



MSc. Enterprise Software Systems
Module: Enterprise Web Development

Overview

Website: <https://tutors.dev/topic/enterpwebdev-2025-setu-deise/topic00>

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Objective

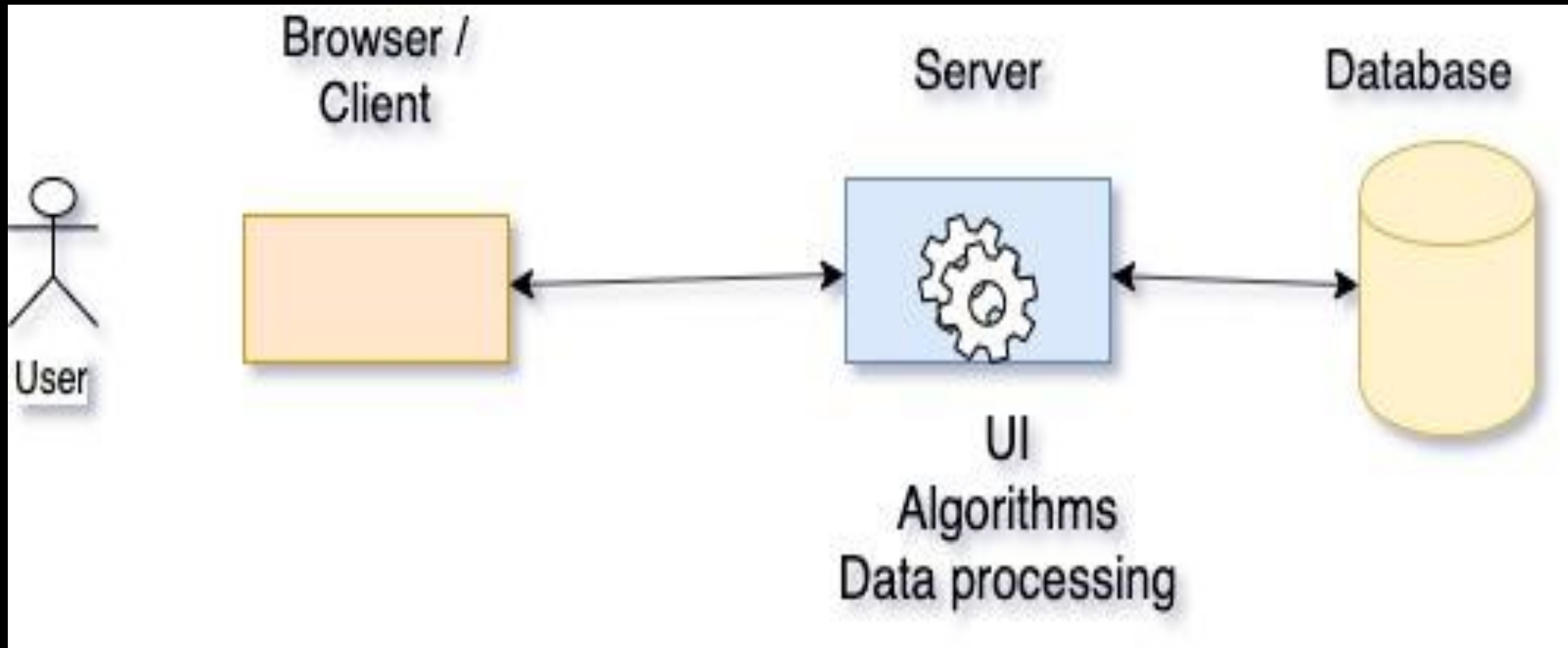
TL;DR

Design and implement client-side rendering web apps and deploy them on a serverless platform using automated provisioning of the required cloud resources.

