



01 Introduction to Full Stack development

Prepared by Surajai Chamroensat

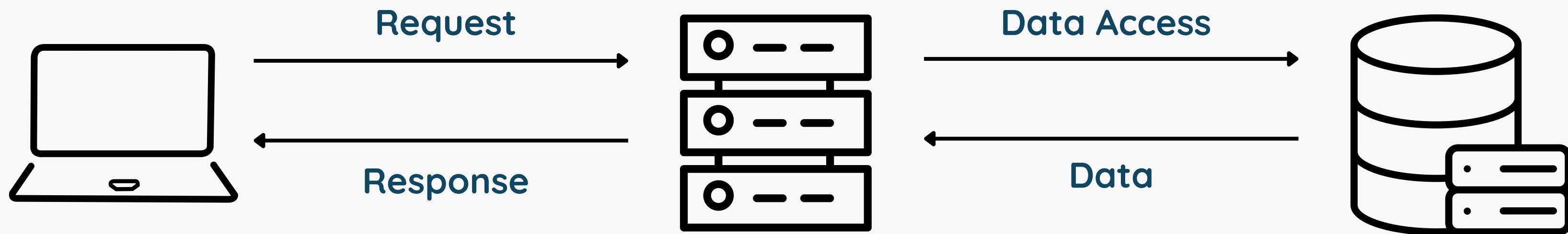


Agenda

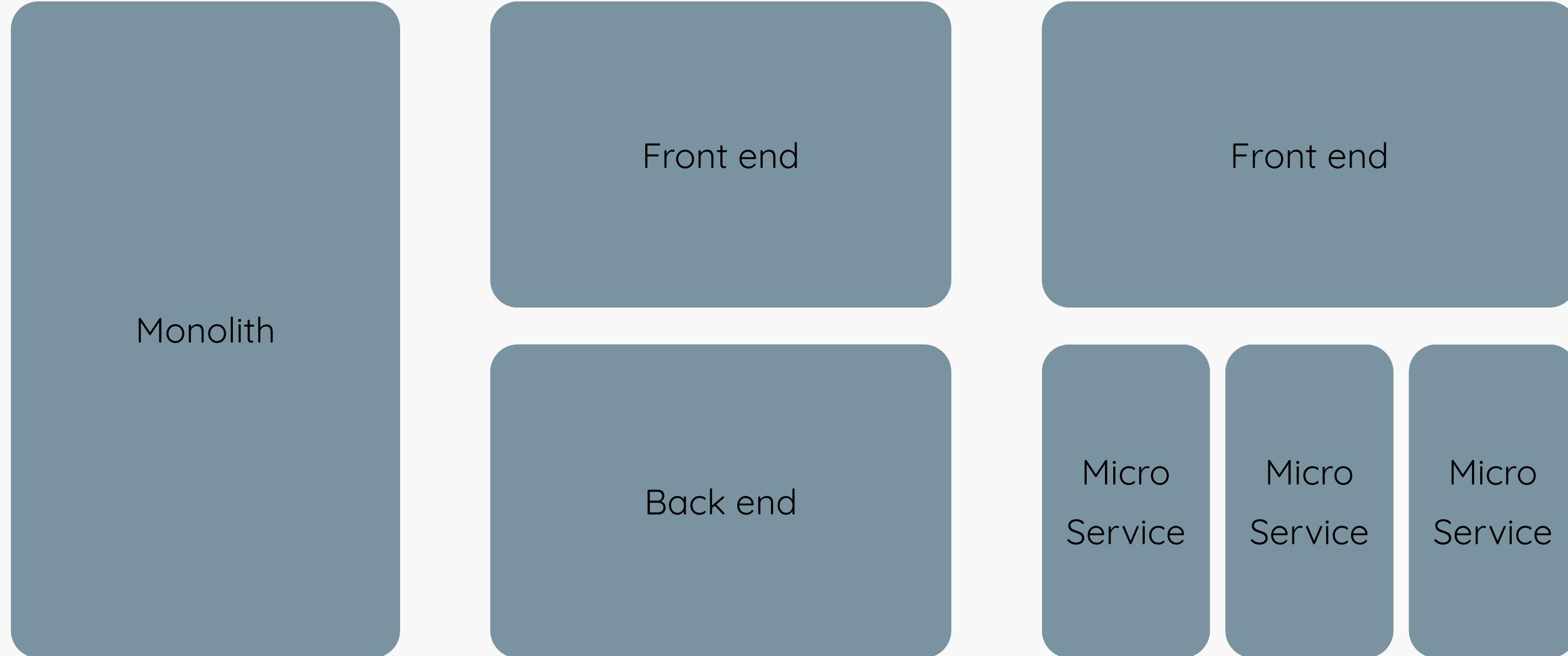


- What is Fullstack development?
- Benefit of fullstack development
- How does web work?
- Front end - Back end
- Front end technology example
- Back end technology example
- Tools introduction for this course
 - Version control
 - Git
 - Visual Studio Code
 - Node JS
 - PostgreSQL
 - Angular
 - Express JS
- Course syllabus

How does web work?



What is Fullstack development?



What is Fullstack development?

Full stack development is the process of developing both the frontend and backend of applications. Any application has a frontend (user-facing) component and a backend (database and logic) component. The frontend contains the user interface and code related to user interactions with the application. The backend contains all the code required for the application to run, including integrations with data systems, communicating with other applications, and processing data.



<https://aws.amazon.com/what-is/full-stack-development/>

Benefit of fullstack development

• • • •

Efficient resource utilization

reduces the number of specialized roles that an organization needs to fill

Enhanced problem-solving

Their comprehensive understanding of the system architecture and multiple coding languages enables them to identify bottlenecks, conflicts, or inefficiencies that specialized developers might miss



Flexibility and speed

Full-stack developers have the skills to create minimum viable products (MVPs) at a much faster rate



<https://aws.amazon.com/what-is/full-stack-development/>

Front end - Back end

Frontend technology

Frontend technology (or client software) focuses on the client-facing side of development. You code any parts of the graphical user interface (GUI) or the features that users interact with using frontend technology.

The most common frontend languages are:

- Hypertext Markup Language (HTML)
- Cascading Style Sheets (CSS)
- JavaScript

HTML allows you to structure web pages and the content on them. You use CSS to style the content, creating more comprehensive layouts or structures. Finally, JavaScript lets you add interactive features to a webpage, creating dynamic content for users.

<https://aws.amazon.com/what-is/full-stack-development/>

Front end - Back end

Backend technology

Backend technology (or server software) coordinates the exchange of information between the frontend and the server running a webpage. It allows an application to communicate with the main server.

API layer

The API layer receives interactions from the frontend and then communicates these to the storage layer. This layer acts as a bridge between the frontend and the backend.

