Intro to the Web

Lecture 1

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Course Overview

Intro to the Web

Language Overview

Introduction to the DOM

DOM API and Events

Asynchronous JavaScript

Extended JavaScript

Why learn JavaScript?

It’s kinda a big deal

Ubiquitous in modern web development, runs server side and in the browser

Poorly understood

Very rarely taught well, and has evolved from a messy origin

Flexible

A simple, weakly typed, scripting language that is easy to pick up and develop with

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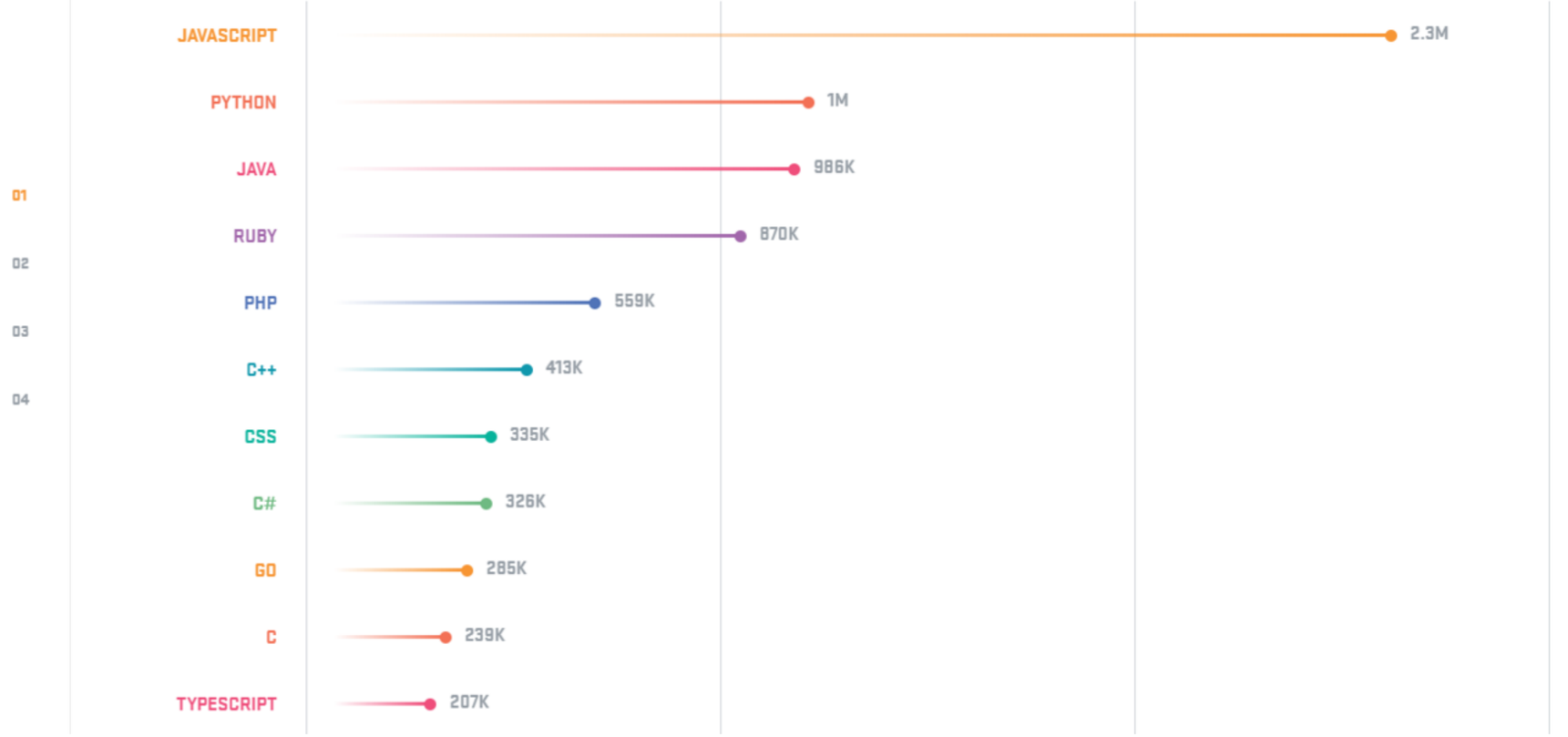
The fifteen most popular languages on GitHub

by opened pull request

GitHub is home to open source projects written in 337 unique programming languages—but especially JavaScript.