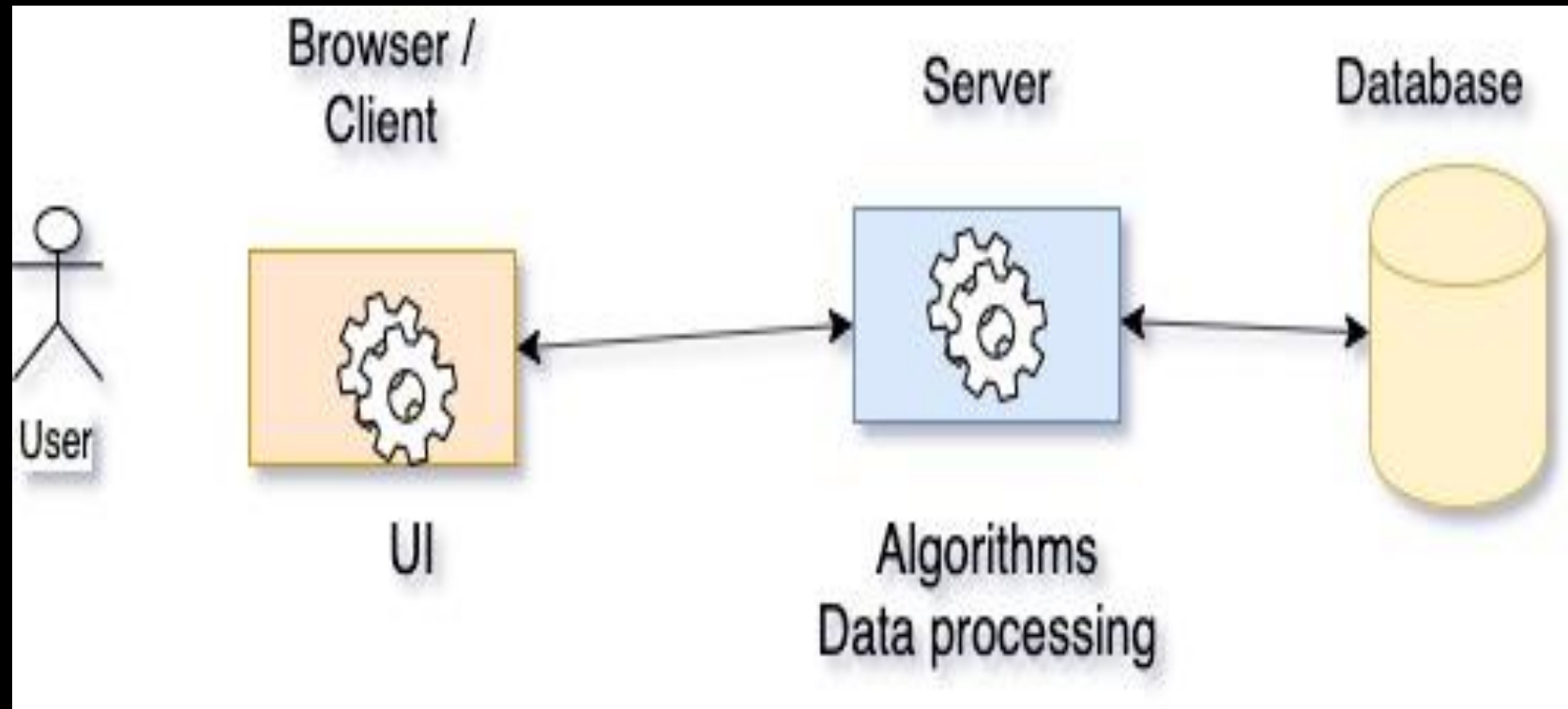
Agenda

- Context.
- This module's focus.
- Software installation requirements.

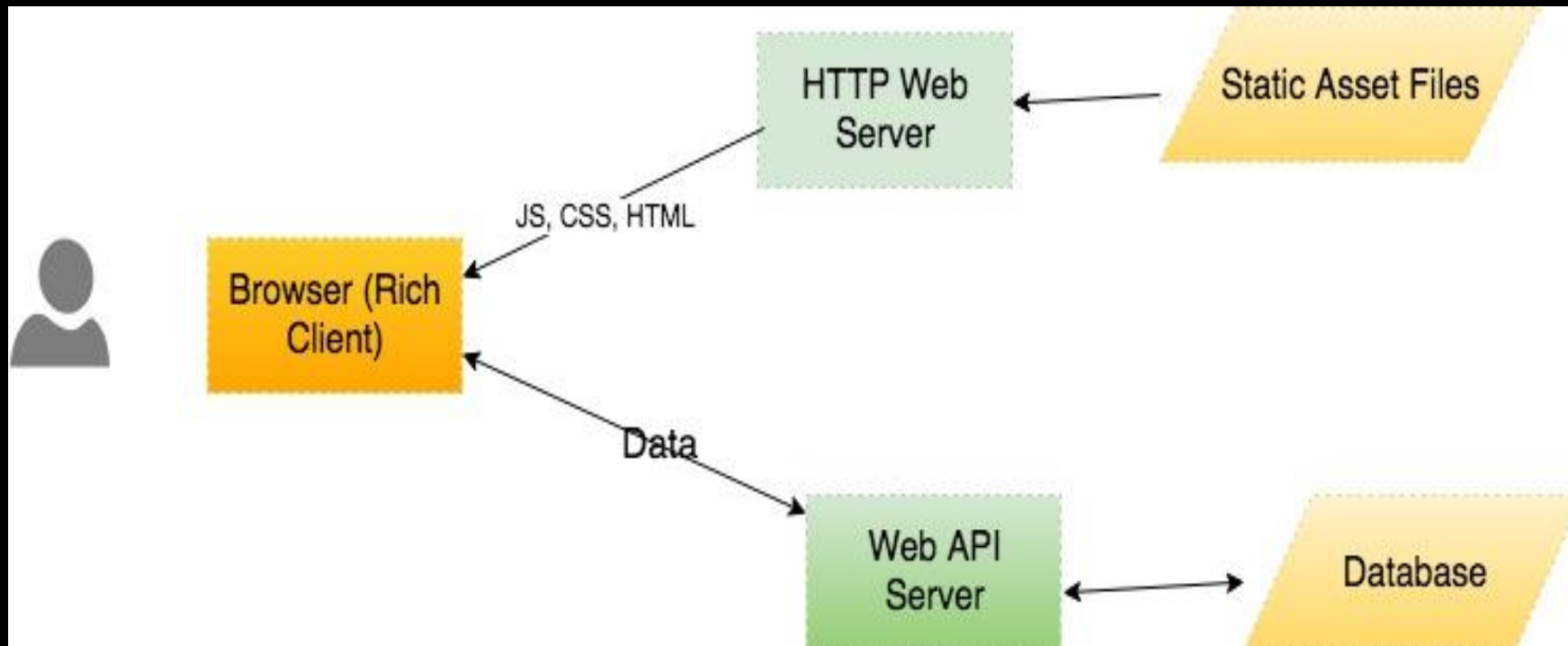
Web Apps Architecture – Server-Side Rendering (SSR)



