



Bachelor of Science in Computer Science (English Program)

School of Information Technology

King Mongkut's University of Technology Thonburi

CSC105 Web Application Development (2/2022)

Learning Guide

Topic: Introduction to Web Development

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Overview of web development technology.

1.1 HTML

HTML (HyperText Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content. Basically, Think of it as a structure of a house. HTML is wood, concrete and pillar combined just enough to make a structure of the house.

Ref. [HTML: HyperText Markup Language | MDN \(mozilla.org\)](https://developer.mozilla.org/en-US/docs/Web/HTML)

1.2 CSS

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS describes how elements should be rendered on screen, on paper, in speech, or on other media. CSS is a color of the house or something that decorate the house.

Ref. [CSS: Cascading Style Sheets | MDN \(mozilla.org\)](https://developer.mozilla.org/en-US/docs/Web/CSS)

1.3 JavaScript

JavaScript (JS) is a lightweight, interpreted, or just-in-time compiled programming language with first-class functions. While it is most well-known as the scripting language for Web pages, many non-browser environments also use it, such as Node.js, Apache CouchDB and Adobe Acrobat. JavaScript is a prototype-based, multi-paradigm, single-threaded, dynamic language, supporting object-oriented, imperative, and declarative (e.g. functional programming) styles. Think of it as a functionality of the house, such as Light switch, fan or something that you can interact with.

Ref. [JavaScript | MDN \(mozilla.org\)](https://developer.mozilla.org/en-US/docs/Web/JavaScript)

History of Web

Ps. There is no clean-cut timeline of web development. On the other hand, it depends on what criteria you will use to categorize them. The example below is one of the well-known timeline of web development.



Web 1.0
read-only
static



Web 2.0
read-write
interactive



Web 3.0
read-write-trust
verifiable

<https://www.impactmillions.org/wp-content/uploads/2023/01/Group-2.webp>

2.1 Web 1.0

First version of the Web consisted of a few people creating web pages and content and web pages for a large group of readers, allowing them to access facts, information, and content from the sources.

Characteristic: Static, on-way-communication, Centralized.

2.2 Web 2.0

Web 2.0 is many people creating even more content for a growing audience. Web 1.0 focused on reading; Web 2.0 focused on participating and contributing.

Characteristic: Participation, Community, Two-way-communication.

2.3 Web 3.0

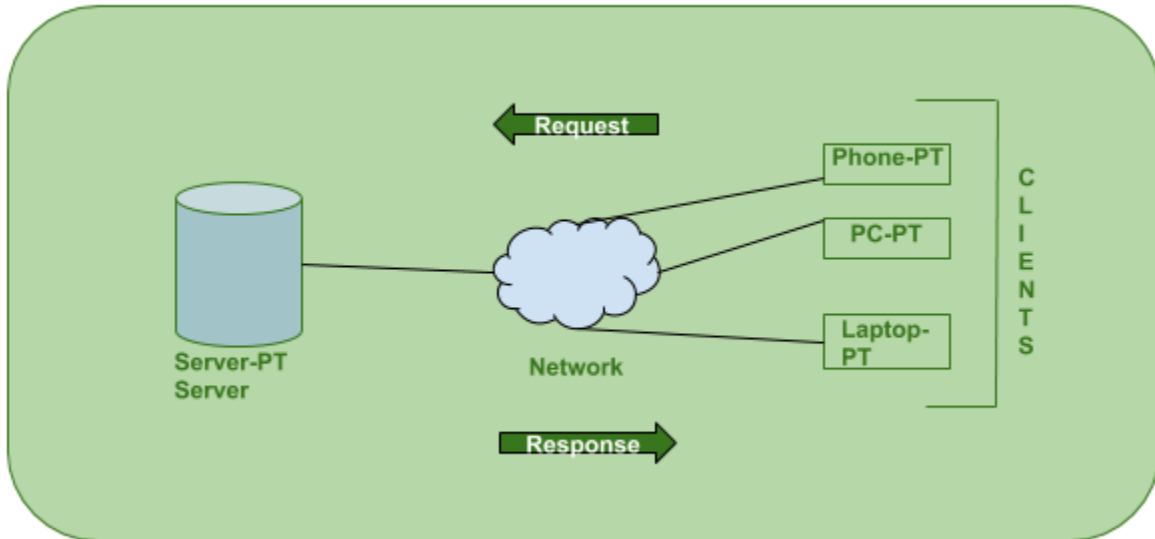
Web 3.0, which is also referred to as Web3, is built on a foundation consisting of the core ideas of decentralization, openness, and more excellent user utility. Web 3.0 isn't quite ready yet, so the meaning can change overtime.

