42799519689
        8042C-
        279.9778923770685,-3.518491167338977,-279.9778923770685,-3.518491167338977,-279.9778923770685,-3.51849116733897
        65"></path>
```

Styles Computed Event Listeners DOM Breakpoints Properties

Filter :hov .cls +

```
element.style {
}

path.arc {                                          bundle.html:
    cursor: move;
    fill: #fff;
}

path[Attributes Style] {
    d: path('M 0 280 A 280 280 0 1 1 0 -280 A 280 280 0 1
       1 0 280 Z');
}

* {                                          user agent styleshee
    transform-origin: 0px 0px 0px;
}
```

Wrapping-up

HTML structures the content of a webpage and instruct the browser on how to display it

CSS styles the elements

SVG is a markup language to describe graphics

JS and d3.js will help us deal with complex SVG to create stunning charts

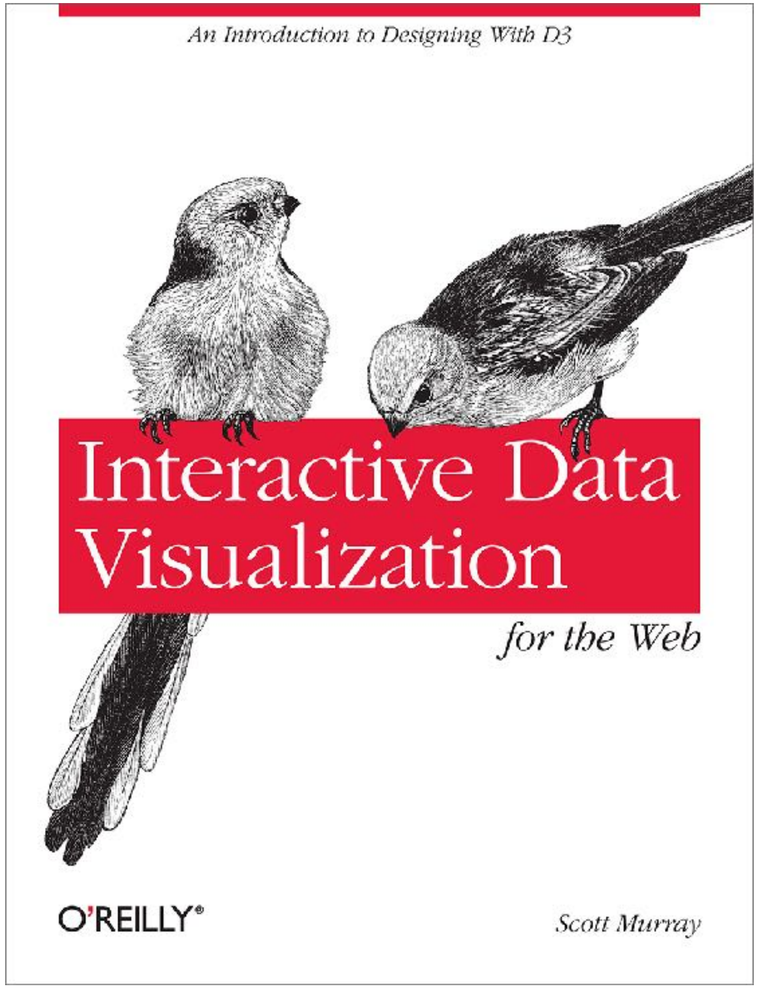
Homework

Finish MDN tutorials on HTML, CSS and SVG

https://developer.mozilla.org/en-US/docs/Learn/HTML/Introduction_to_HTML/Getting_started

https://developer.mozilla.org/en-US/docs/Learn/CSS/Introduction_to_CSS/How_CSS_works

https://developer.mozilla.org/en-US/docs/Web/SVG/Tutorial

Read 3 first chapters

http://chimera.labs.oreilly.com/books/1230000000345