GitHub

FOCUS

JavaScript in the Browser

Language Fundamentals

Frontend Fundamentals

WE WON'T

Cover NodeJS in depth

Cover HTML & CSS in depth

Teach you JS frameworks

Subjects not covered are not less important - we just don’t have time to do them justice!

Getting Setup

The right tools for the job

RECOMMENDED RESOURCES

MDN

Mozilla's Developer Network has comprehensive documentation for web development.

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

You Don't Know JS

Free ebook available which has particularly good explanations on the JS language.

https://github.com/getify/You-Dont-Know-JS

Course Material

We've put together a selection of examples and additional reading which we hope helps.

The web...

There are countless resources on the web for web development these days. Very few bad choices.

Development Browser Choice

Google Chrome

Modern, bleeding edge support of JS and CSS plus great dev tools

Mozilla Firefox

Not built by Google, and committed to the open web. Still a great browser.

Safari

Same JS engine as Chrome, with a slightly different DevTools experience

Use an IDE

VSCode

Built for web development and has some nifty type inference built in

WebStorm

Will likely require a license but a trial period should be available.

Node.js

Installing Node.js on your system will be helpful even if you're developing for the web.

You can download and install the node binary from the link below.

https://nodejs.org/en/

The modern web

Some background to how we got here

The modern web

HTML

The scaffold for any modern web page. A form of markup language used to format web documents.

CSS

Cascading Style Sheets. After a few false starts the de facto standard for applying styles and basic animations

JavaScript

Envisioned initially to help supercharge CSS, but has since evolved to facilitate ‘dynamic web pages’

HTML

- Lightweight, scaffold for web pages
- Collection of tags and attribute-value pairs
- Limited but core functionality

HTML Crash Course

HTML

Structure

Tags

Attributes

HTML Elements

The most basic selector, apply to the corresponding HTML element. eg:

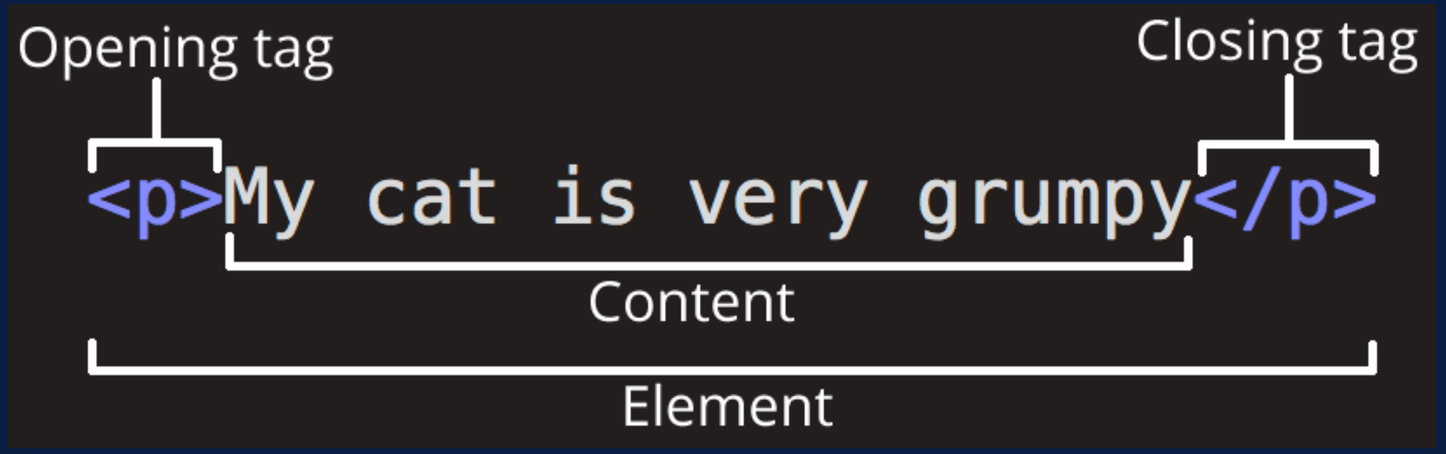


Image Source: MDN

HTML

Structure

Tags

Attributes

Tags

Tags define the type of element we are rendering, and help to semantically structure the document.

```
<html></html>, <body></body>, <main></main>
<!-- This is a comment -->

<!-- These tags are for structuring text -->
<p></p>, <h1></h1>, <h2></h2>

<!-- These tags are for lists -->
<ul>unorderd</ul> or <ol>ordered</ol>
<li>list items</li>

<!-- Thest tags are for content structure -->
<nav></nav>, <article></article>, <section></section>, <form></form>

<!-- These tags are special tags -->
<img/>, <input/>, <button></button>
<!--
     Some people just prefer to use divs everywhere.
     Those people are bad people
 -->
<div></div>
```

HTML

Structure

Tags

Attributes

Attributes

Attributes control how an element behaves. There are many ‘standard’ attributes that apply to all elements. Eg. class, style, id.

```
<!-- Will render a text input -->
<input type="text" name="firstName"
placeholder="Jeff">
<!-- Will render a password field -->
<input type="password" name="password">

<!-- When this form is submitted it'll do a get
request on /some/path -->
<form action="/some/path" method="get"></form>

<!-- This image has a src attribute of fake.jpg -->
<img src="fake.jpg">
```

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CSS

- Arose to extend HTML functionality
- ‘Style elements’ were a poor, cumbersome way to style - CSS abstracted out style from markup using selectors

CSS Crash Course

CSS Structure

Property/Value Pairs

CSS uses a selector combined with a key-value property pair to style elements. There are hundreds of possible styles, but common one's include: margin, padding, color, font... to name a few.