Characteristic: Decentralized, Highly interactive

Ref: [What is Web 1.0, Web 2.0, and Web 3.0? Definitions, Differences & Similarities \(simplilearn.com\)](https://www.simplilearn.com/What-is-Web-1.0-Web-2.0-and-Web-3.0-Definitions-Differences-&Similarities)

Today of Web development

3.1 Client-Server Model



The Client-server model is a distributed application structure that partitions task or workload between the providers of a resource or service, called servers, and service requesters called clients. In the client-server architecture, when the client computer sends a request for data to the server through the internet, the server accepts the requested process and deliver the data packets requested back to the client. Clients do not share any of their resources.

Ref: [Client-Server Model - GeeksforGeeks](#)

3.2 Rest API



A request is sent from client to server in the form of a web URL as HTTP GET or POST or PUT or DELETE request. After that, a response comes back from the server in the form of a resource which can be anything like HTML, XML, Image, or JSON. But now JSON is the most popular format being used in Web Services.

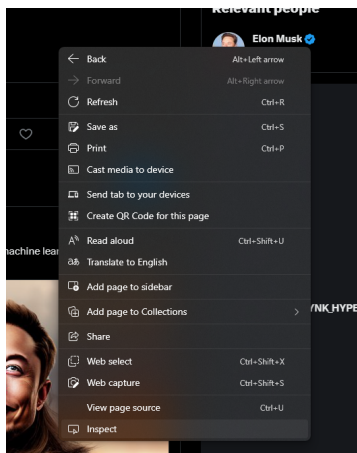
3.2.1 Example of Rest API -Twitter

You can see the real example from twitter.

Take this POST as an example: [Elon Musk on Twitter: "Rewatching Step Brothers ... so good" / Twitter](#)

