



MSc. Computer Science (ESS)
Module: Enterprise Web Development

Overview

Website: <https://tutors.dev/topic/enterpwebdev-2026-setu-deise/topic00>

Diarmuid O Connor (doconnor@wit.ie)

Dr. Frank Walsh (fwwalsh@wit.ie)

Objective

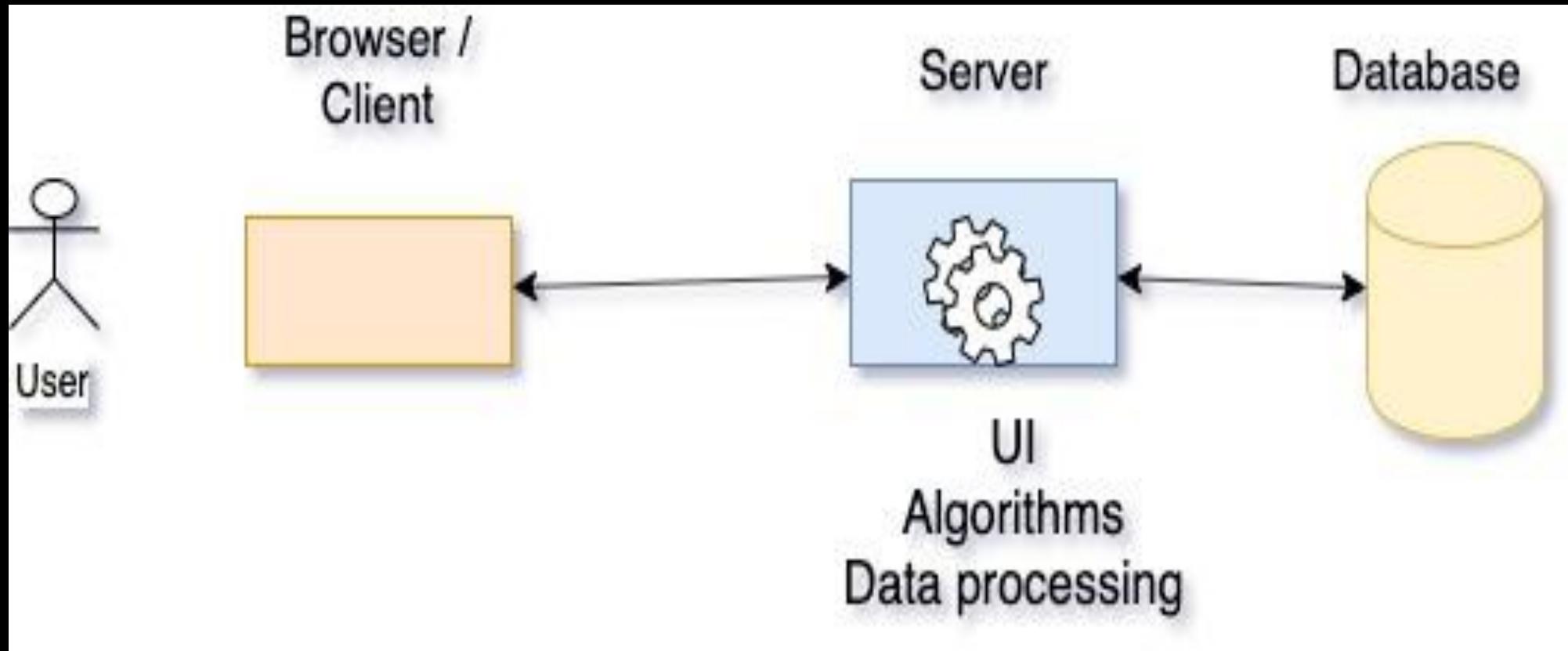