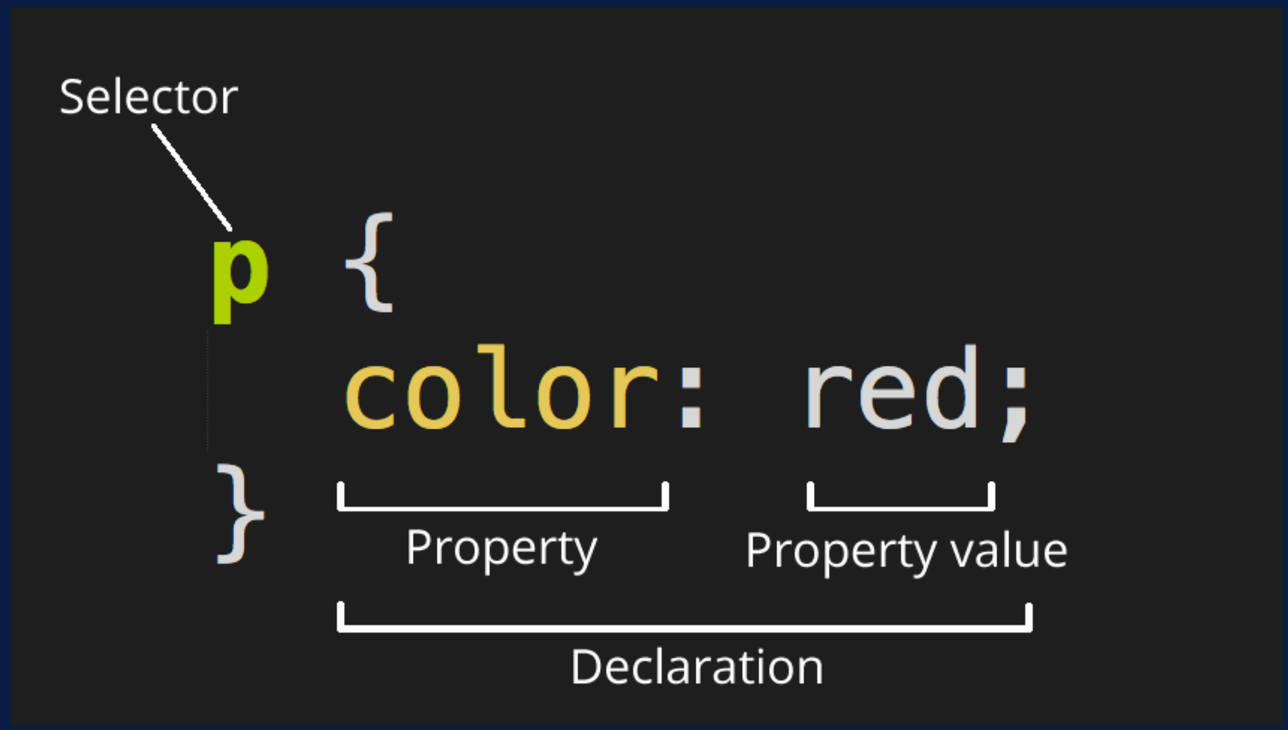


Image Source: MDN

CSS Selectors

Tags

Classes

Pseudo

ID

Tag Selectors

The most basic selector, apply to the corresponding HTML element. eg:

```
p {
    color: black;
    font-weight: normal;
}

h1 {
    color: red;
    font-weight: bold;
}
```

CSS Selectors

Tags

Classes

Pseudo

ID

Class Selectors

A more extensible approach to styling, denoted by the leading '.' in the selector. eg:

```
.box {
    width: 100px;
    height: 100px;
}

.red {
    background-color: red;
}

.blue {
    background-color: blue;
}
```

CSS Selectors

Tags

Classes

Pseudo

ID

Pseudo Selectors

Make use of the : operator and must be combined with another selector.
Examples, include element states or positions like :hover, :focus, :after, :before.

```
.box {
    width: 100px;
    height: 100px;
}

/* box with our red class will turn red on hover */
.box.red:hover {
    background-color: red;
}

/* A normal box will turn black */
.box:hover {
    background-color: black;
}
```

CSS Selectors

Tags

Classes

Pseudo

ID

IDs and special selectors

IDs are denoted by a leading #, other special selectors include > and +.

```
/*
    Highest precedence but applies to only
    _one_ element.
*/

#nav {
    font-weight: bold;
}

/*
   The p child of the log will have opacity 0.5
*/
#logo > p {
    opacity: 0.5;
}
```

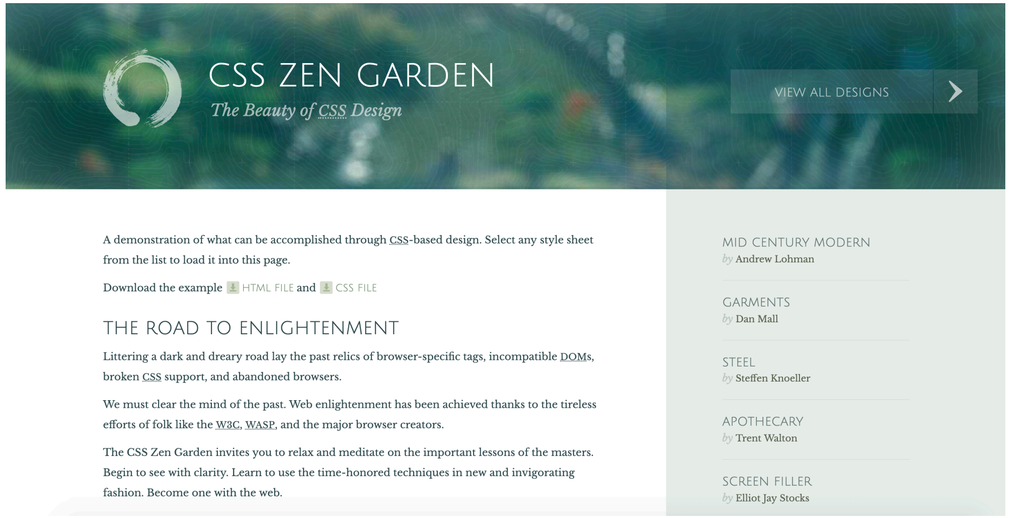
“Specificity is a weight that is applied to a given CSS declaration, determined by the number of each selector type in the matching selector.”