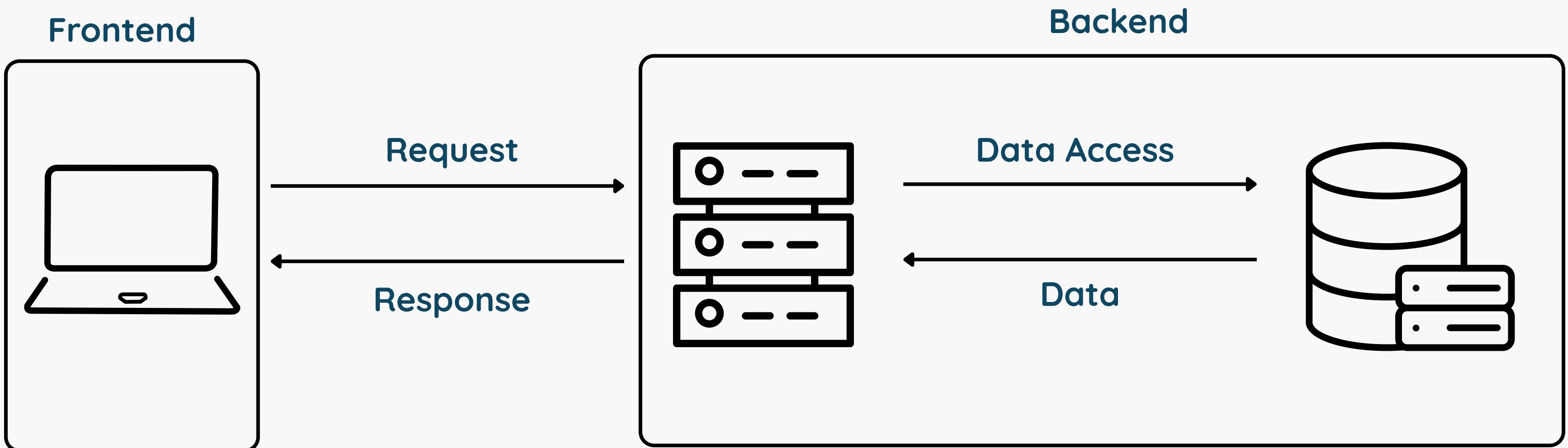
Storage layer

The storage layer manages and stores any application data. It will communicate with databases to write and read data, while providing access to data.

Business logic layer

The business logic layer is the main core of the backend. Backend developers configure processing logic in this layer, changing the response a certain API request delivers.

How does web work?



Front end technology example

- Html
- CSS
- Javascript
- Angular
- Vue
- React
- Flutter

Back end technology example

- Web Server
 - Dotnet Web API
 - JSP
 - PHP
 - Express JS
- Database
 - MySQL
 - Postgres
 - MongoDB
 - Firebase
 - SQL Server
 - Oracle

Tools introduction for this course

- **Git**
 - <https://desktop.github.com/download>
- **Visual Studio Code (IDE)**
 - <https://code.visualstudio.com/download>
- **Node JS (Web Server)**
 - <https://nodejs.org/en/download>
- **PostgreSQL (Database)**
 - <https://www.postgresql.org/download/windows>
- **Docker Desktop**
 - <https://www.docker.com/products/docker-desktop/>
- **Angular (Front end framework)**
 - `npm install -g @angular/cli`
- **Express JS (Web Server)**
 - `npm install express --save`

File Edit View Repository Branch Help

Current repository testrepo Current branch features/changetext Fetch origin Last fetched 2 minutes ago

Changes History Filter 0 changed files

No local changes

There are no uncommitted changes in this repository. Here are some friendly suggestions for what to do next.



Preview the Pull Request from your current branch
The current branch (features/changetext) is already published to GitHub. Preview the changes this pull request will have before proposing your changes.
Branch menu or [Ctrl + Alt + P](#)

Preview Pull Request

Open the repository in your external editor
Select your editor in [Options](#)
Repository menu or [Ctrl + Shift + A](#)

Open in Android Studio

View the files of your repository in Explorer
Repository menu or [Ctrl + Shift + F](#)

Show in Explorer

Open the repository page on GitHub in your browser
Repository menu or [Ctrl + Shift + G](#)

View on GitHub

Summary (required)

