Introduction

Web Programming

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Course Description and Course Learning Outcomes

รายวิชานี้เน้นการฝึกทักษะการเขียนโปรแกรมสำหรับเว็บไซต์ โดยใช้โจทย์จริงและให้ผู้เรียนได้เรียนรู้ผ่านการกระบวนทำงานจริง โดยสิ่งที่ผู้เรียนเมื่อจบรายวิชานี้จะได้รับ ดังนี้

1. ผู้เรียนเข้าใจการทำงานของ web application
2. ผู้เรียนสามารถเขียน web application ได้ด้วยภาษา HTML / Java Script / CSS
3. ผู้เรียนสามารถเข้าใจการทำงานในส่วนของ Back end ในลักษณะ MVC (Model-View-Controller)
4. ผู้เรียนสามารถนำความรู้ไปประยุกต์ใช้เป็น web application ที่สามารถใช้งานได้จริง

Course Schedule

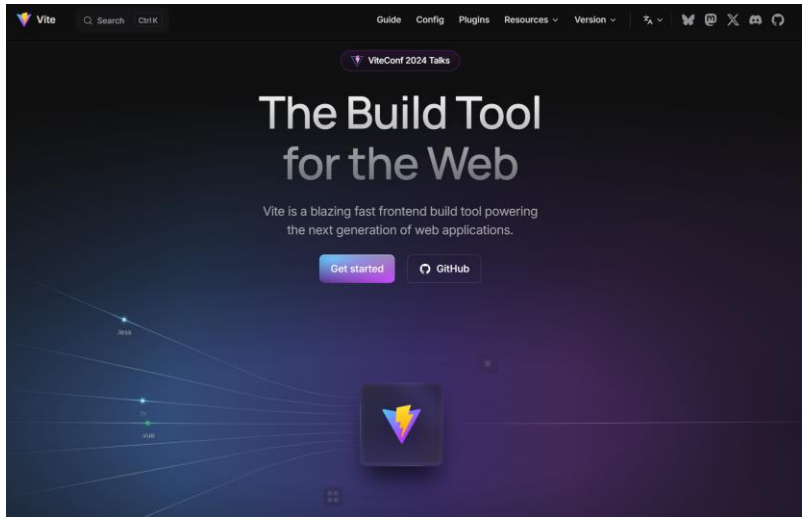
- ห้องเรียน FB303 วันอังคาร 13:30 – 16:30 น.
- ตารางเรียนสามารถปรับได้ตามความเหมาะสม

Ref: https://www.orangemantra.com/blog/3-things-that-must-be-given-attention-to-during-website-development/

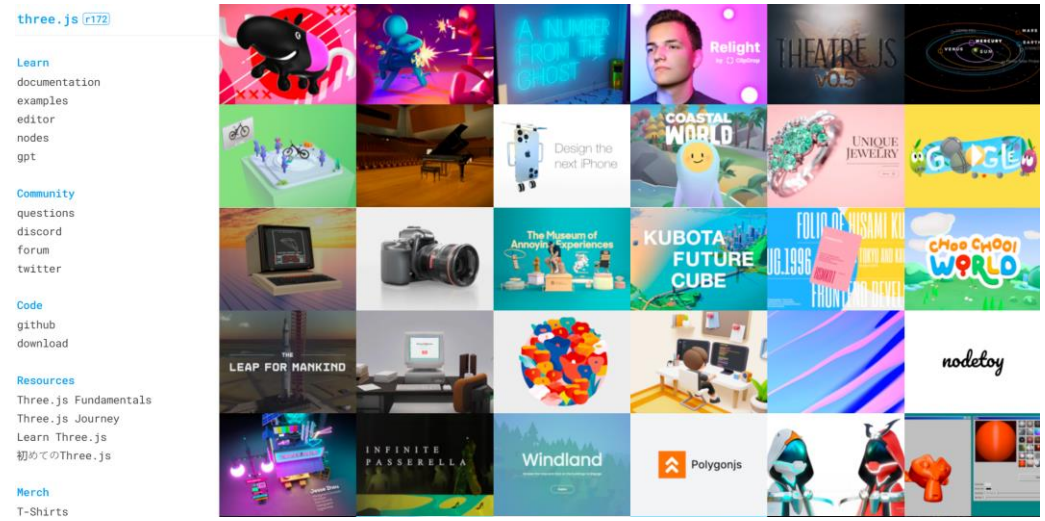
Date	Topic
14 Jan	Introduction
21 Jan	HTML5 & CSS
28 Jan	JavaScript
4 Feb	Node.js and React
11 Feb	Database
18 Feb	Exam 1 Break
25 Feb	WebGL and Three.js
4 Mar	React and React Three Fiber
11 Mar	A-Frame
18 Mar	Project Proposal
25 Mar	Exam 2 Break
22 Apr	Project
29 Apr	Project
6 May	Project
13 May	Project Presentation

https://forms.office.com/r/EDCBiHDHfm

What will you learn and expected Project

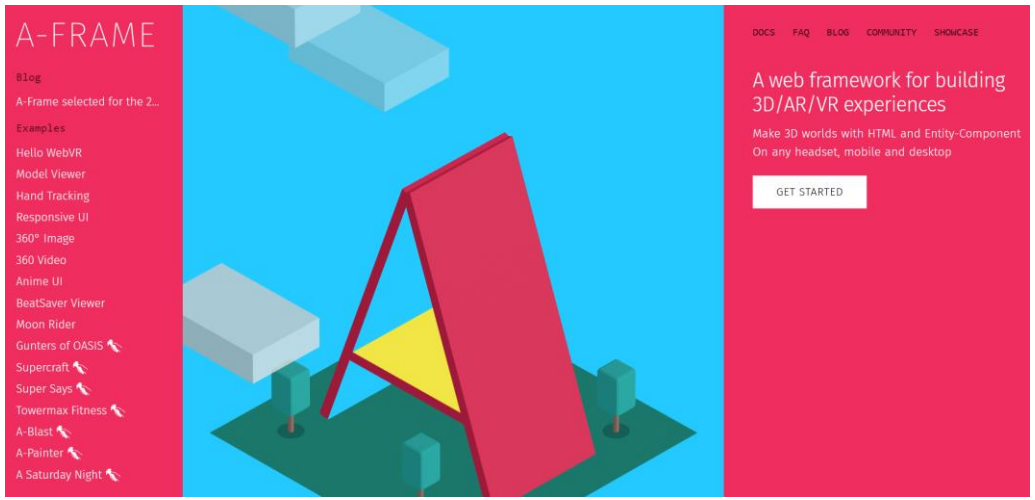


https://vite.dev/



https://threejs.org/

- https://threejs.org/examples/
- https://www.david-hckh.com/



https://aframe.io/

Web Application

Front End

- HTML
- CSS
- JavaScript
- React

Back End

- Node.js
- Database: SQL, MongoDB

Framework

- Next / Vue / Svelte

UX/UI

Progressive Web Application (PWA)