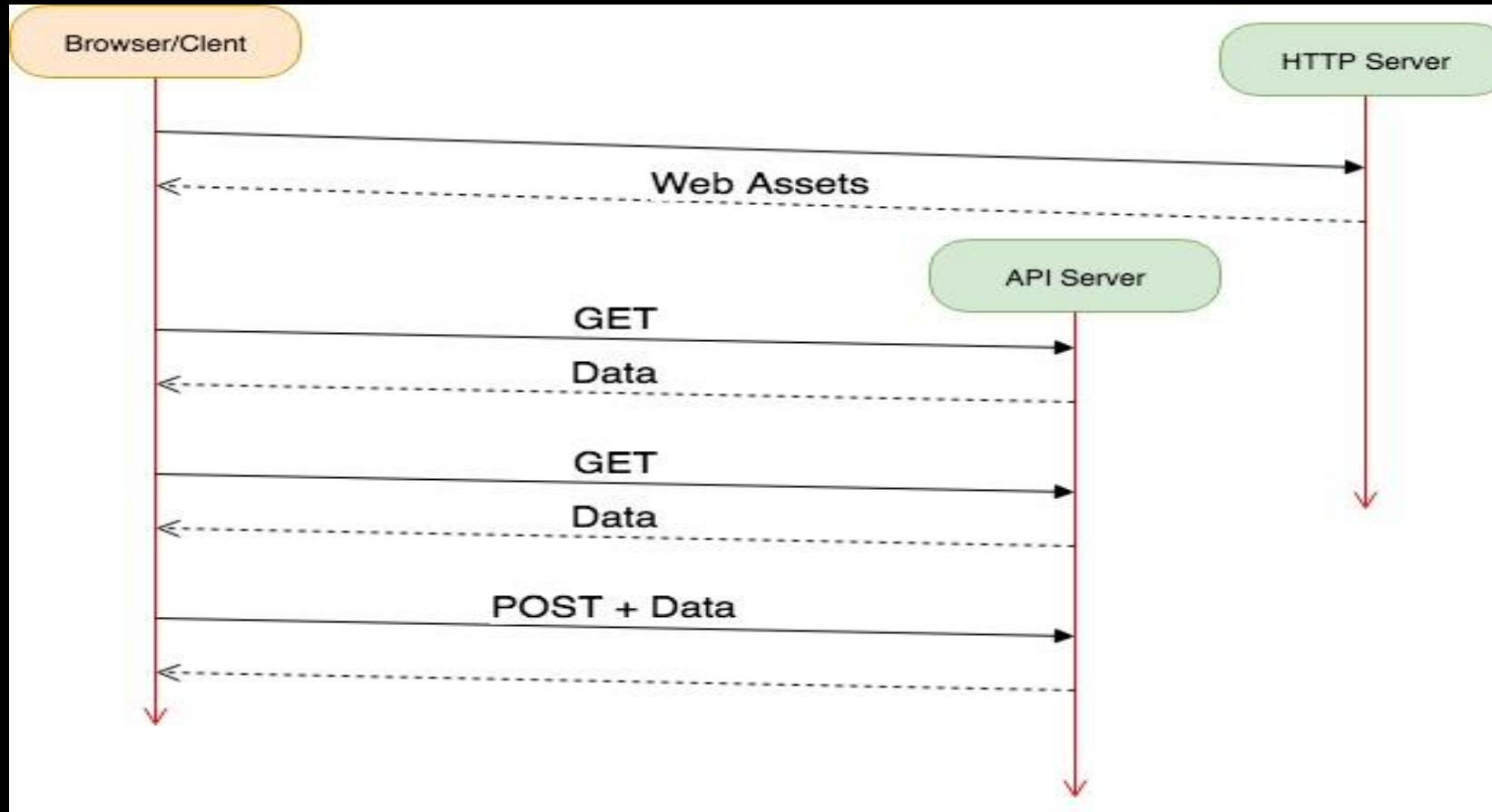
Web Apps Architecture – Client-Side Rendering (CSR)



Client-Side Rendering – Deployment (Traditional)



CSR Web Apps – HTTP Communications flow



CSR Web Apps – Evolution.

- Early Examples: Gmail (2004), YouTube (1st generation)
 - Disadvantage:
 - Poor developer experience (DX) – code bloat; Poor maintainability; Browser inconsistencies.
 - Lacked addressability (Key principle of the web).
- JQuery – A cross-platform JavaScript library to simplify the client-side scripting of HTML pages. (2006)
 - Adv.: Better developer productivity; reduced code bloat.
 - Disadvantages: Lacked Addressability; Unmaintainable code (spaghetti code).
- Single Page App (SPA) frameworks. (2010 ish)
 - Supports addressability; Improved DX; Improved maintainability.