Mozilla Developer Network
https://developer.mozilla.org/en-US/docs/Web/CSS/Specificity

By combining selectors and specificity we can apply style rules as generally or specifically as we choose.

Mozilla Developer Network
https://developer.mozilla.org/en-US/docs/Web/CSS/Specificity

Same HTML: different CSS



CSS Zen Garden
http://www.csszengarden.com

CSS specificity

1. Inline Styles

Style rules declared inline are always highest precedence

2. Order of Declaration

Later rules of equal specificity take precedence over earlier rules.

3. ID, Class, tag

Highest order specificity takes precedence, more selectors add specificity

CSS specificity

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JAVASCRIPT

- Initially; facilitates animation, form validation, warnings, prompts.
- Extended in mid-2000s to support XHR/ AJAX to become core part of modern web

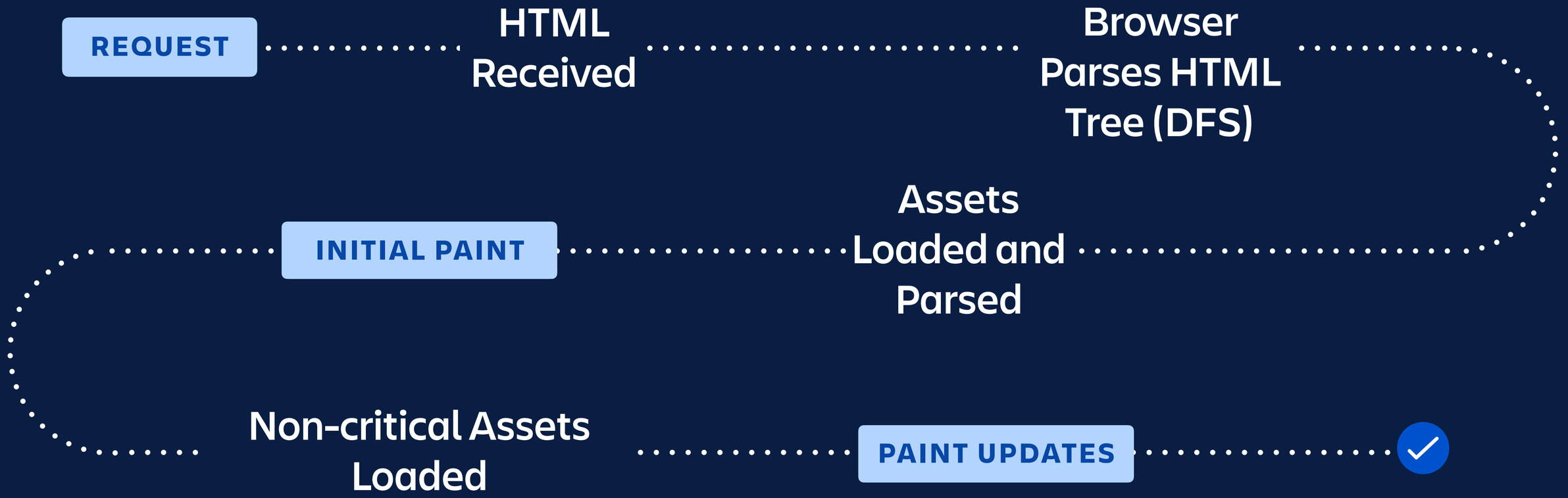
QUESTION

How do these three components fit together in practice?