WebGL

Self-learning

- สอนพื้นฐาน JavaScript ทั้งหมดแบบจบในคลิปเดียว by BorntoDev
  https://www.youtube.com/watch?v=PGZ7QiKdumo
- React for Everyone | สอน React ตั้งแต่เริ่มจนเขียนแอปได้ | Crash Course Series by PasaComputer
  https://www.youtube.com/watch?v=mXjxKhWNHNo
- Database Normalization ตั้งแต่ 1NF-3NF ในคลิปเดียว by BorntoDev
  https://www.youtube.com/watch?v=FJZe3faTwGg
- สอนพื้นฐาน SQL ทั้งหมดแบบจบในคลิปเดียว by BorntoDev
  https://www.youtube.com/watch?v=vd1qdnCX5RU
- Write Small UIs Effectively https://divize.io/
- Three.js Fundamentals https://threejs.org/manual/#en/fundamentals
- A-Frame https://aframe.io/docs/1.6.0/introduction/

Installation

- Development Tools
  - VS Code
  - Git
  - Figma
  - Dataflare
- Programming Language
  - HTML5 & CSS
  - JavaScript: Node.js
  - SQL

Full Stack Development

A full-stack web developer is a person who can develop both client and server software.

- Program a browser (e.g. using JavaScript, jQuery, Angular, or Vue)
- Program a server (e.g. using PHP, ASP, Python, or Node)
- Program a database (e.g. using SQL, SQLite, or MongoDB)

Client Software (Front-end)	Server Software (Back-end)
HTML	PHP
CSS	ASP
Bootstrap	C++
W3.CSS	C#
JavaScript	Java
ES5	Python
HTML DOM	Node.js
JSON	Express.js
XML	Ruby
jQuery	REST
Angular	Go
React	SQL
Backbone.js	MongoDB
Ember.js	Sass
Redux	Less
Storybook	Firebase.com
GraphQL	Parse.com
Meteor.js	PaaS (Azure and Heroku)
Grunt	
Gulp	

Popular Stacks

- LAMP stack: JavaScript - Linux - Apache - MySQL - PHP
- LEMP stack: JavaScript - Linux - Nginx - MySQL - PHP
- **MEAN stack: JavaScript - MongoDB - Express - AngularJS - Node.js**
- **MERN stack: JavaScript - MongoDB - Express - React.js - Node.js**
- **MEVN stack: JavaScript - MongoDB - Express - Vue.js - Node.js**
- Django stack: JavaScript - Python - Django - MySQL
- Ruby on Rails: JavaScript - Ruby - SQLite - Rails

Full Stack JavaScript Benefits

- Code reuse. Shared libraries, templates, and models.
- Best practice accumulated by 20 years of JavaScript.
- JavaScript is an evolving standard with a bright future.
- Good tutorials. Easy to learn.
- No compilation!!! Faster development.
- Great distribution: npm.
- GitHub repository. Git workflow.

Web Programming

Front End

- HTML https://www.w3schools.com/html/html_intro.asp
- CSS https://www.w3schools.com/css/css_intro.asp
- JavaScript https://www.w3schools.com/js/js_intro.asp

Back End

- Node.js https://www.w3schools.com/nodejs/default.asp

Database

- SQL https://www.w3schools.com/sql/default.asp
- MYSQL https://www.w3schools.com/mysql/default.asp
- PostgreSQL https://www.w3schools.com/postgresql/index.php
- MongoDB https://www.w3schools.com/mongodb/index.php

HTML stands for **H**yper **T**ext **M**arkup **L**anguage

HTML is the **standard markup** language for Web pages

HTML **elements** are the building blocks of HTML pages

HTML elements are represented by **<> tags**

CSS stands for **C**ascading **S**tyle **S**heets

CSS describes how **HTML** elements are to be **displayed**

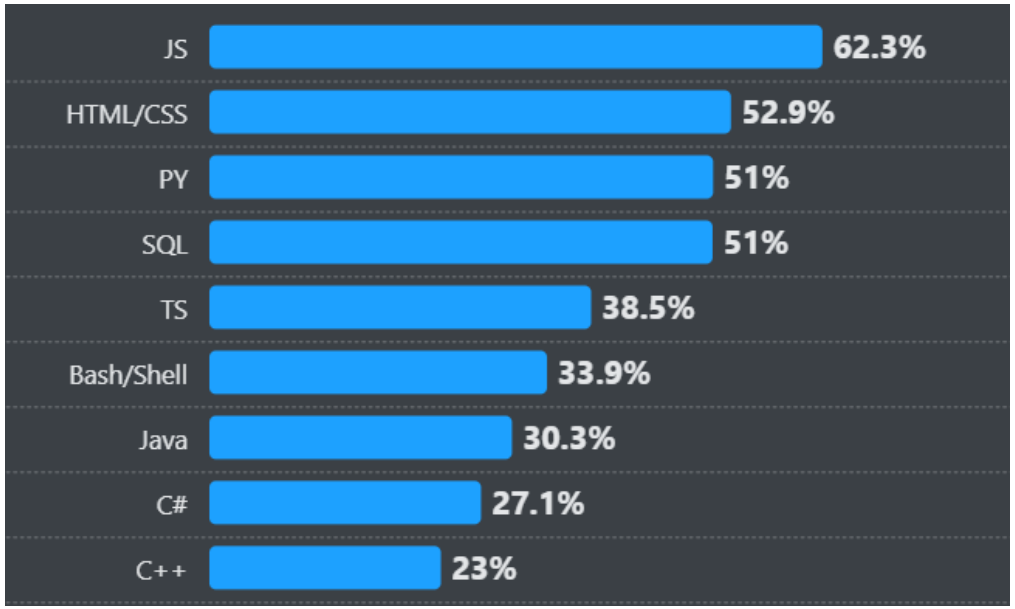
JavaScript is the **Programming Language** for the Web.