TL;DR

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

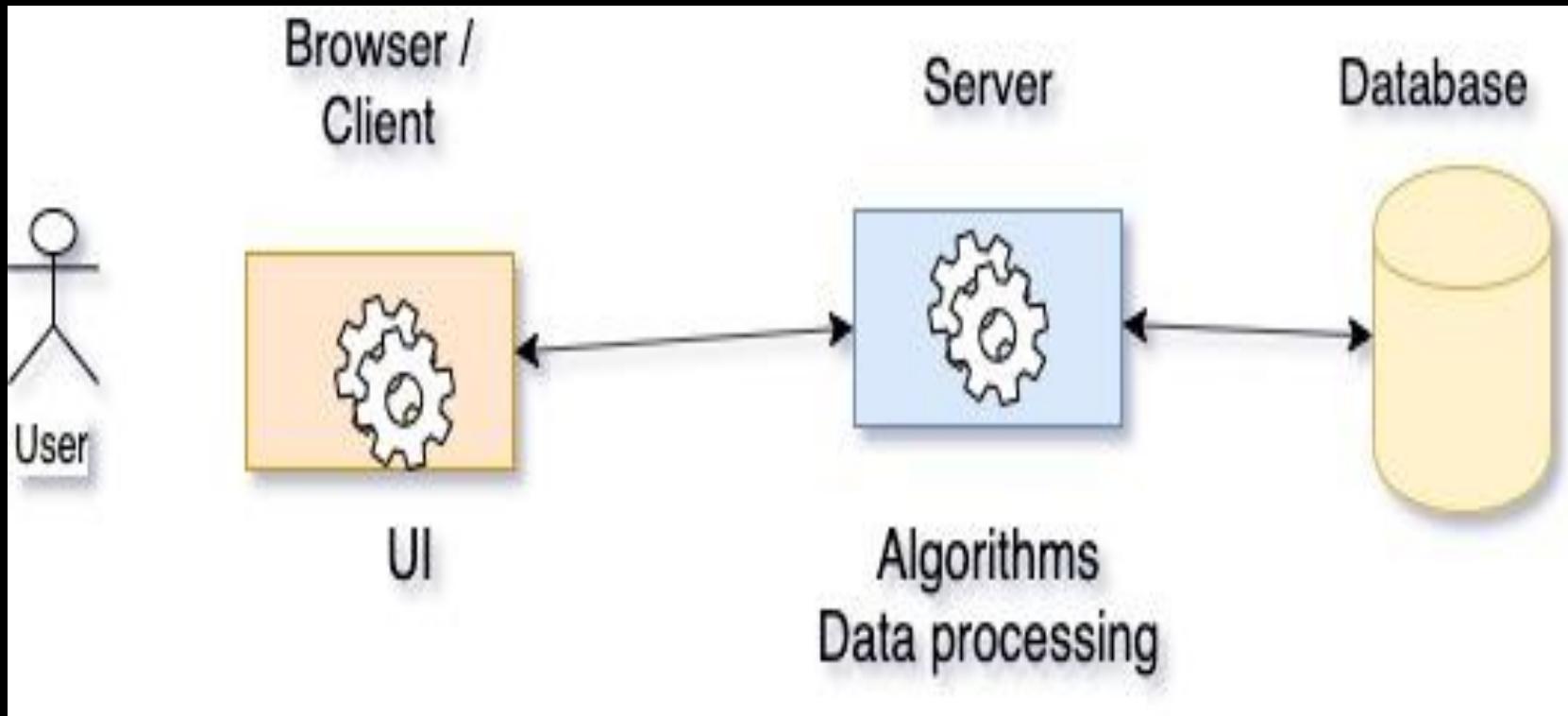
Agenda

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

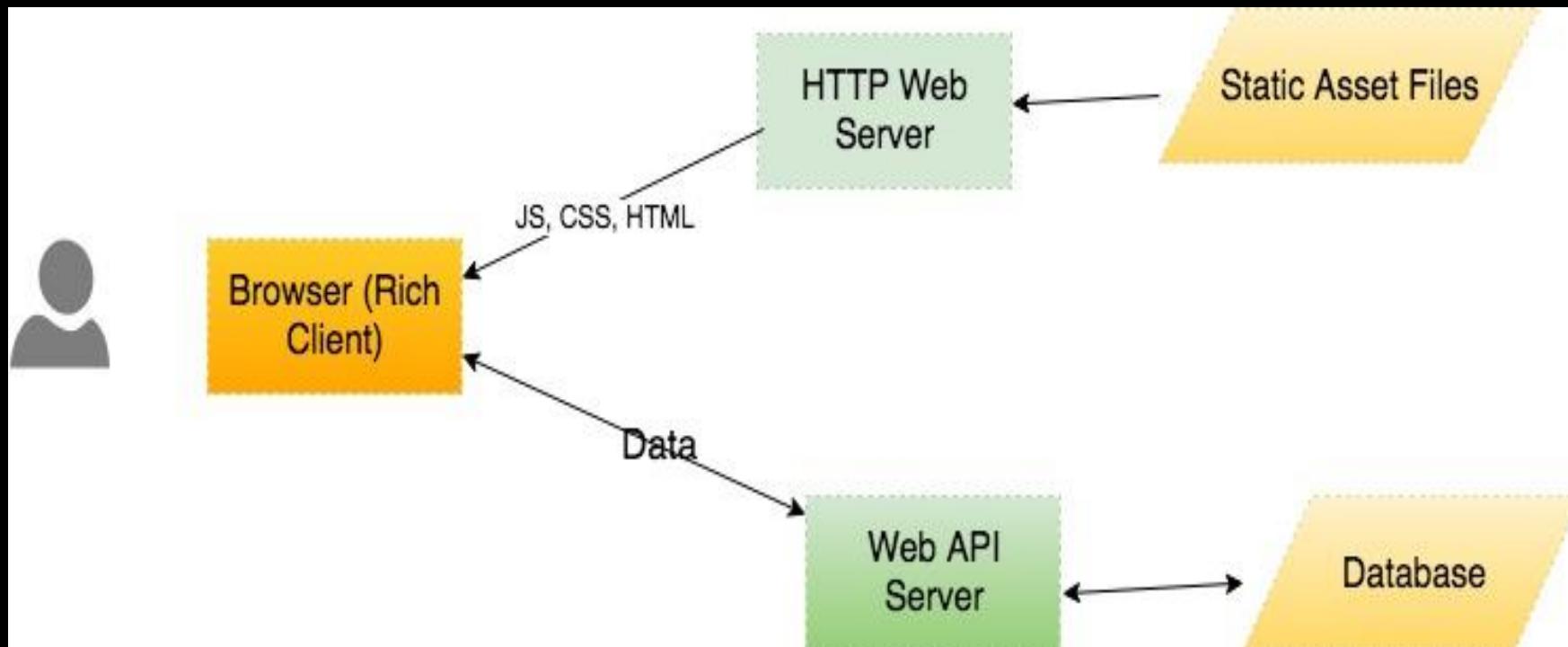
Web Apps Architecture – Server-Side Rendering (SSR)