The Web Document

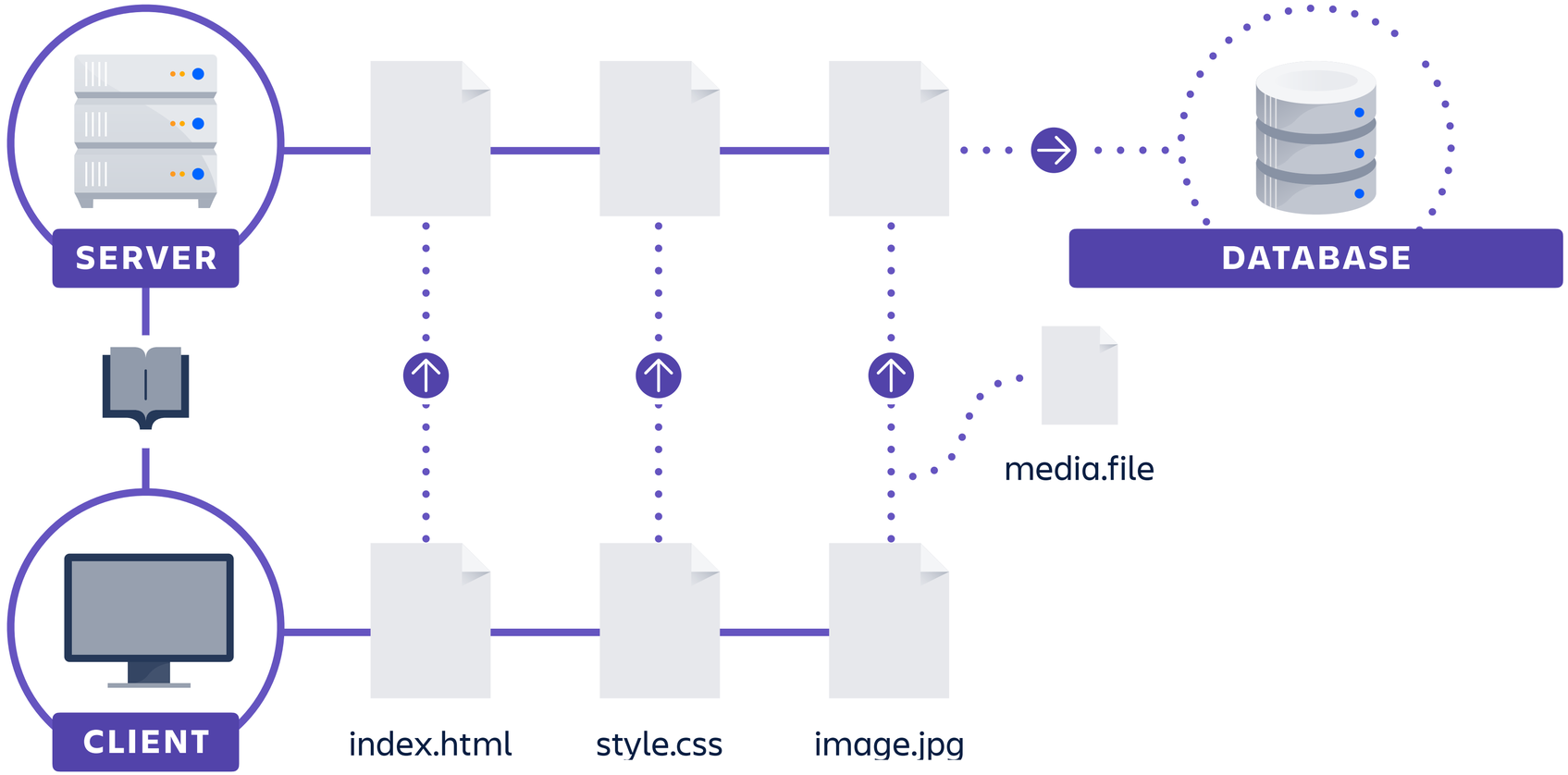
These three building blocks come together to form a web document which our browser can interpret and update.