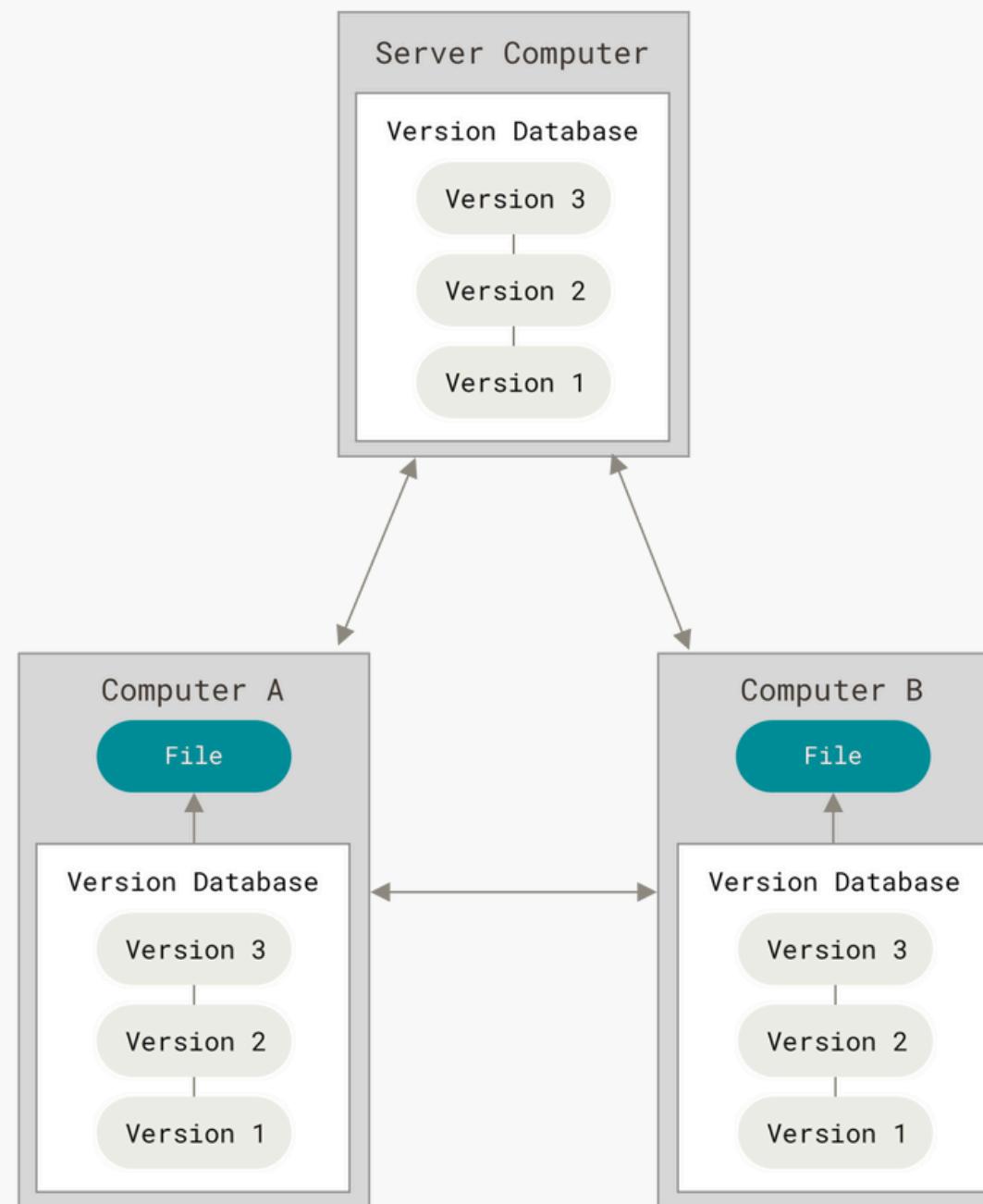
Description

A+ | B+ New

Commit to features/changetext

Version control

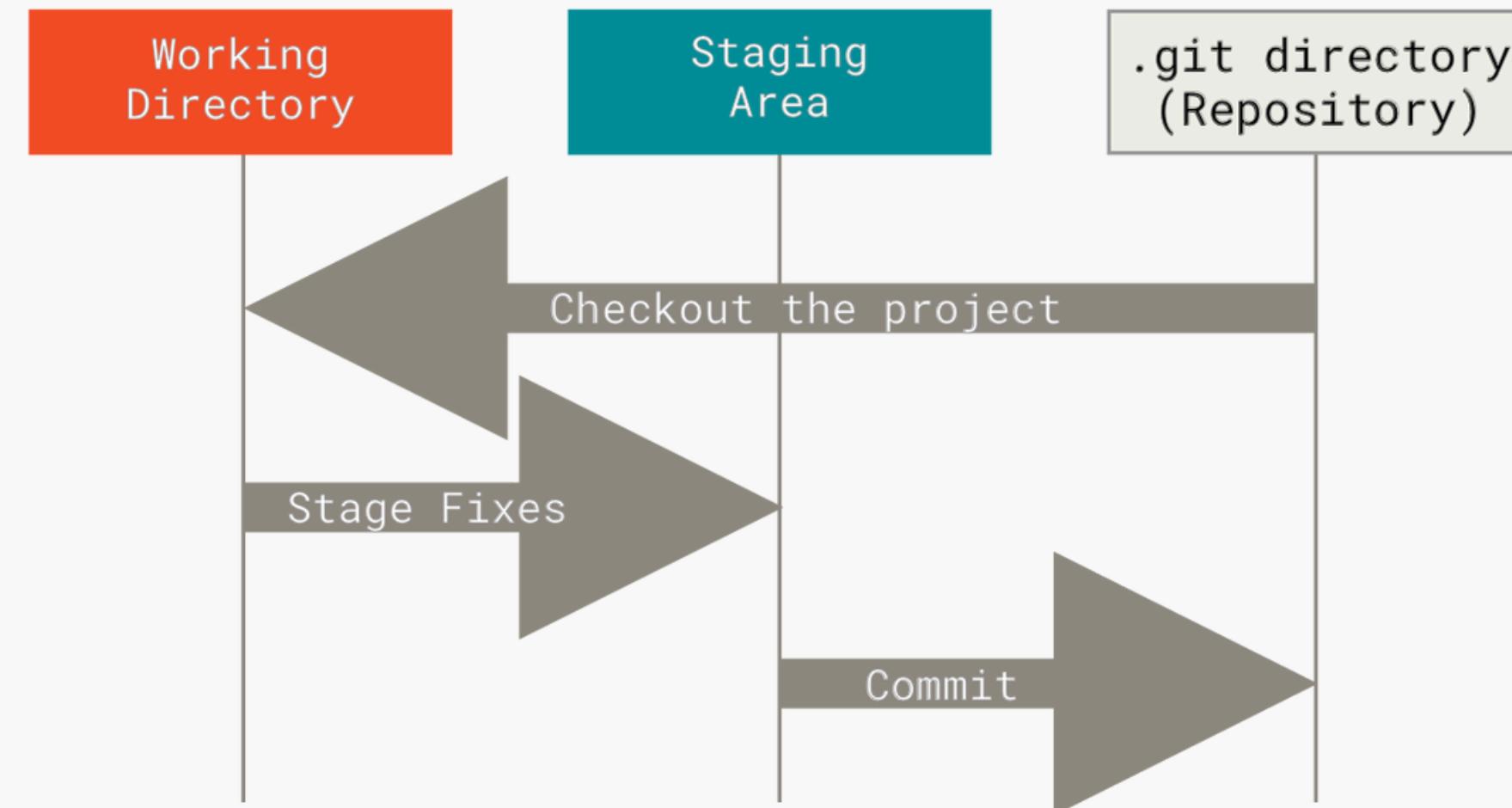
- Why version control?



<https://git-scm.com/book/ms/v2/Getting-Started-About-Version-Control>

Git

- What is Git?