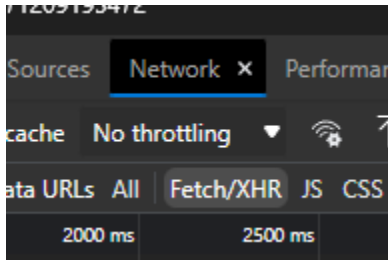
If you are on chrome or edge you can

1. Right Click at a blank space of webpage.
2. Choose Inspect.

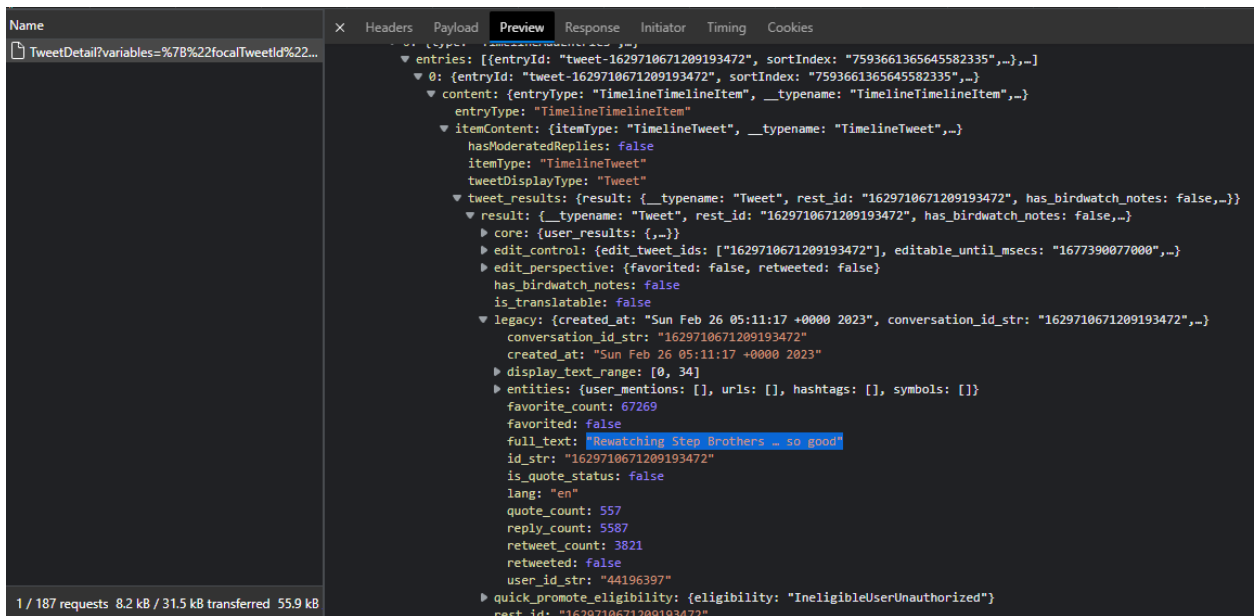


Introduction to Web Development

3. Go to network tab.



4. Refresh and search for “TweetDetail”



If you Click on preview, you will find the content of the tweet given above and other attributes as well. Twitter clients use this information and show it to you via their beautiful UI.

Web Framework.

4.1 What is web framework.

A framework is a structure that you can build software on. It serves as a foundation, so you're not starting entirely from scratch. Frameworks are typically associated with a specific programming language and are suited to different types of tasks.

Ref: [What Is a Framework? \(codecademy.com\)](https://www.codecademy.com/learn/what-is-a-framework)

4.2 web framework vs non web framework.

Essentially the allure of these is the amount of time that is saved and the resulting efficiency in getting a project rolled out faster because there's a lot less of the initial work to be done.

Ref: [Web Frameworks: The Complete 2023 Beginner's Guide \(careerfoundry.com\)](https://www.careerfoundry.com/blog/web-frameworks-the-complete-2023-beginners-guide/)

4.2.1 Example of web application with/without web framework.

4.2.1.1 A todo list with only HTML,CSS,Javascript.

<https://codesandbox.io/s/simple-todolist-in-vanilla-qd4h4c>

4.2.1.2 A todo list with React.

<https://codesandbox.io/s/todo-react-e7jwc7>

4.2.1.3 A todo list with Svelte

<https://codesandbox.io/s/todo-svelte-jcljln>

Conclusion: You can see that with the Framework provided, the amount of code is less and easier to understand.

4.3 Frontend Framework.

4.3.1 Useful frontend library.

Here are some useful libraries (for react) you might want to read. We will learn some of these in the next class as well.

MUI	MUI Core: Ready to use components, free forever
Tanstack Query	TanStack Query React Query, Solid Query, Svelte Query, Vue Query
React Router	Home v6.8.1 React Router
Recoil	Recoil (recoiljs.org)
Axios	Axios (axios-http.com)
React hook Form	Home React Hook Form - Simple React forms validation (react-hook-form.com)
React Icons	React Icons (react-icons.github.io)
Framer Motion	Documentation Framer for Developers

4.3.2 Web Framework Frontend

These are some of frontend web frameworks.

React	React – A JavaScript library for building user interfaces (reactjs.org)
Vue	Vue.js - The Progressive JavaScript Framework Vue.js (vuejs.org)
Angular	Angular
Svelte	Svelte • Cybernetically enhanced web apps
Qwik	Framework reimaged for the edge! - Qwik (builder.io)