BASIC WEB DOCUMENT TIMELINE



WEB BASICS

Server gets a request from your browser, serves HTML, which in turn asks for any additional assets.

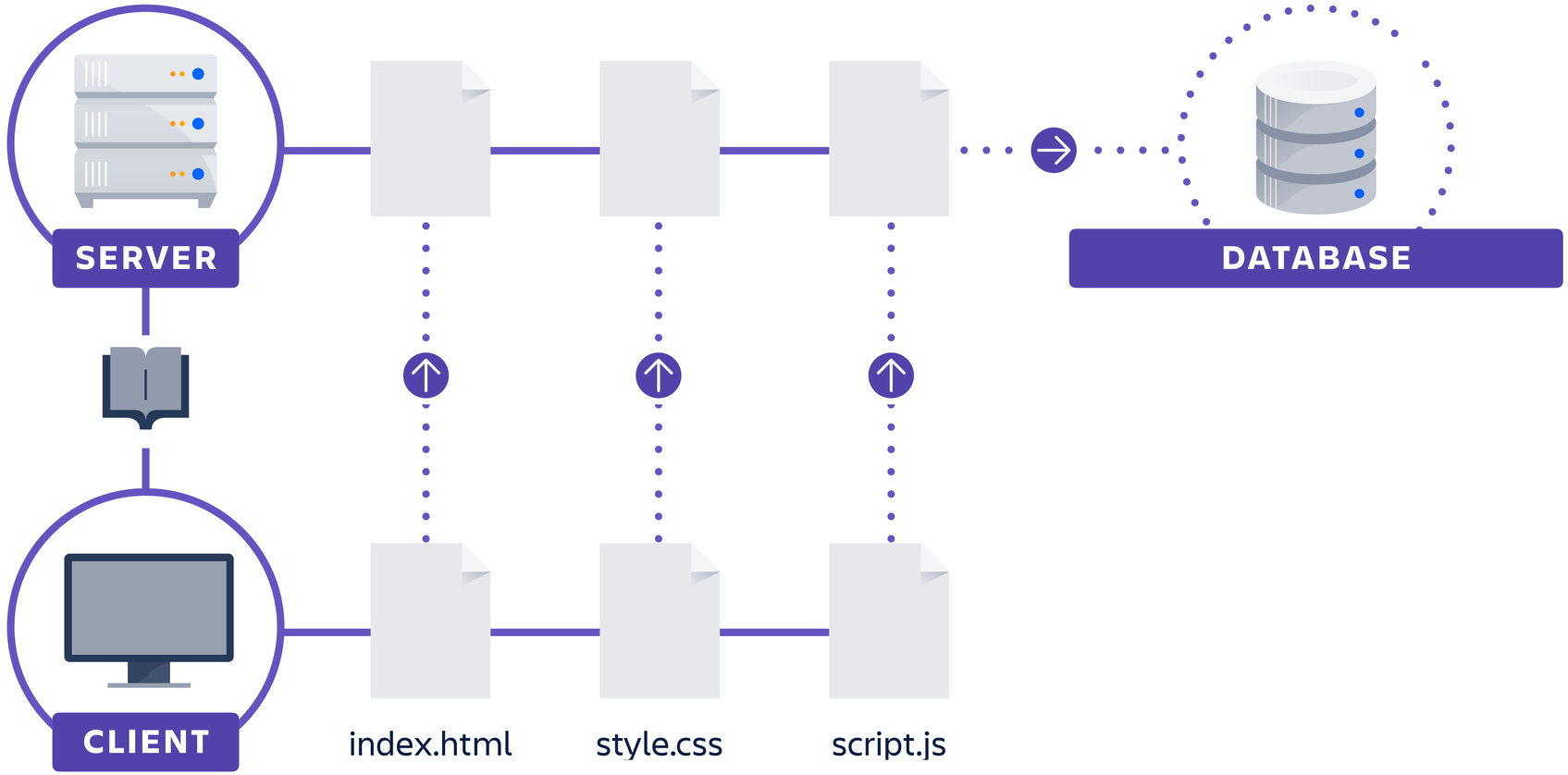


QUESTION

CSS and HTML seem pretty nifty – why do I need JavaScript?