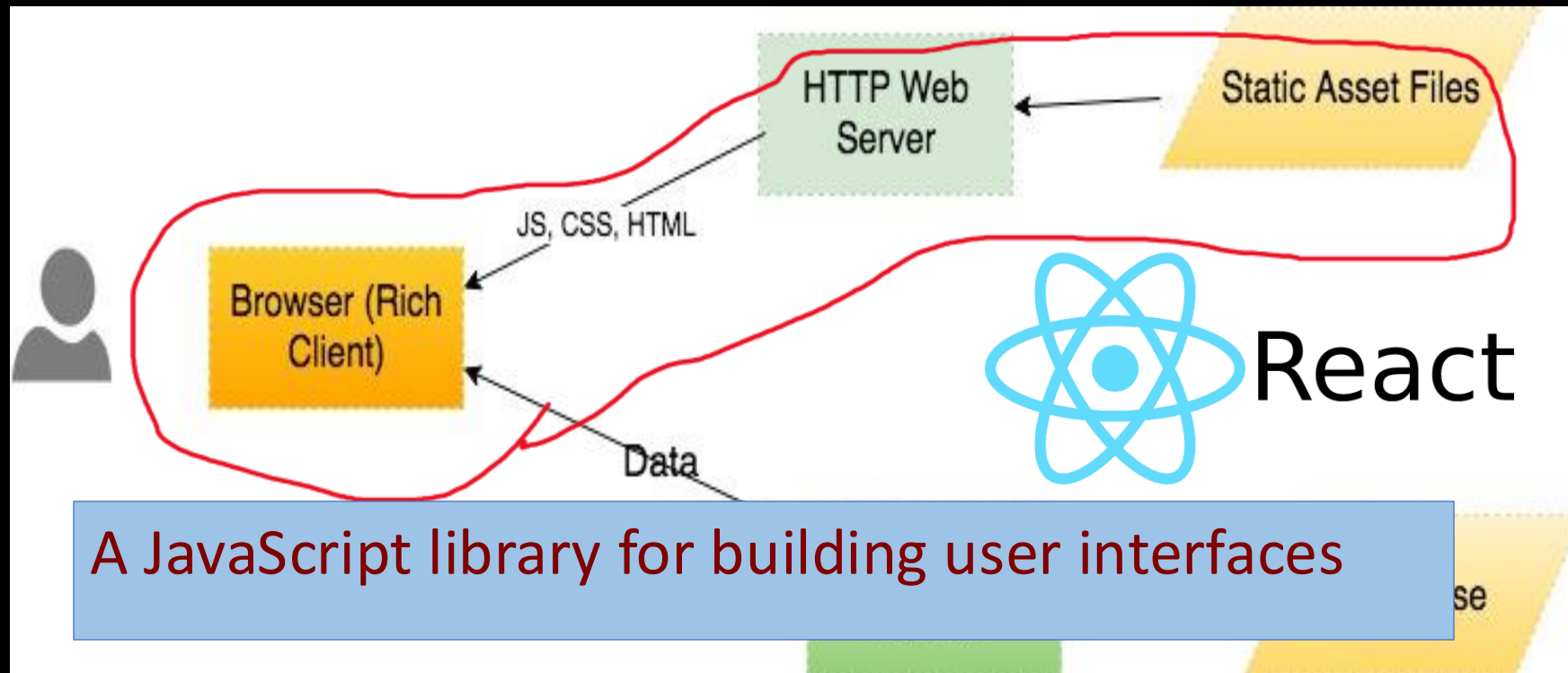
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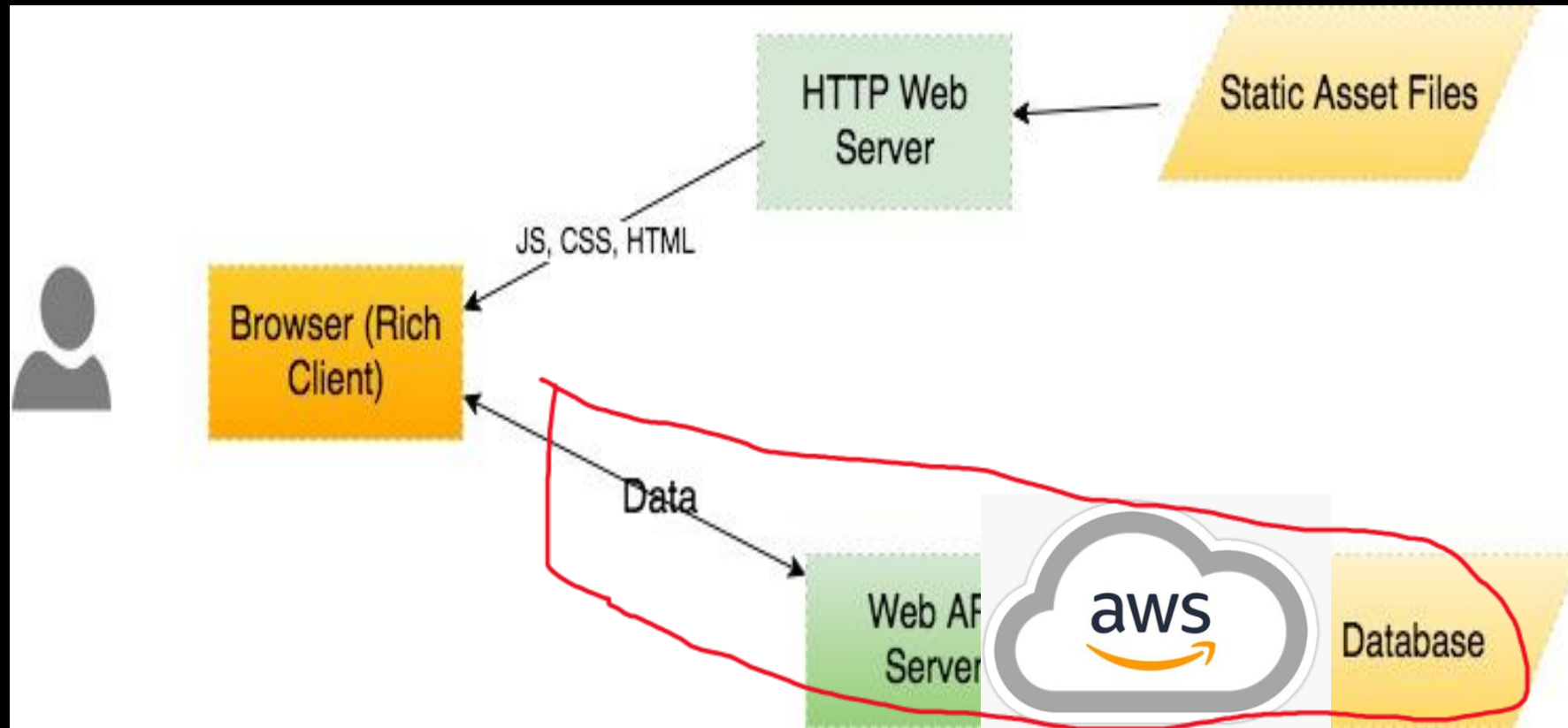