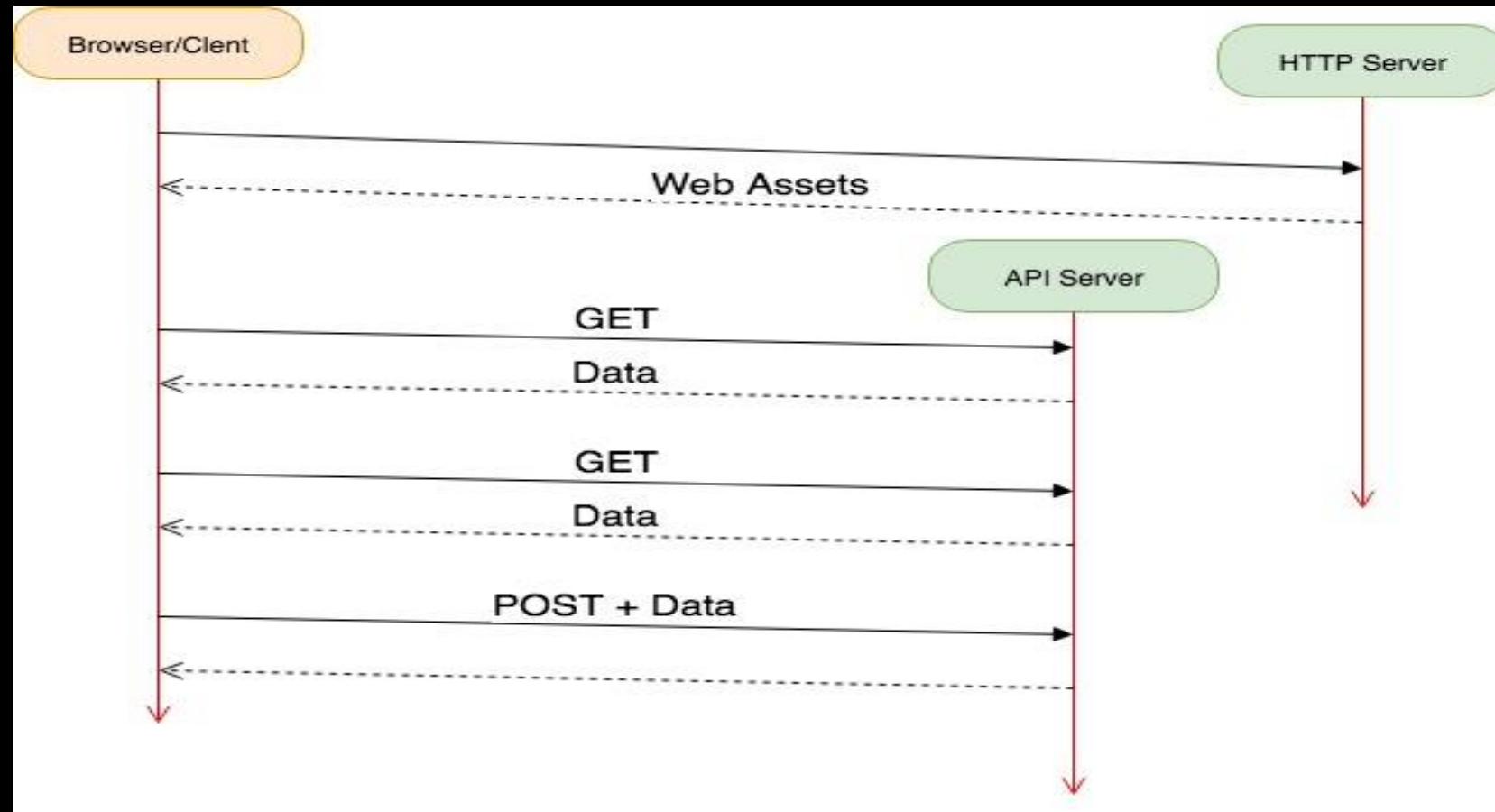
Web Apps Architecture – Client-Side Rendering (CSR)



Client-Side Rendering – Deployment (Traditional)