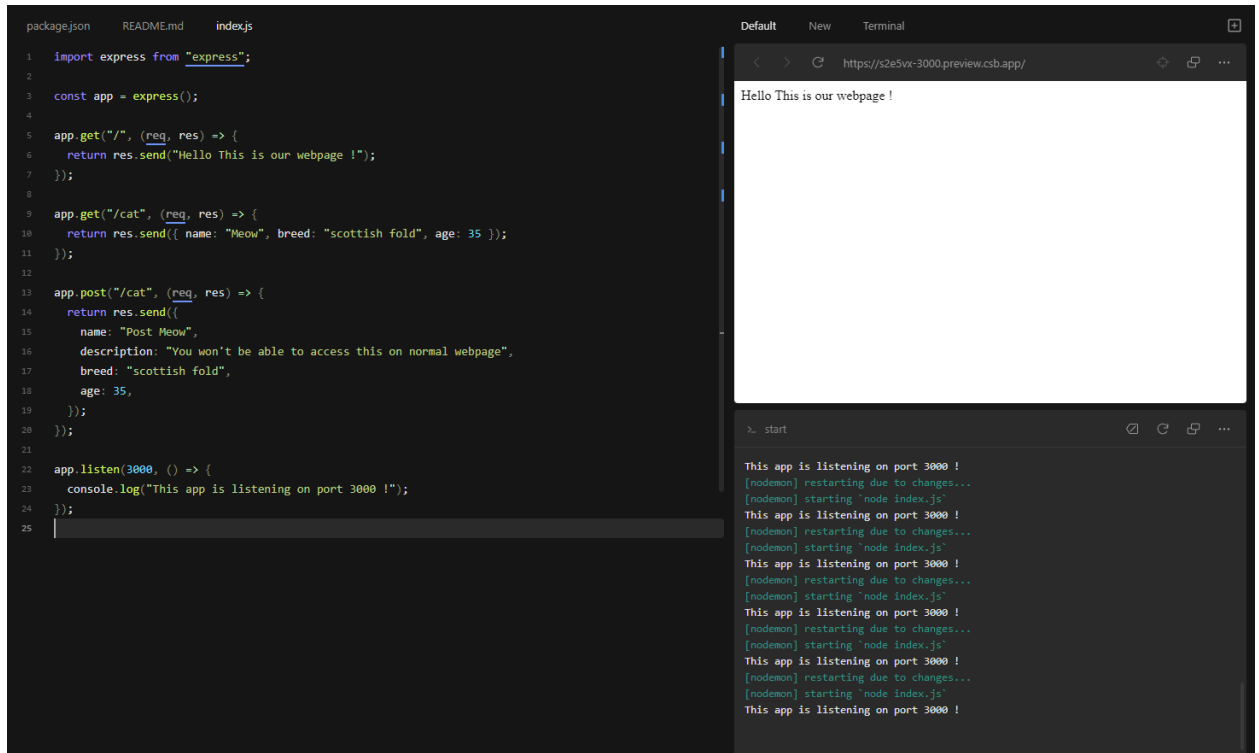
SolidJs	SolidJS · Reactive Javascript Library
Astro	Astro Build faster websites

4.4 Backend

Here is some Framework that you are going to learn in the next session.

Nodejs	<p>Node.js is a JavaScript runtime built on Chrome's V8 JavaScript engine.</p> <p>Basically, The thing that make your Javascript can be run outside browser just like Java or python.</p>	Node.js (nodejs.org)
Mongoose	<p>Express is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications.</p> <p>Basically, A library for nodejs to provide simpler server development in nodejs.</p>	Mongoose ODM v6.10.0 (mongoosejs.com)
Express	<p>Mongoose is a JavaScript object-oriented programming library that creates a connection between MongoDB and the Node.js JavaScript runtime environment</p>	Express - Node.js web application framework (expressjs.com)

4.4.1 Example of backend



<https://codesandbox.io/p/sandbox/eloquent-frost-s2e5vx>

You can try these commands to send requests to your backend.

curl http://localhost:3000	Send get request to the / route
curl -X POST http://localhost:3000/cat	Send post request to the /cat route
curl http://localhost:3000/cat	Send get request to the /cat route
curl -I http://localhost:3000	See the header of / route
curl -I http://localhost:3000/cat	See the header of /cat route

Look outside Javascript.

5.1 Frontend without javascript

Some url for you to read.

Flutter	Flutter use Dart instead of HTML,CSS and Javascript. If you write your web application in Flutter, you can convert it into Mobile Application or a computer program !.	Flutter - Build apps for any screen
Webassembly	Web assembly allows you to run binary instruction in web browser ! you can write an application in Rust, Python or Go then run it (almost) natively in browser.	WebAssembly
Sycamore	Sycamore is a library in Rust that let you write webAssembly instead of javascript.	Sycamore (sycamore-rs.netlify.app)

5.2 Backend without Javascript

Gin	Gin Web Framework (gin-gonic.com)
Fiber	Fiber (gofiber.io)
Actix	Actix
Phoenix	Phoenix Framework
Django	The web framework for perfectionists with deadlines Django (django project.com)
Ruby on Rails	Ruby on Rails — A web-app framework that includes everything needed to create database-backed web applications according to the Model-View-Controller (MVC) pattern.
Spring Boot	Spring Boot

Practice building a full-stack web application ?

Here are some resource for you

 [How to OVER Engineer a Website // What is a Tech Stack?](#)

[\(4\) MERN Stack Tutorial #1 - What is the MERN Stack? - YouTube](#)

[The MERN stack tutorial - LogRocket Blog](#)