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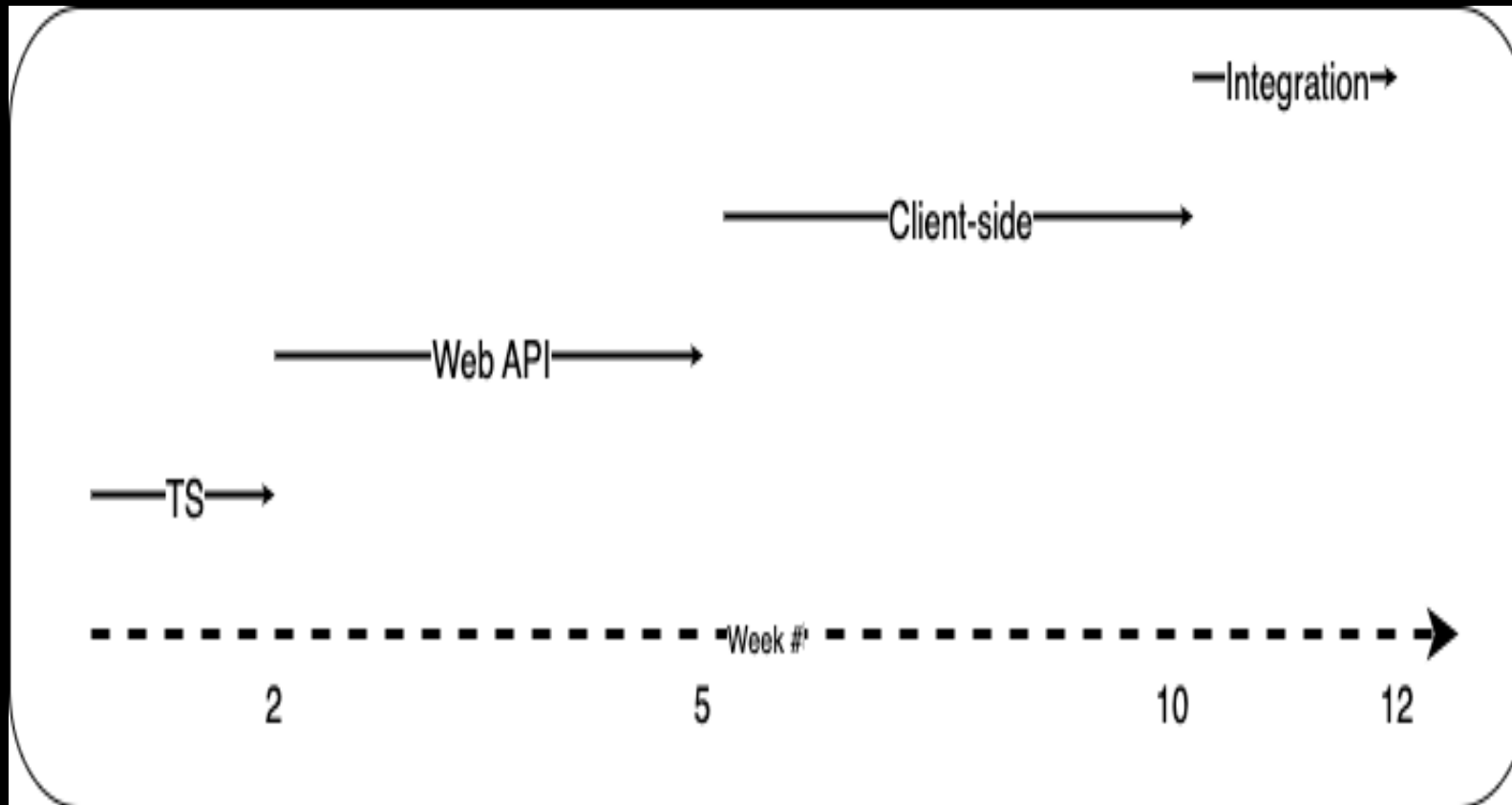
Our Technology stack - Client.