CSR Web Apps – HTTP Communications flow



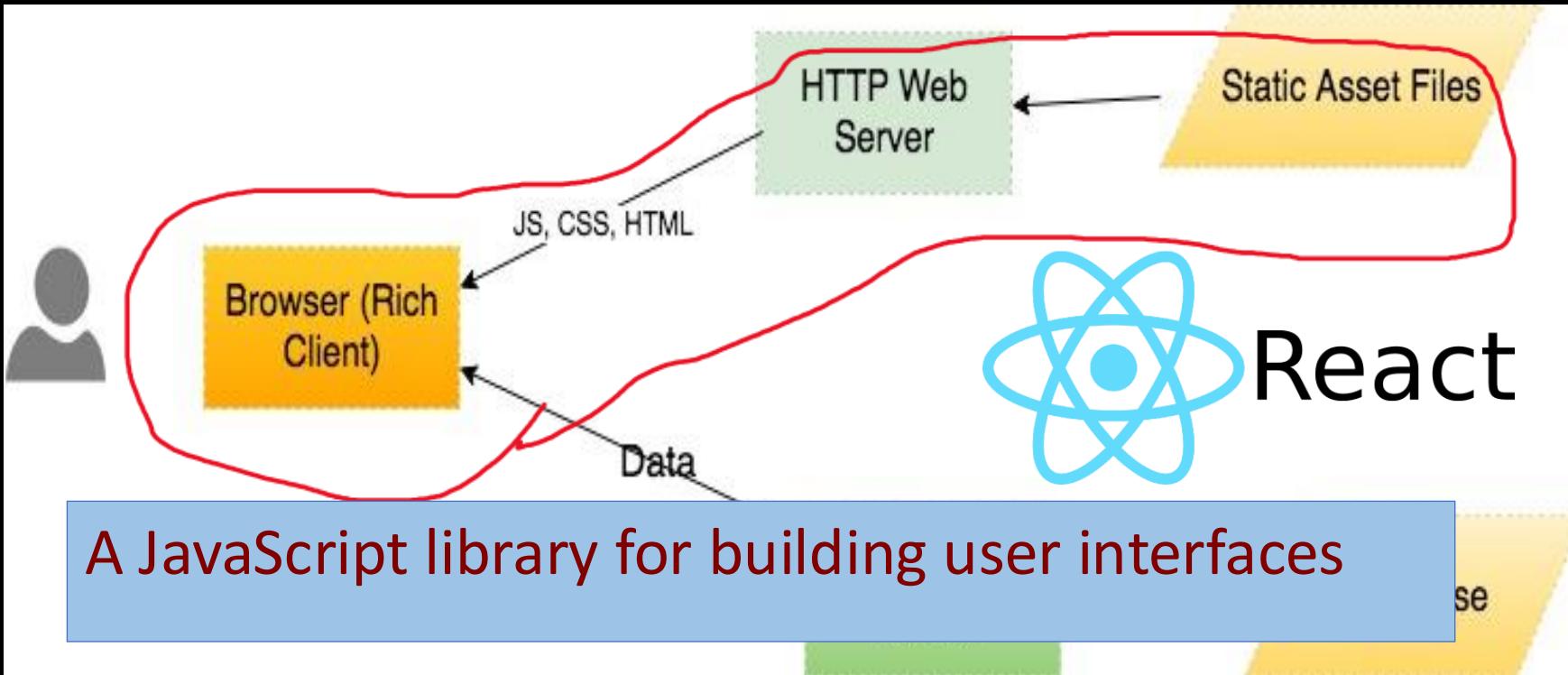
CSR Web Apps – Evolution.

- 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.