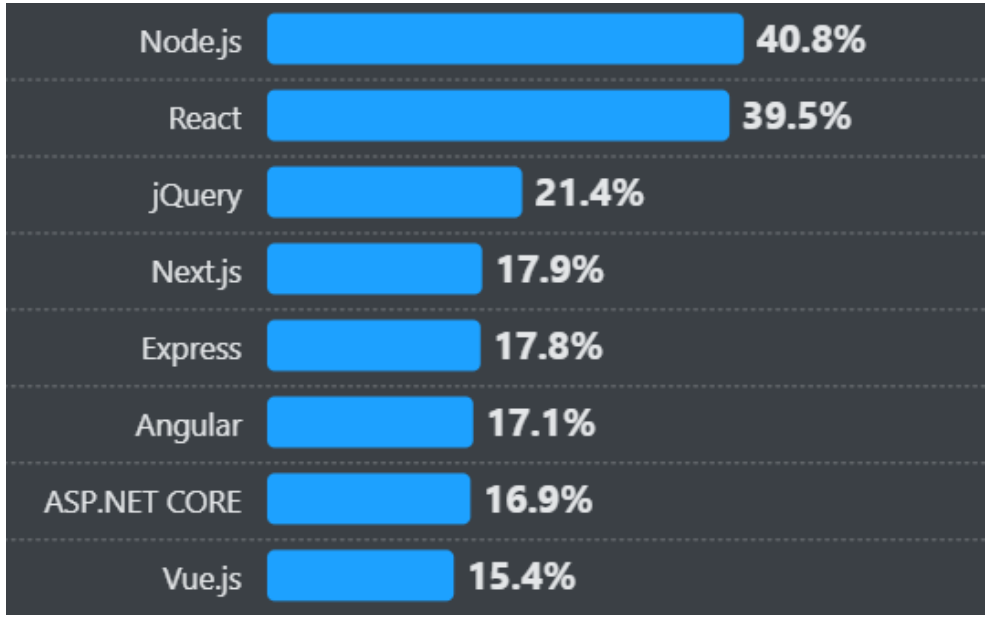
JavaScript can update and change both **HTML** and **CSS.**

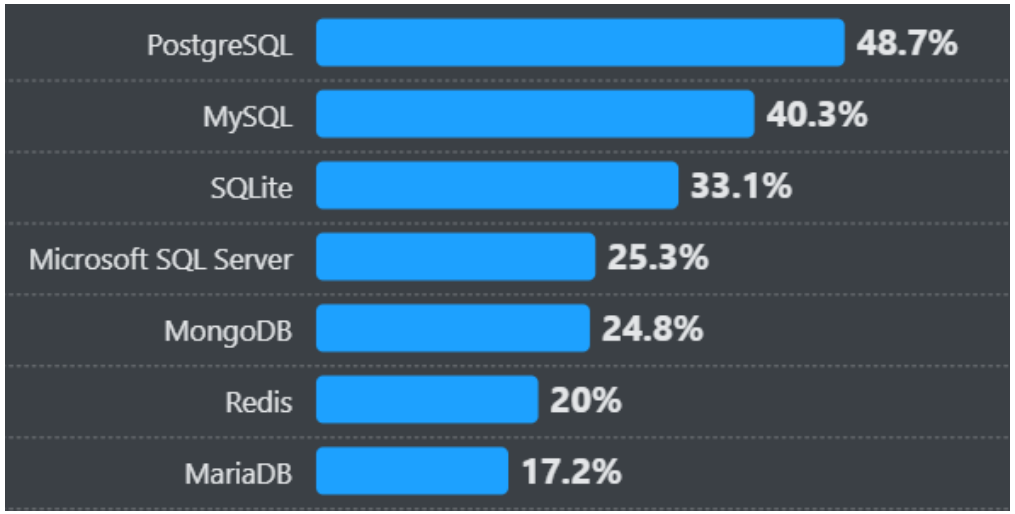
JavaScript can **calculate**, **manipulate** and **validate** data.