Our Technology stack - Server.



Outline schedule



Agenda

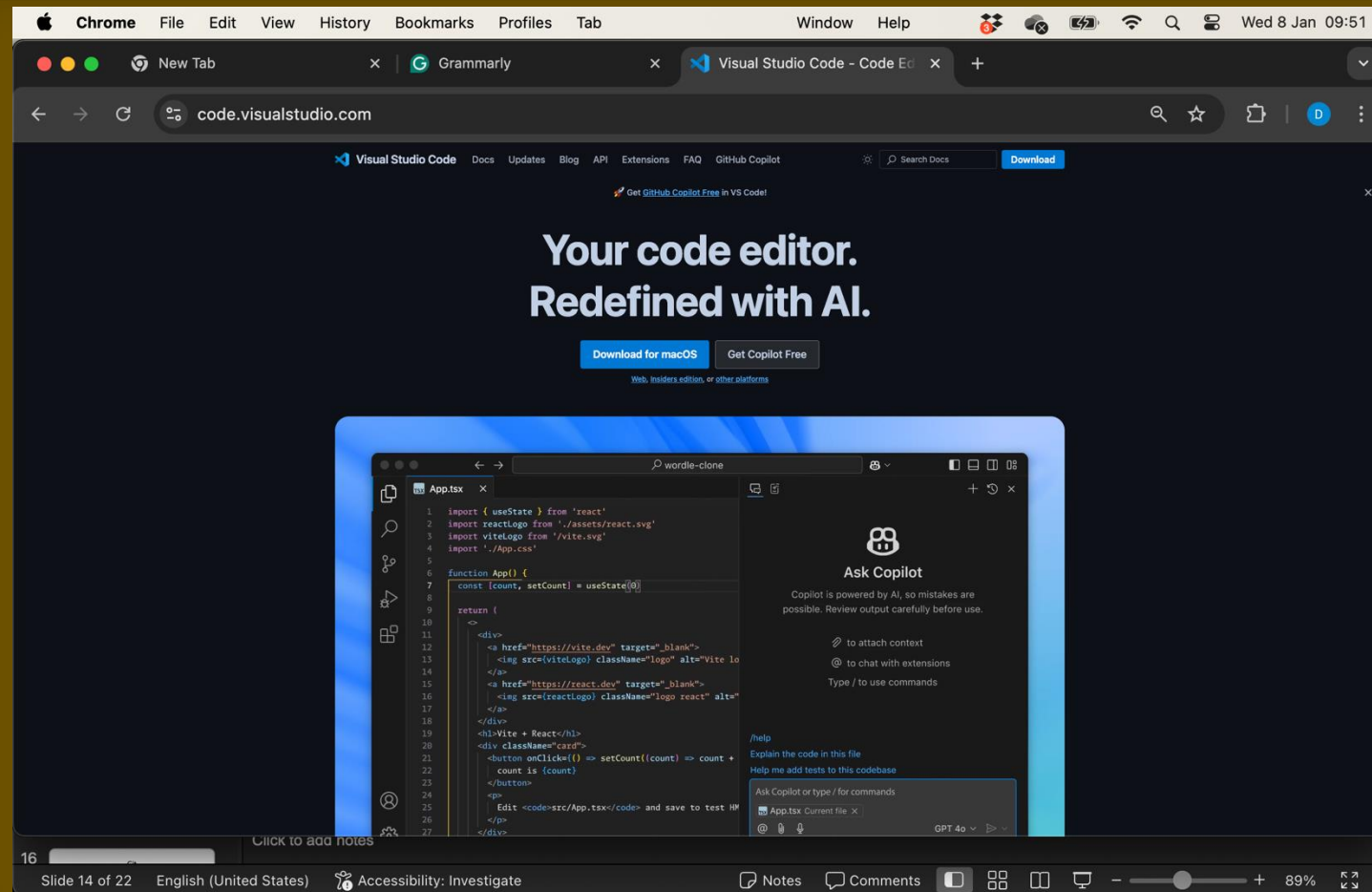
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Text Editor – VS Code

(Not a heavyweight IDE, thankfully)



Node.js

(A JavaScript runtime platform)

nodejs.org/en

nodejs

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Node.js® is a free, open-source, cross-platform JavaScript runtime environment that lets developers create servers, web apps, command line tools and scripts.

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Downloads Node.js **v22.13.0**¹ with long-term support. Node.js can also be installed via [package managers](#).

Want new features sooner? Get **Node.js v23.6.0**¹ instead.

Create an HTTP Server

```
1 // server.mjs
2 import { createServer } from 'node:http';
3
4 const server = createServer((req, res) => {
5   res.writeHead(200, { 'Content-Type': 'text/'
6   res.end('Hello World!\n');
7 });
8
9 // starts a simple http server locally on port 3000
10 server.listen(3000, '127.0.0.1', () => {
11   console.log('Listening on 127.0.0.1:3000');
12 });
13
14 // run with `node server.mjs`
```

JavaScript [Copy to clipboard](#)

Learn more what Node.js is able to offer with our [Learning materials](#).

Slide 16 of 16 English (United States) Accessibility: Investigate

Notes Comments 71%

Source Control - Git

The screenshot shows the Git website in a Chrome browser. The browser's address bar displays "Secure | https://git-scm.com". The website features the Git logo and the tagline "--distributed-even-if-your-workflow-isnt". A search bar is located in the top right corner. The main content area describes Git as a "free and open source distributed version control system" and lists its features, including "easy to learn", "tiny footprint with lightning fast performance", "cheap local branching", "convenient staging areas", and "multiple workflows". A "Try Git" button is prominently displayed. To the right, a diagram illustrates a distributed version control system with multiple repositories connected by a network. The footer contains links for "About", "Documentation", and "Latest source Release 2.15.1". A code editor window is visible at the bottom, showing a snippet of code:

```
console.log(acar.owner + " drives a " + acar.type.make);
```

Chrome File Edit View History Bookmarks People Window Help

Git x

Secure | https://git-scm.com

git --distributed-even-if-your-workflow-isnt

Search entire site...

Git is a **free and open source** distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Git is **easy to learn** and has a **tiny footprint with lightning fast performance**. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like **cheap local branching**, convenient **staging areas**, and **multiple workflows**.

Learn Git in your browser for free with Try Git.