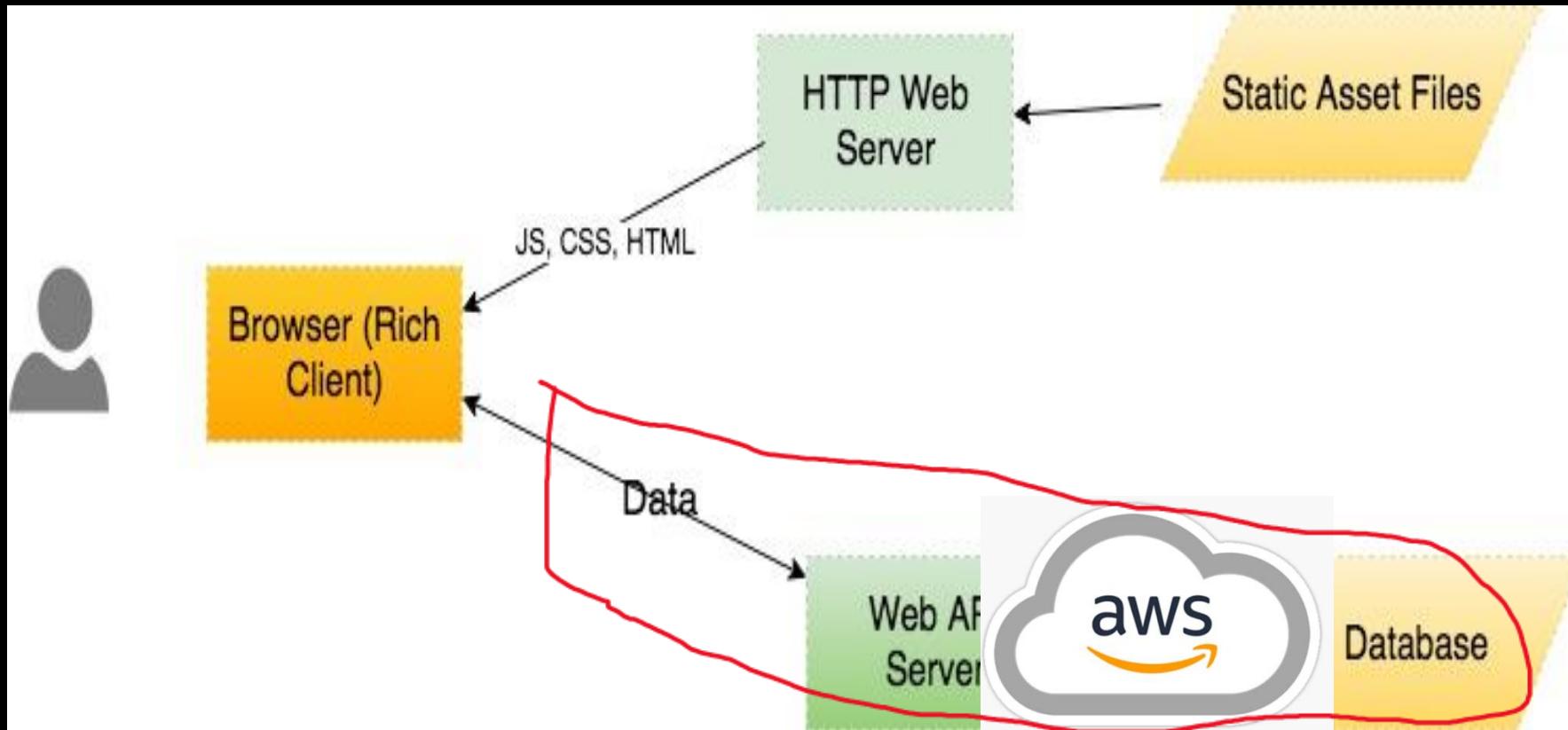
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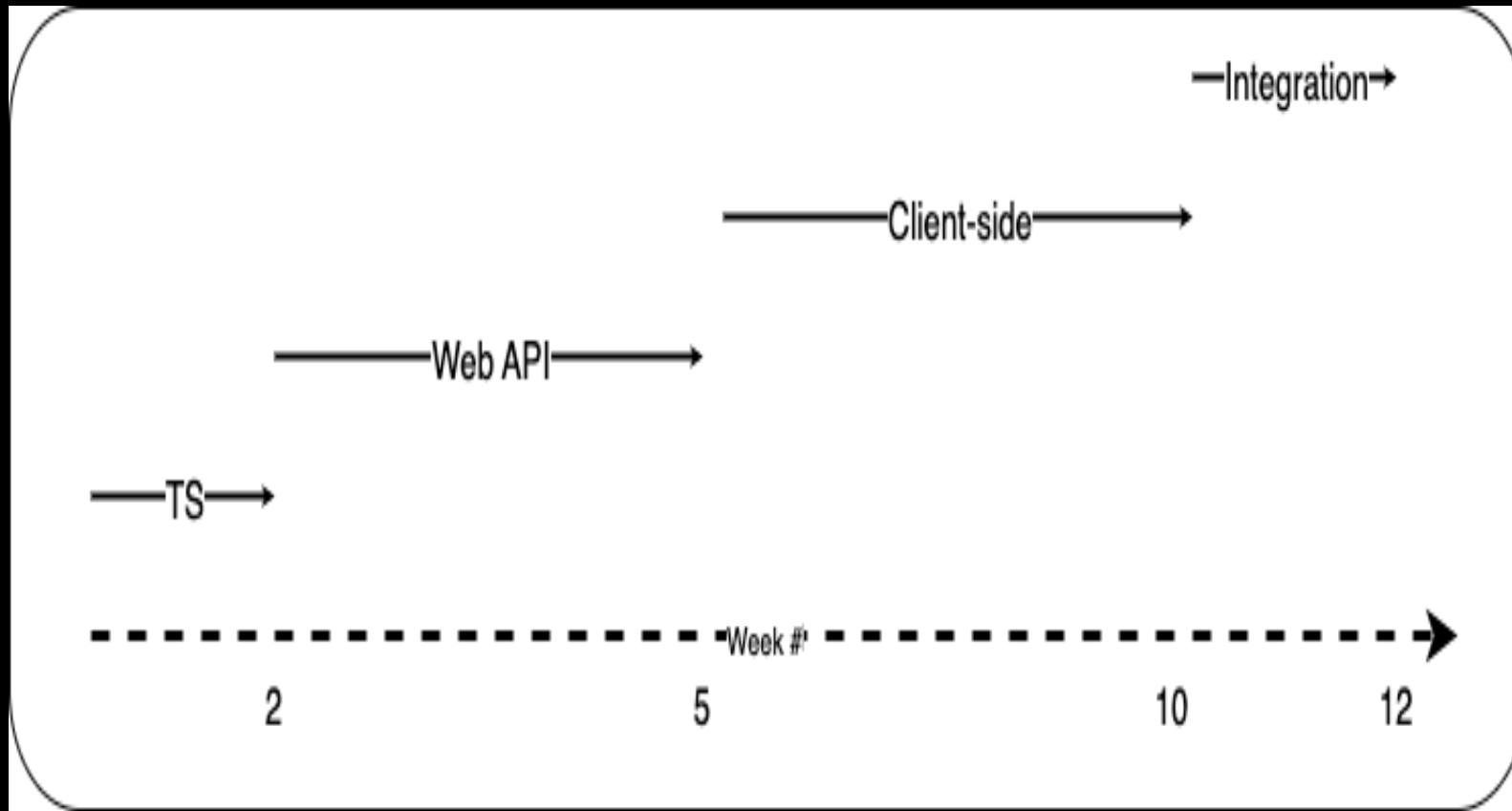
Our Technology stack - Client.



Our Technology stack - Server.