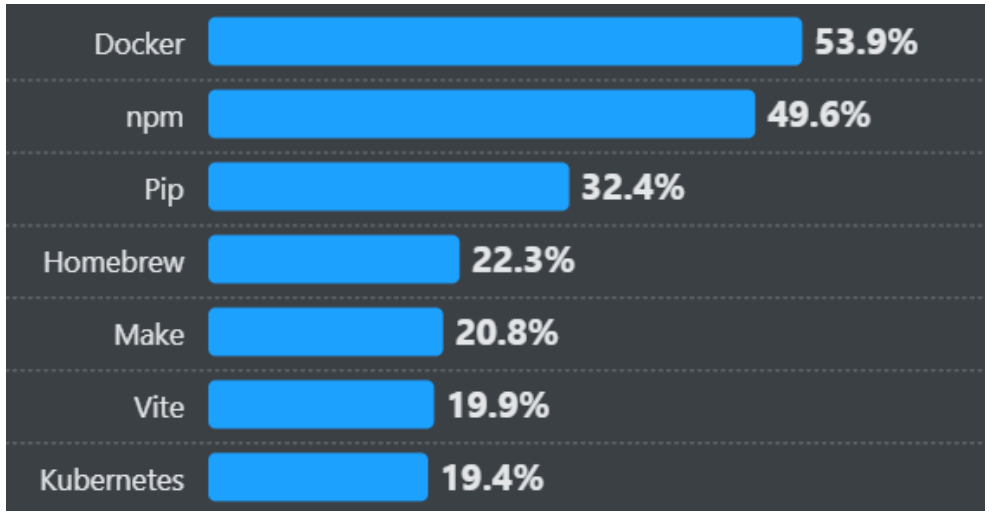
Stack Overflow Developer Survey 2024

https://survey.stackoverflow.co/2024/

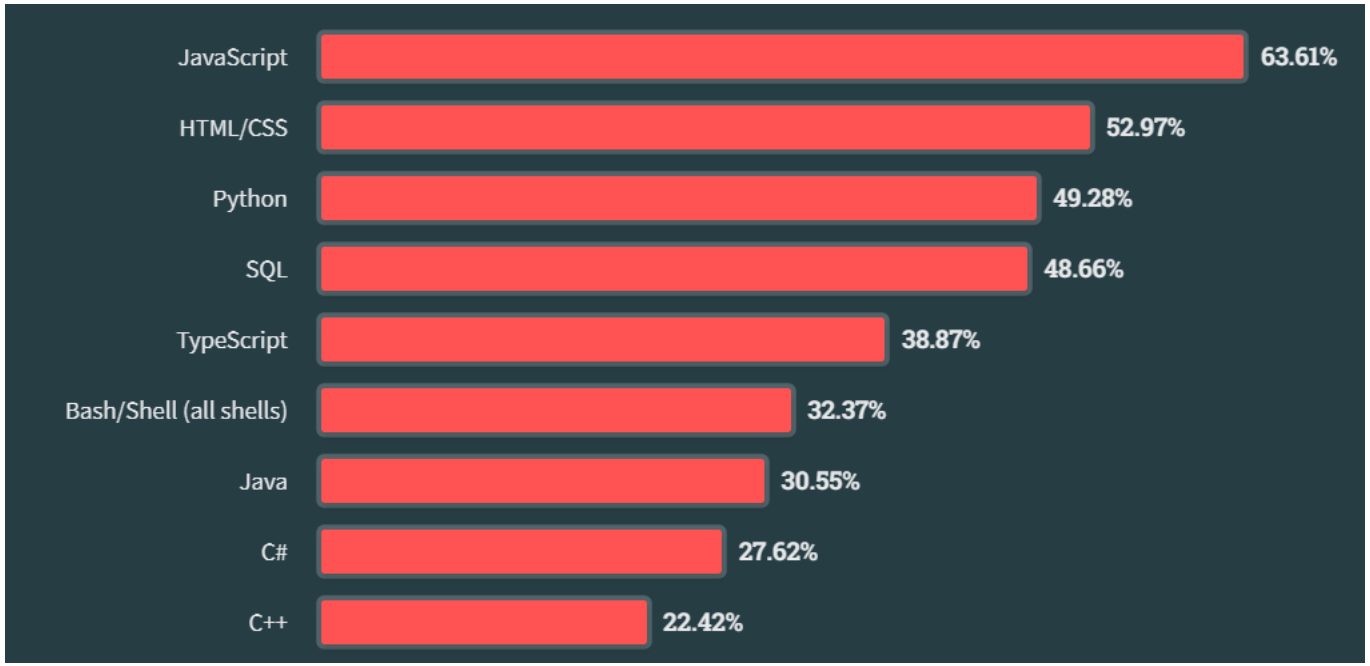


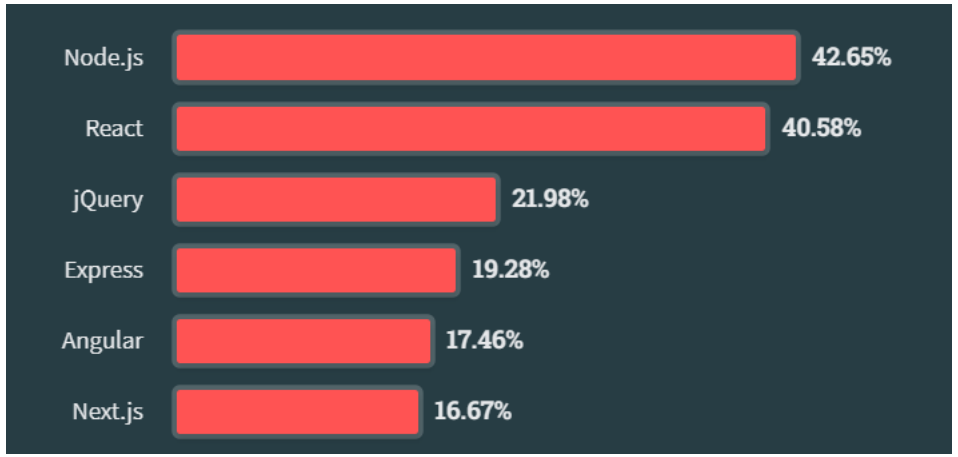


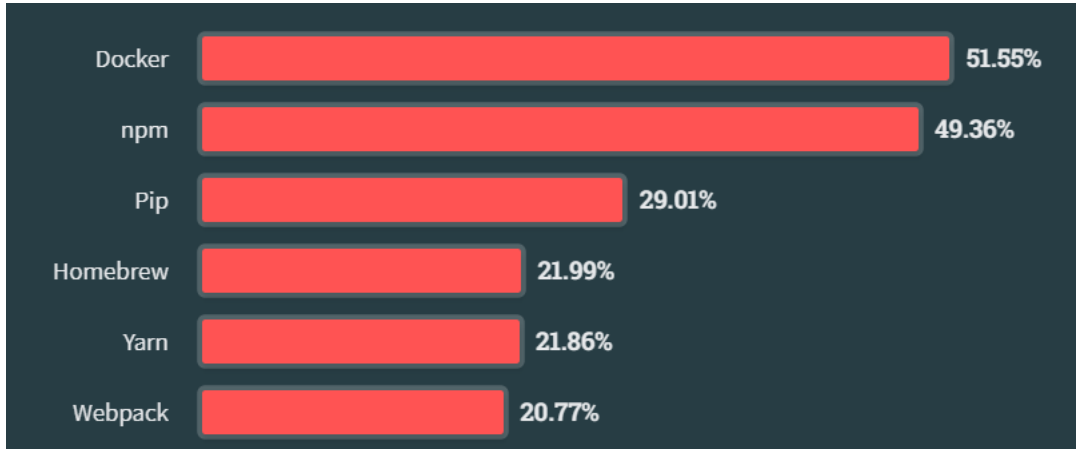




Stack Overflow Developer Survey 2023







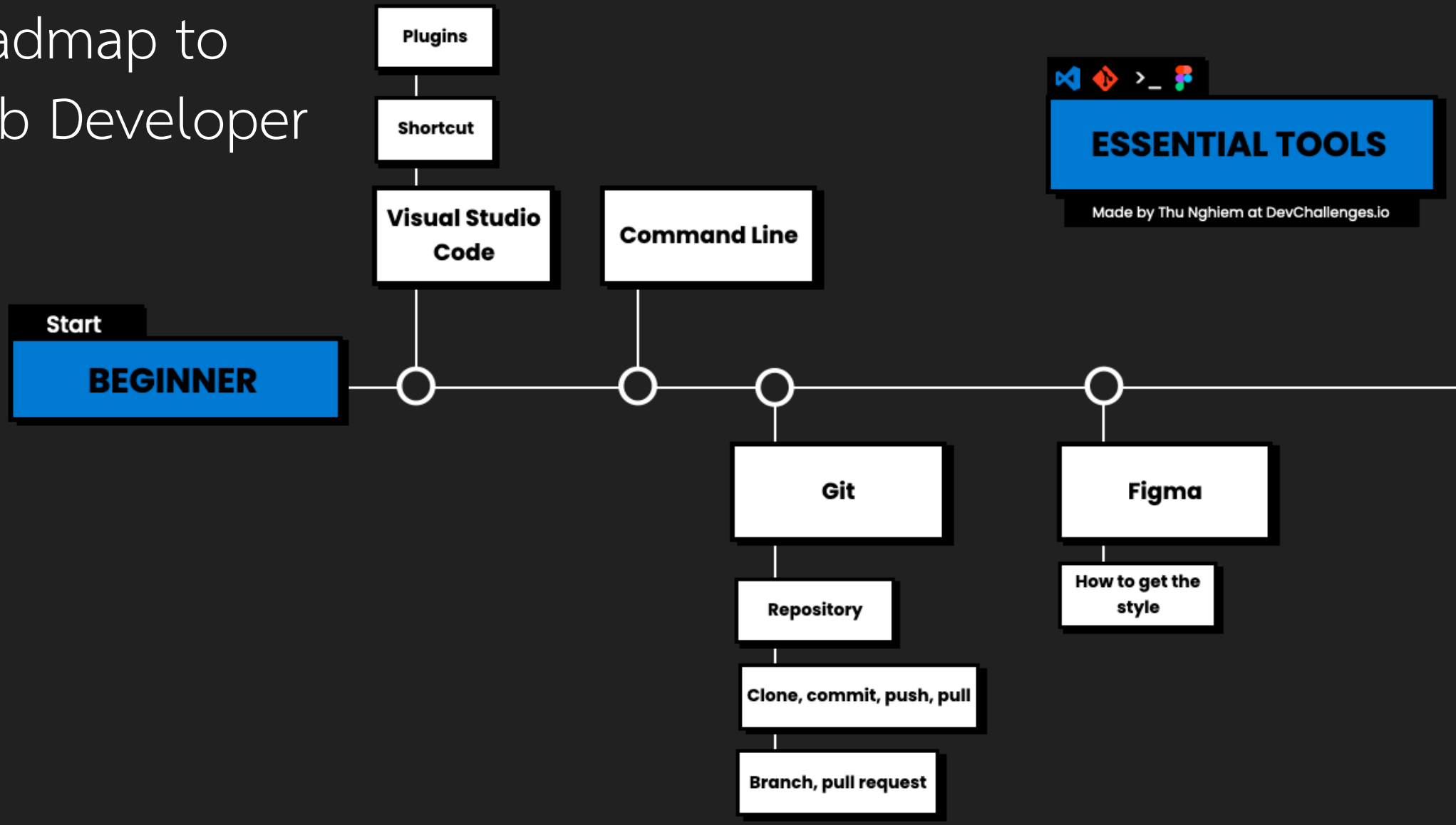
Stack Overflow Developer Survey 2023

Parameters	Angular	React
Developed By	Google	Facebook
Release Year	2009	2013
Written In	TypeScript	JavaScript
Technology Type	Full-fledged MVC framework written in JavaScript	JavaScript library (View in MVC; requires Flux to implement architecture)
Concept	Brings JavaScript into HTML Works with the real DOM Client-side rendering	Brings HTML into JavaScript Works with the virtual DOM Server-side rendering
Data Binding	Two-way data binding	One-way data binding
Language	JavaScript + HTML	JavaScript + JSX
Learning Curve	Steep	Moderate
UI Rendering	Client/Server-Side	Client/Server-Side
Best Suited For	Highly active and interactive web apps	Larger apps with recurrent variable data
App Structure	Fixes and complicated MVC	Flexible component-based view
Dependency Injection	Fully supported	Not supported
Performance	High	High
DOM Type	Real	Virtual
Popular Apps	IBM, PayPal, Freelancer, Upwork	Facebook, Skype, Instagram, Walmart