About
The advantages of Git compared to other source control systems

Documentation
Command reference pages, Pro Git book content, videos and more

Latest source Release 2.15.1

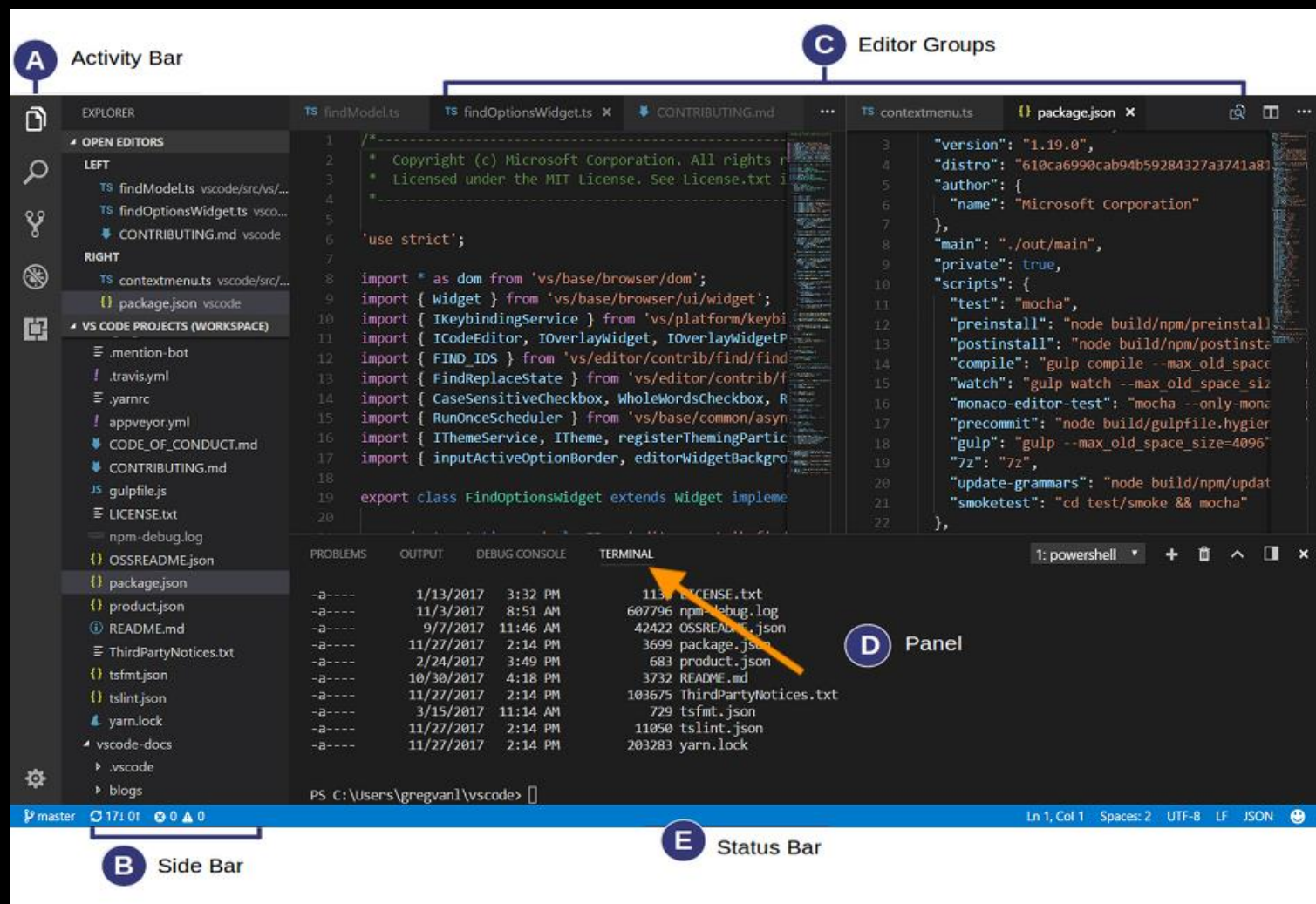
Line 33, Column 76

```
console.log(acar.owner + " drives a " + acar.type.make);
```

35 misspelled words Spaces: 4 Markdown

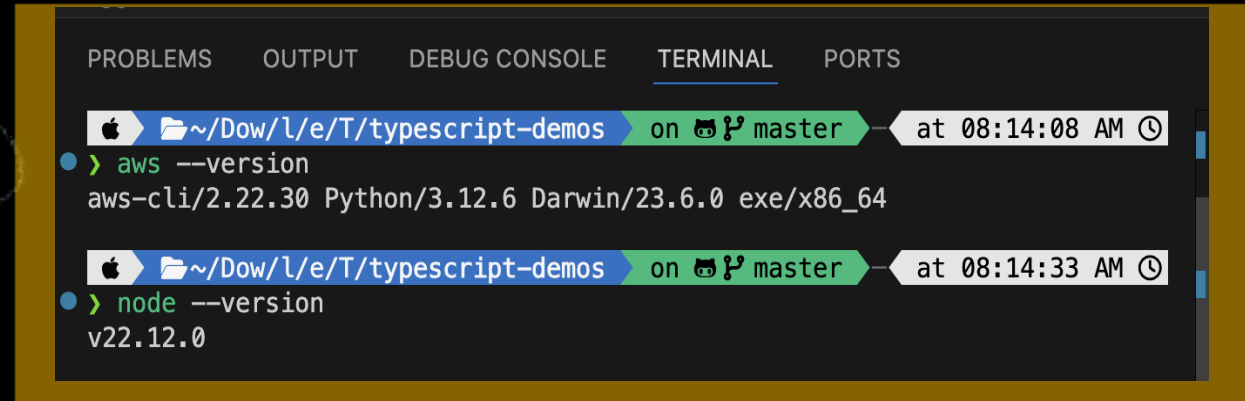
Terminal/Shell

(Use VS Code's integrated terminal)



Prerequisites.

- An AWS account.
- The AWS CLI installed
- Familiarity with AWS Management Console