Outline schedule

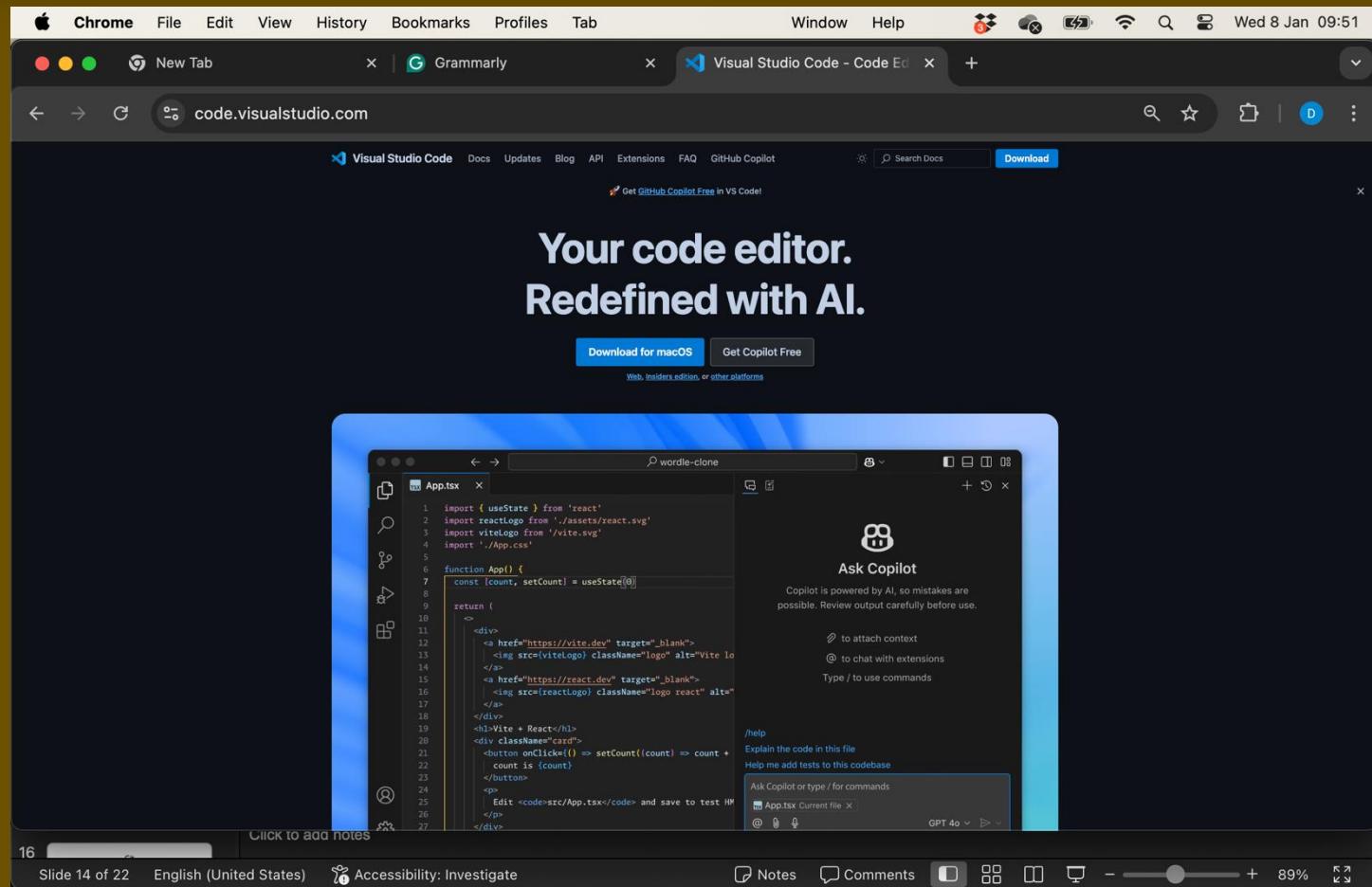


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Text Editor – VS Code

(Not a heavyweight IDE, thankfully)



Node.js

(A JavaScript runtime platform)

The screenshot shows a web browser window with the Node.js homepage loaded. The browser's address bar displays 'nodejs.org/en'. The main content area features a large heading 'Run JavaScript Everywhere' and a brief description of what Node.js is. Below this, there's a 'Download Node.js (LTS)' button and some additional text about installing Node.js. On the right side of the page, there's a code editor-like panel showing a snippet of JavaScript code for creating an HTTP server. The code is as follows:

```
1 // server.mjs
2 import { createServer } from 'node:http';
3
4 const server = createServer((req, res) => {
5   res.writeHead(200, { 'Content-Type': 'text/plain' });
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'
```

The code is labeled 'JavaScript' and has a 'Copy to clipboard' button. At the bottom of the page, there's a link to 'Learning materials'.

Source Control - Git

The screenshot shows the official Git website (<https://git-scm.com>) displayed in a Chrome browser on a Mac OS X system. The page features a large 'git' logo with the tagline '--distributed-even-if-your-workflow-isnt'. Below the logo, two sections of text describe Git's benefits: it's a free and open source distributed version control system designed for efficiency, and it's easy to learn with fast performance. To the right, there's a diagram illustrating the distributed nature of Git, showing multiple repositories connected by bidirectional arrows. A 'try Git' button is visible. At the bottom, there are links for 'About', 'Documentation', and 'Latest source Release 2.15.1'. The status bar at the bottom of the browser window shows 'Line 33, Column 76'.