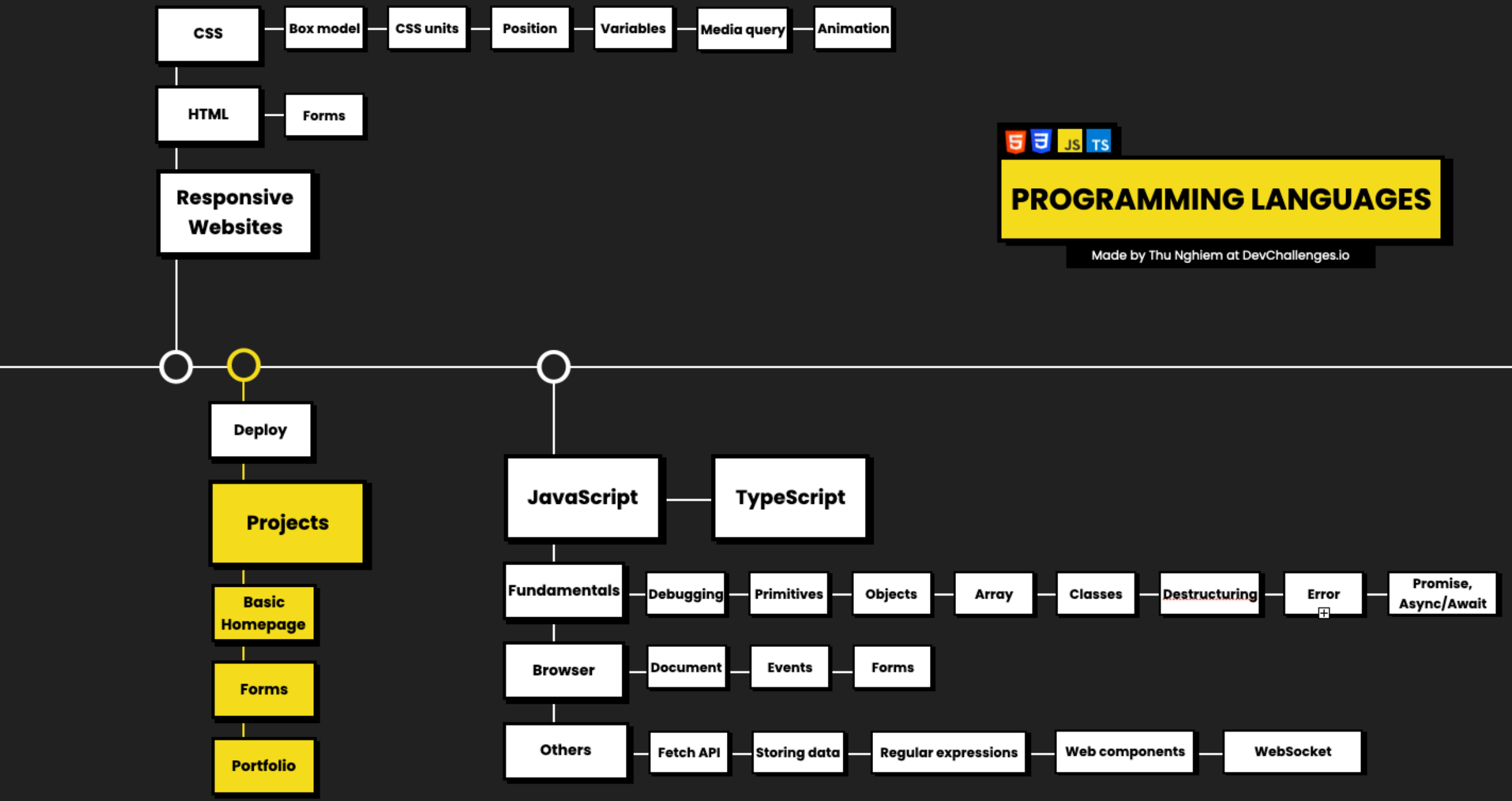
VS Code Useful Commands

- Find and run all commands: `Command/Control + Shift + P`
- Emmet tools : Emmet Cheat Sheet
- Type the exclamation make (!) and press tab or enter to generate an HTML template
- Format Document: `Shift + Alt + F`
- Extensions:
  - Live Server