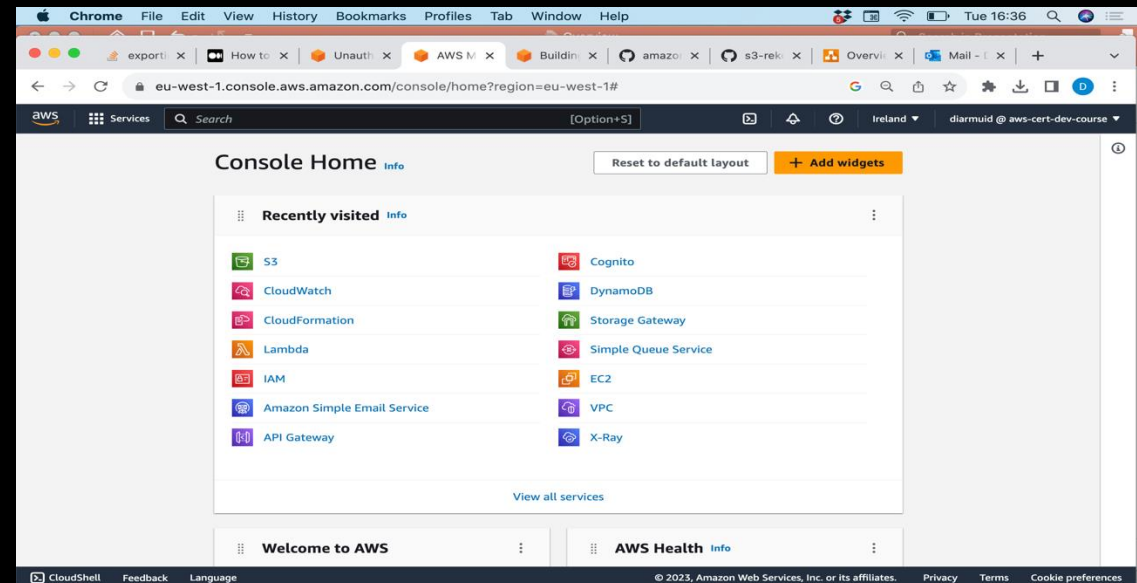


A screenshot of a terminal window with a dark background. The terminal shows two commands being executed in a shell. The first command is `aws --version`, which outputs `aws-cli/2.22.30 Python/3.12.6 Darwin/23.6.0 exe/x86_64`. The second command is `node --version`, which outputs `v22.12.0`. The terminal interface includes tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL (which is active), and PORTS. The prompt indicates the user is in the directory `~/Dow/l/e/T/typescript-demos` on a `master` branch.

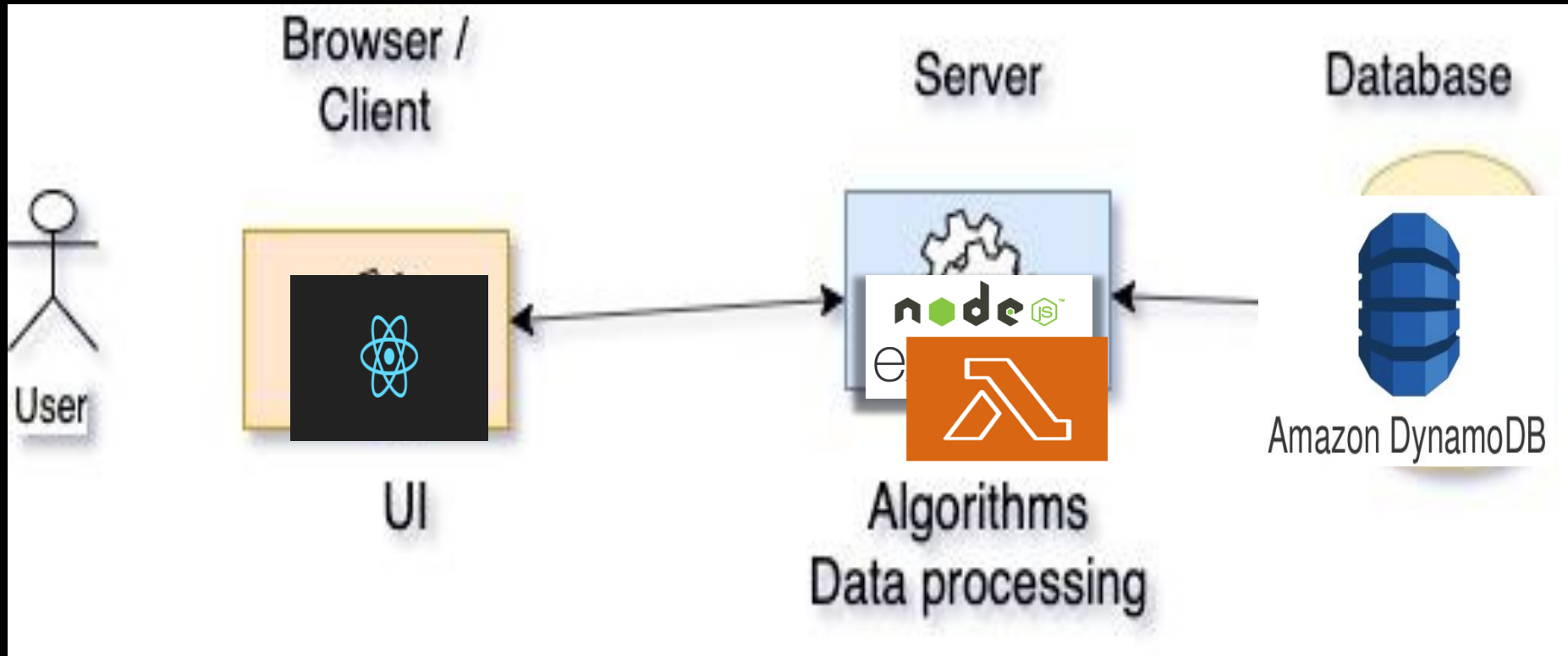
```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

~/Dow/l/e/T/typescript-demos on master at 08:14:08 AM
> aws --version
aws-cli/2.22.30 Python/3.12.6 Darwin/23.6.0 exe/x86_64

~/Dow/l/e/T/typescript-demos on master at 08:14:33 AM
> node --version
v22.12.0
```



(Serverless) Full-Stack Web Development



Summary

- Two models of web apps:
 - Server Side Rendering (SSR)
 - Client Side Rendering (CSR)
- CSR model evolution:
 - Unmaintainable JS codebase to SPA framework-based.
 - No addressability to full addressable.
- Server-side evolution:
 - From SSR web applications to Web APIs.
- NoSQL databases.