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

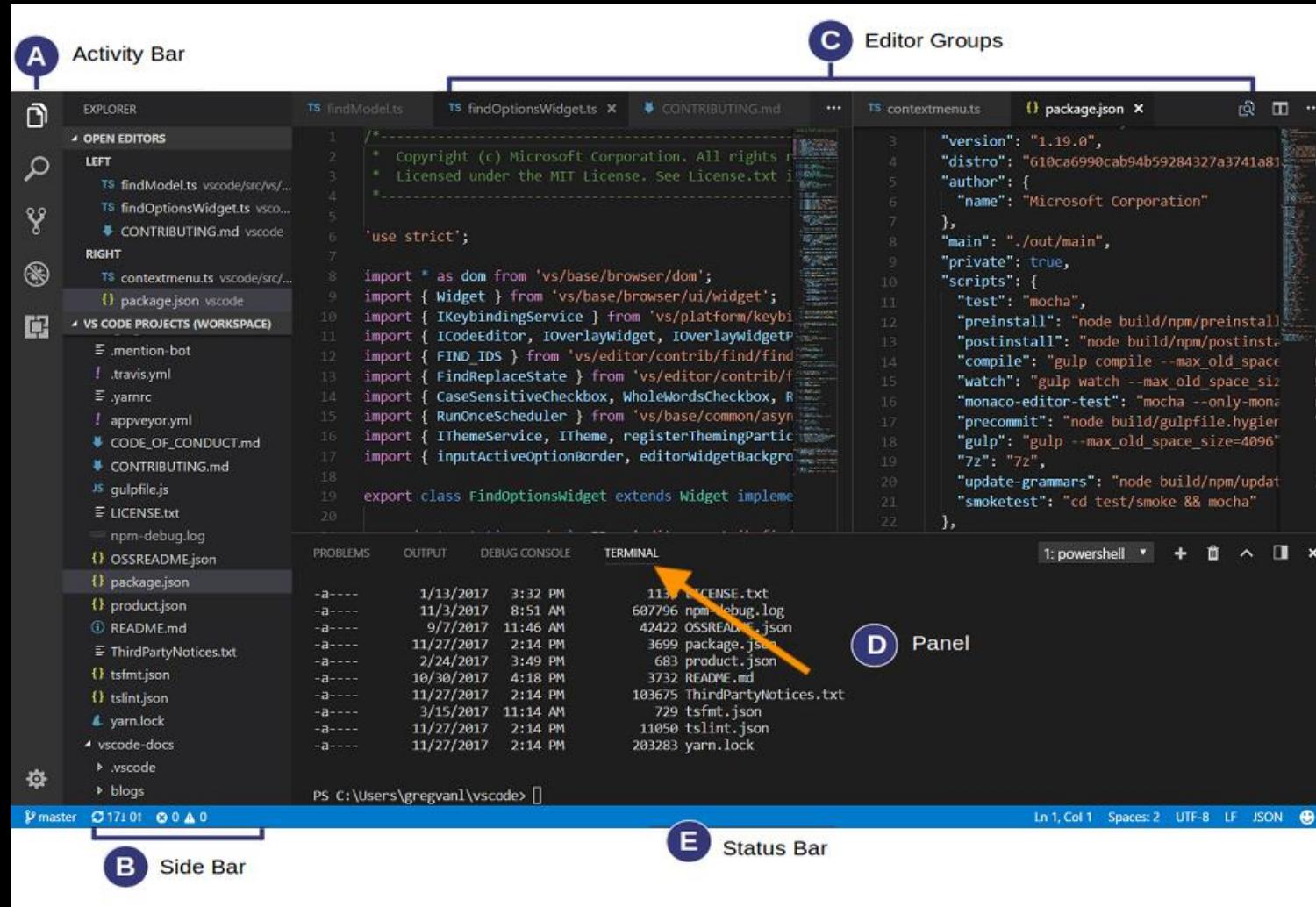
GUI clients and binary releases for all major platforms.

Get involved! Bug reporting, mailing list, chat, development and more

35 misspelled words Spaces: 4 Markdown

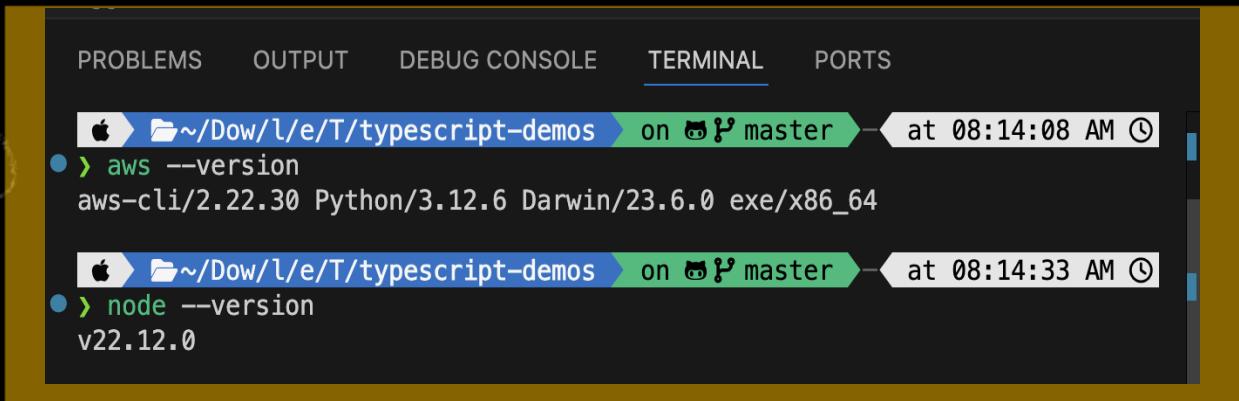
Terminal/Shell

(Use VS Code's integrated terminal)