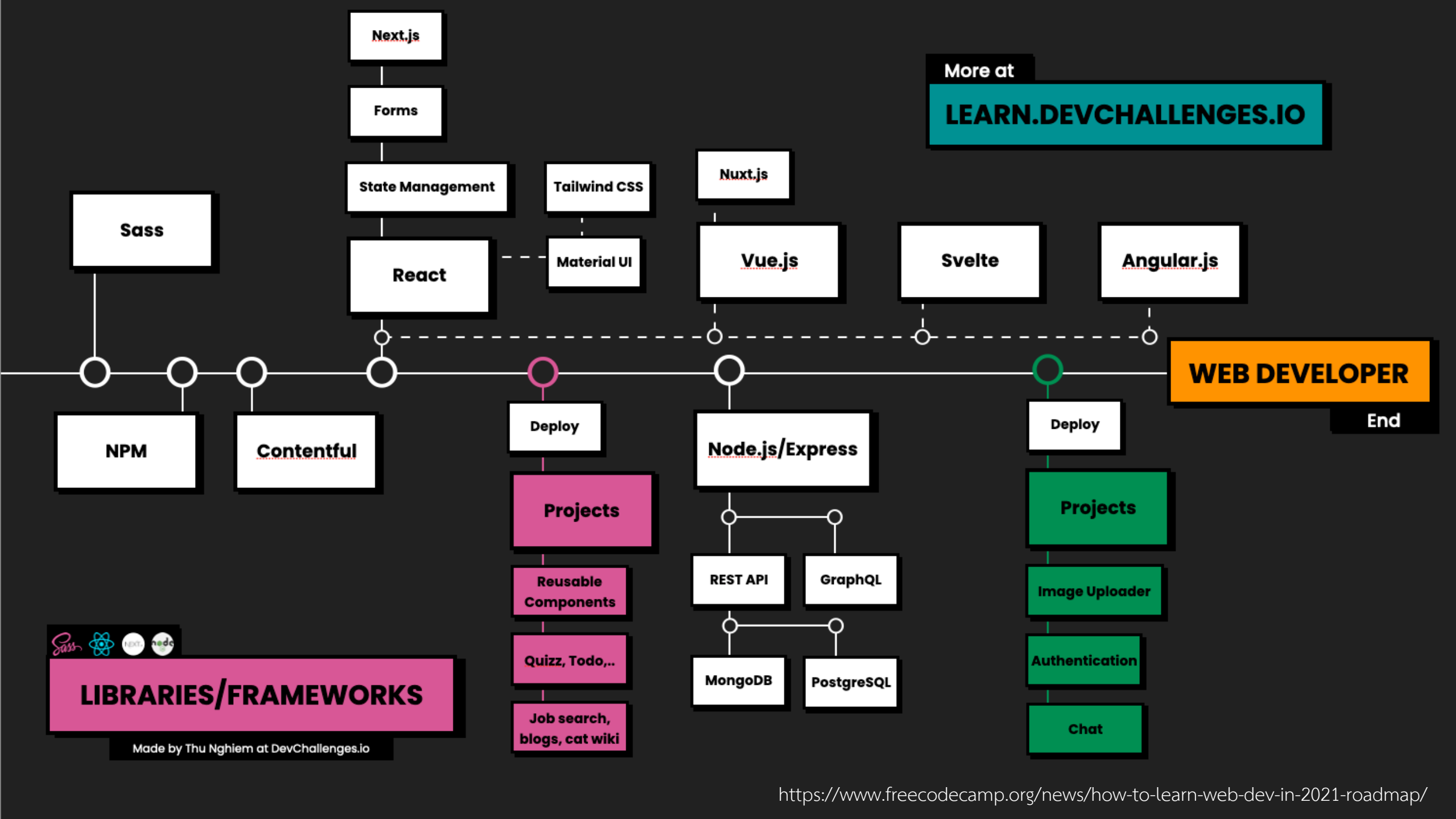
Roadmap to Web Developer



https://www.freecodecamp.org/news/how-to-learn-web-dev-in-2021-roadmap/



https://www.freecodecamp.org/news/how-to-learn-web-dev-in-2021-roadmap/



https://www.freecodecamp.org/news/how-to-learn-web-dev-in-2021-roadmap/

Web Design Playground

- https://webdesignplayground.io/

JavaScript

- **Node.js** is a JavaScript runtime written in C++ which uses **V8 Engine** by Google and **libuv** event loop to perform asynchronous operations in the background.
- **Electron.js** is used for cross-platform desktop apps.
- **React.js** for Web development and React Native for mobile development

- V8 is Google’s open source high-performance JavaScript and WebAssembly engine, written in C++.
- JavaScript engine is used to convert JavaScript/Typescript code into bytecode (interpreter) or optimized machine code (compiler) so the computer can execute it.

01 Hello World

- Create new file: hello.html

```
<html>

<head>
</head>

<body>
    <h1>Hello, World!</h1>
</body>

</html>
```

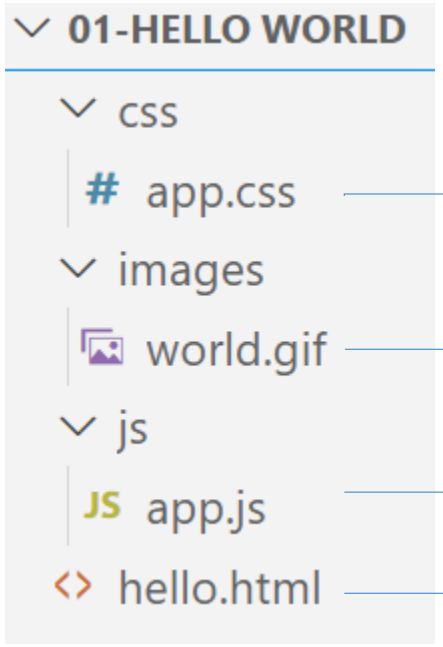
Hello, World!

```
<html>
  <head> </head>

  <body>
    <h1>Hello, World!</h1>
    <h2>Welcome to JavaScript</h2>
    <script>
      document.write("Hello JavaScript by JavaScript");
    </script>
  </body>
</html>
```

Hello, World!

Welcome to JavaScript

Hello JavaScript by JavaScript




```
<html>

<head>
    <title>Hello</title>
    <link rel="stylesheet" href="css/app.css">

</head>

<body>
    <div class="globe">
       <img src="images/world.gif" class="globe_image"></div>
    <h1 class="GB"> Hello </h1>
    <h1 class="ES"> Hola </h1>
    <h1 class="FR"> Bonjour </h1>
    <h1 class="IT"> Salve </h1>
    <h1 class="GE"> Guten tag </h1>
    <h1 class="JP"> Konnichiwa </h1>
    <h1 class="RU"> Zdravstvuyte </h1>
    <h1 class="KO"> Anyoung Haseyo </h1>
    <h1 class="PO"> Dzien Dobry </h1>
    <h1 class="HI"> Namaste </h1>
    <h1 class="HE"> Shalom </h1>
    <h1 class="SW"> God Dag </h1>
    <h1 class="TH"> สวัสดี </h1>
    <script src="js/app.js"></script>
</body>

</html>
```

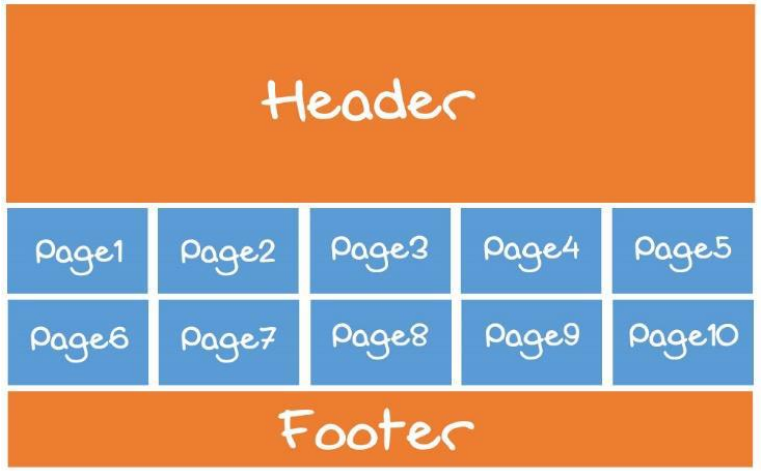
https://wddtrw.co.uk/resources/learntocode/images/world.gif