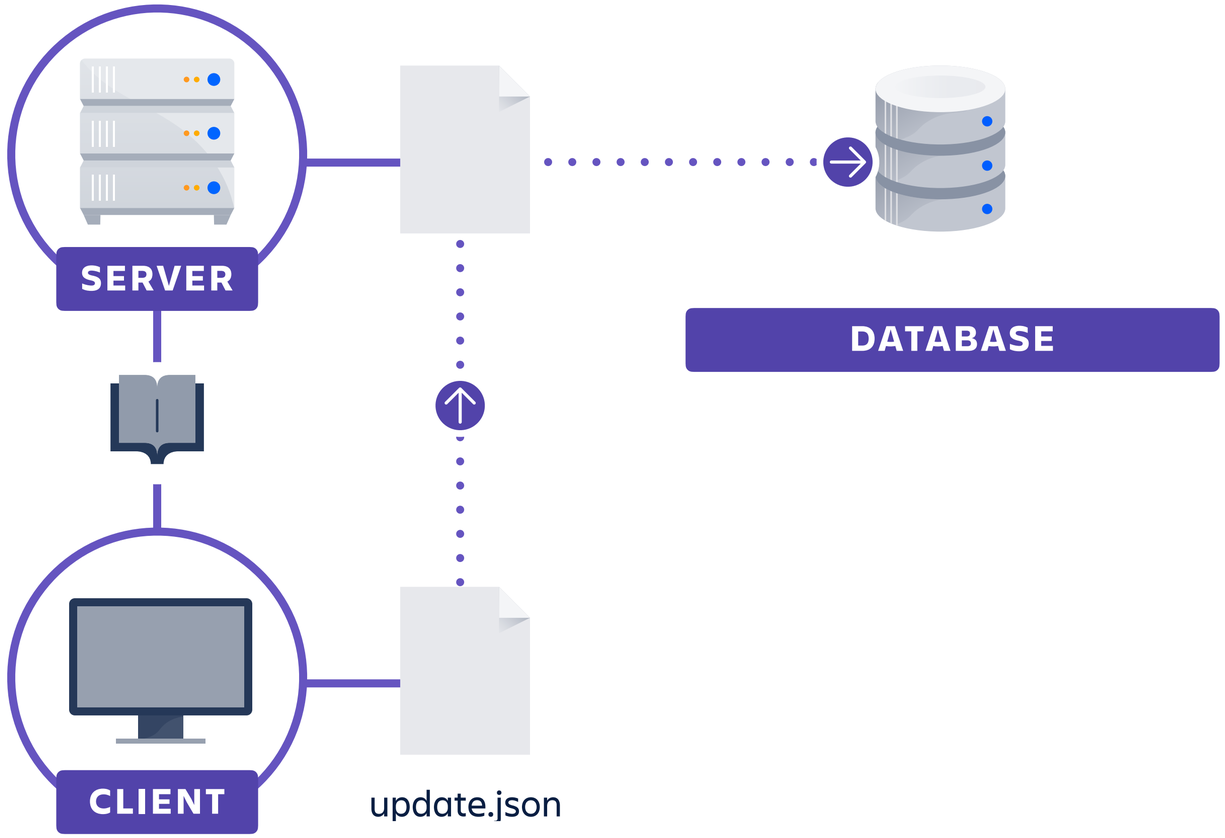
MODERN WEB

Similar initial setup but less reliant on server for CPU processing. Updates can happen in the background.



MODERN WEB

Updates only need to send critical information; significantly smaller payloads, no need to re-render the whole page.



You don’t need to understand all of this now. By the end of the course it will make more sense!