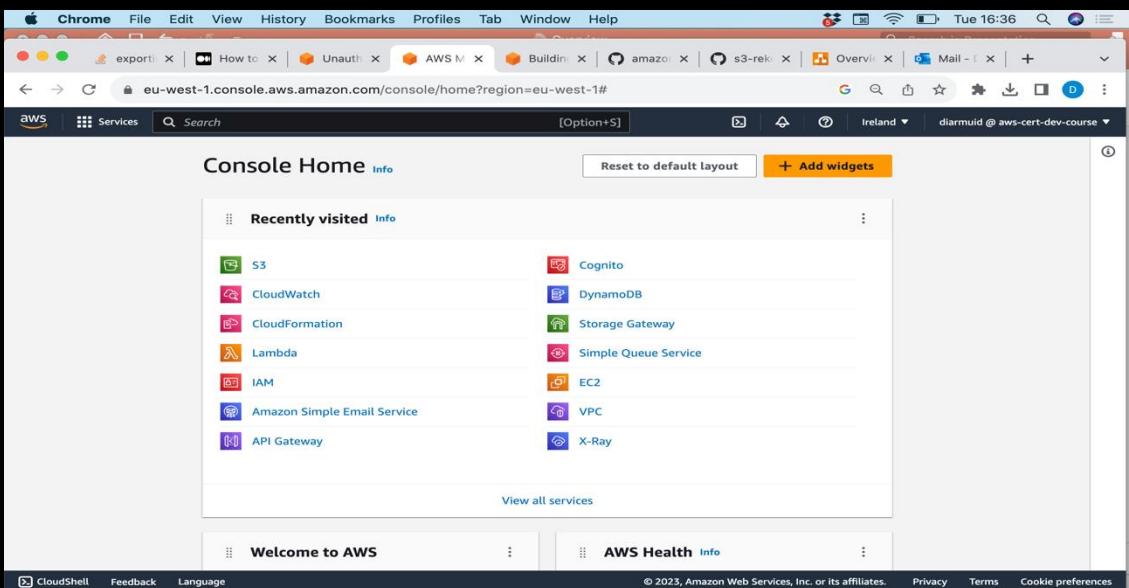
Prerequisites.

- An AWS account.
 - (Paid tier)
- The AWS CLI installed
- Familiarity with AWS Management Console

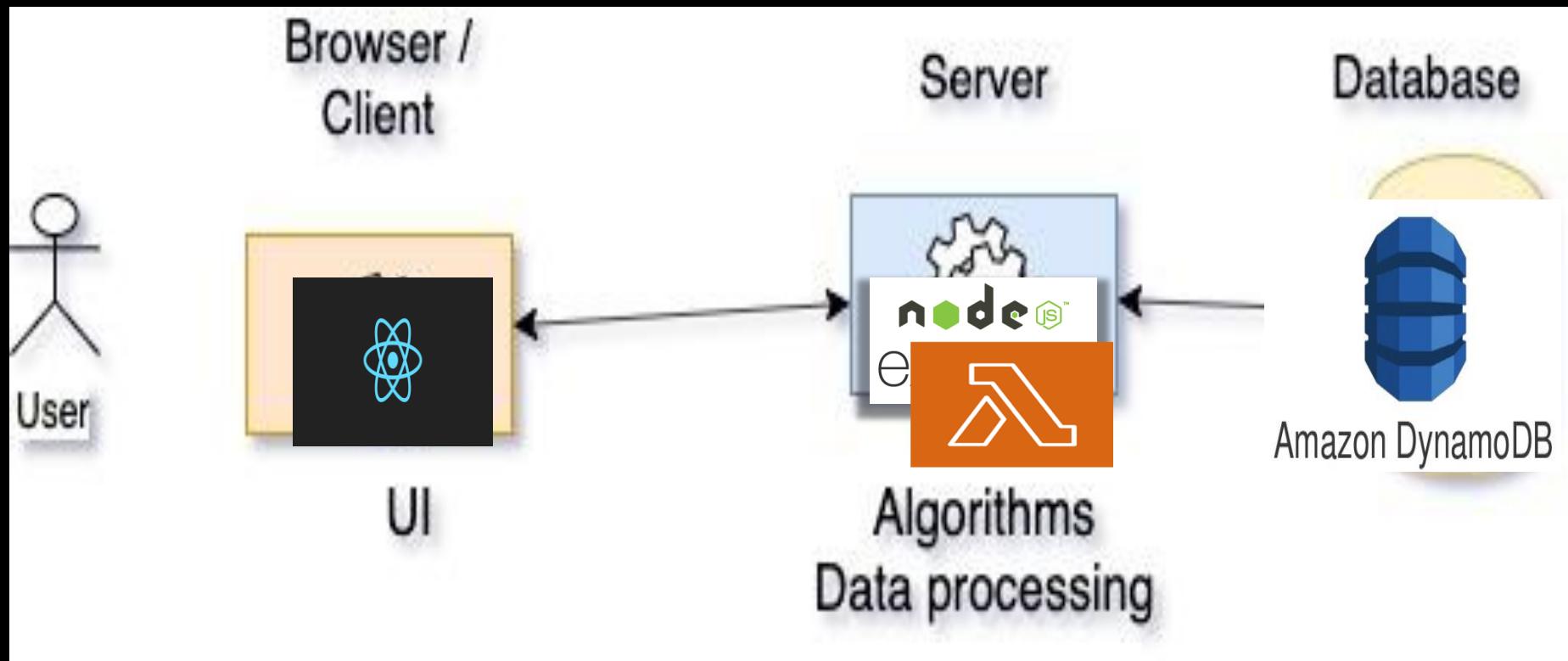


A screenshot of a terminal window with a yellow border. The window has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL (which is selected), and PORTS. It shows two command-line sessions:

```
PROBLEMS      OUTPUT      DEBUG CONSOLE      TERMINAL      PORTS
aws --version
aws-cli/2.22.30 Python/3.12.6 Darwin/23.6.0 exe/x86_64
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.