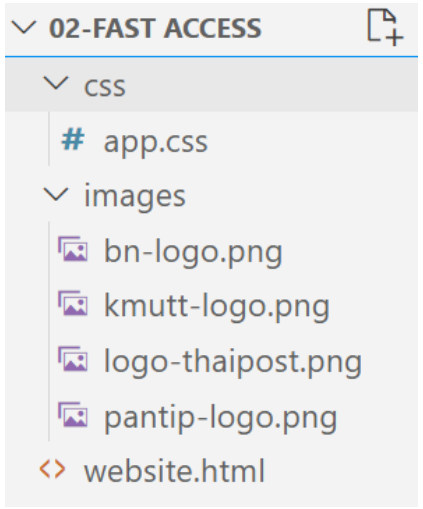
```
html, body {
    margin: 0px 0px 0px 0px;
    background-image: linear-gradient(to
bottom right, #95d9f9, #ae4bc3);
}
h1 {
    font-family: tahoma, sans-serif;
    opacity: 60%;
    position: absolute;
    -webkit-text-stroke: 2px white;
}
.globe {
    text-align: center;
    margin-top: 50px;

}
.globe_image{
    height: 90vh;
}
```

```
//Generate salutations
//t-top, l-left, c-colour, s-font-size, z-z-index, id-class

function sals(t, l, c, s, z, id) {
  var sal = document.getElementsByClassName(id);
  sal[0].style.top = t;
  sal[0].style.left = l;
  sal[0].style.color = c;
  sal[0].style.fontSize = s;
  sal[0].style.zindex = z;
}

sals("5%", "50%", "#1b95cd", "250px", "20", "GB");
sals("1%", "10%", "red", "150px", "19", "ES");
sals("15%", "30%", "blue", "100px", "18", "FR");
sals("35%", "60%", "green", "170px", "17", "IT");
sals("54%", "20%", "orange", "170px", "16", "GE");
sals("54%", "35%", "yellow", "100px", "15", "JP");
sals("10%", "55%", "grey", "80px", "14", "RU");
sals("27%", "21%", "lightgrey", "100px", "13", "KO");
sals("37%", "31%", "#333", "65px", "12", "PO");
sals("67%", "51%", "pink", "125px", "11", "HI");
sals("47%", "11%", "lightblue", "115px", "10", "HE");
sals("27%", "31%", "lightgreen", "185px", "9", "SW");
sals("5%", "40%", "magenta", "135px", "9", "TH");
```


Hola
สวัสดี
zdravstvuyte
Bonjour
Hello
Anyoung Haseyo
Dzien Dobry
God Dag
Salve
Shalom
Konnichiwa
Guten tag
Namaste

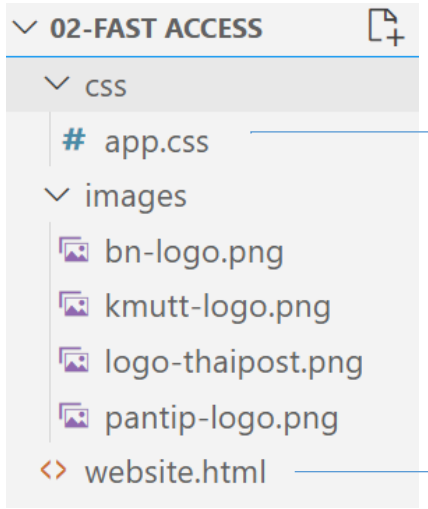
02 Fast Access Webs






```html
<html>
  <head>
    <title>Fast Access Web Menu</title>
    <link rel="stylesheet" href="css/app.css" />
  </head>
  <body>
    <header>
      <h1>Fast Access Web Menu</h1>
    </header>
    <div class="wrapper">
      <div class="page">
        <a href="" alt="" title="">
          <img src="" title="" alt="" class="" />
        </a>
      </div>
      <div class="page">
        <a href="" alt="" title="">
          <img src="" title="" alt="" class="" />
        </a>
      </div>
    </div>
    <footer>
      <p>&copy; Copyright SEALab@FIBO 2024</p>
    </footer>
  </body>
</html>
```

```css
html,body {
    margin: 0px;
}

header {
    background-color: #EB8716;
    color: #fff;
    width: 98%;
    height: 200px;
    margin: 1%;
}

header h1 {
    text-align: center;
    font-family: 'Franklin Gothic Medium', 'Arial Narrow', Arial, sansserif;
    padding: 60px;
    font-size: 50px;
}

.wrapper {
    background-color: #90CEE8;
    width: 98%;
    height: 400px;
    margin: 1%;
}

.wrapper .page {
    width: 24%;
    height: 180px;
    background-color: #006F9E;
    display: inline-block;
    margin: 0.4%;
}

footer {
    background-color: #006F9E;
    color: #fff;
    width: 98%;
    height: 60px;
    margin: 1%;
}

footer p {
    font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
    text-align: center;
    padding: 20px;
}
```



Add more

```css
.image_link{
    height: 160px;
    width: 18.5vw;
    margin: 2% 0 1% 10%;
}
.image_link:hover{
    filter: grayscale(70%);
}
```

```html
<html>
  <head>
    <title>Fast Access Web Menu</title>
    <link rel="stylesheet" href="css/app.css" />
  </head>
  <body>
    <header>
      <h1>Fast Access Web Menu</h1>
    </header>
    <div class="wrapper">
      <div class="page">
        <a href="https://www.blognone.com" alt="Visit Blognone" title="Visit Blognone">
          <img src="images/bn-logo.png" title="Blognone" alt="Blognone Link" class="image_link" />
        </a>
      </div>
      <div class="page">
        <a href="https://www.kmutt.ac.th/" alt="Visit KMUTT" title="Visit KMUTT">
          <img src="images/kmutt-logo.png" title="KMUTT" alt="KMUTT Link" class="image_link" />
        </a>
      </div>
      <div class="page">
        <a href="" alt="" title="">
          <img src="" title="" alt="" class="" />
        </a>
      </div>
    </div>
    <footer>
      <p>&copy; Copyright SEALab@FIBO 2024</p>
    </footer>
  </body>
</html>
```

Fast Access Web Menu

Fun 01: My First Website

ให้ทำเว็บไซต์โดยมี pages ดังต่อไปนี้

1. หน้าเว็บแสดงรายวิชาที่ลงทะเบียนเรียนในเทอมนี้
2. หน้าเว็บแสดงเว็บไซต์ที่ชื่นชอบ 8 ที่ โดยสามารถคลิกไปยังเว็บไซต์นั้นได้