<https://git-scm.com/book/en/v2/Getting-Started-What-is-Git%3F>

Visual Studio Code

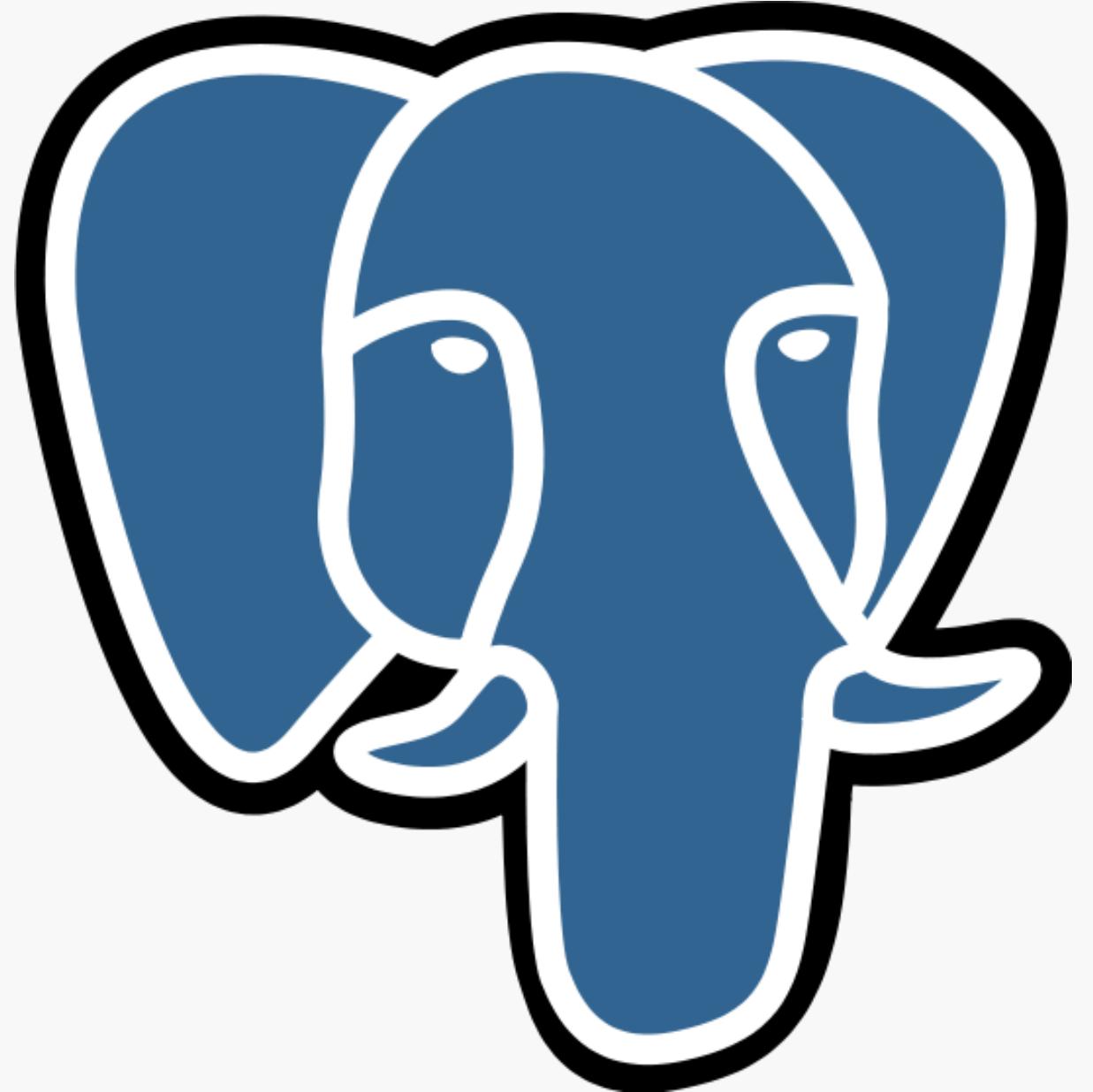
The screenshot shows the Visual Studio Code interface with the following details:

- Explorer View:** Shows a project structure under "HIKING-JOURNAL" with files "functionality.md" and "index.html".
- Code Editor:** Displays the content of "index.html".

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Hiking Journal</title>
    <link rel="stylesheet" href="styles.css">
    <link rel="preconnect" href="https://fonts.googleapis.com">
    <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin="anonymous" />
    <link href="https://fonts.googleapis.com/css2?family=PT+Serif:wght@400;700&display=block" rel="stylesheet">
</head>
<body>
    <main>
        <header>
            <h1>Hiking journal</h1>
            <button class="add-button" aria-label="Add new entry">
                <svg width="24" height="24" viewBox="0 0 24 24" fill="none" stroke="currentColor" stroke-width="2" stroke-linecap="round" stroke-linejoin="round">
                    <path d="M12 5V19M5 12H19" stroke="currentColor" stroke-width="2" stroke-linecap="round" stroke-linejoin="round"/>
                </svg>
            </button>
        </header>
        <article class="journal-entry">
            <div class="entry-header">
                <div class="meta-info">
                    <span class="date">March 10, 2025</span>
                    <span class="separator">|</span>
                    <span class="location">2201 Imola Ave. Napa, CA 94559</span>
                </div>
                <h2>Morning hike at Skyline Wilderness Park</h2>
            </div>
            <p>For my hike this morning I did the Skyline Trail and Manzanita Creek. The weather was perfect for a morning hike. The trail was well-maintained and the views were stunning. I took some photos along the way and will add them to the journal entries later.</p>
            
        </article>
    </main>
</body>
</html>
```
- GitHub Copilot Panel:** A sidebar on the right shows a conversation with GitHub Copilot about creating a landing page based on Figma designs.
- Bottom Status Bar:** Shows file status (2 file changed), GitHub integration, and other system information like line and column numbers.

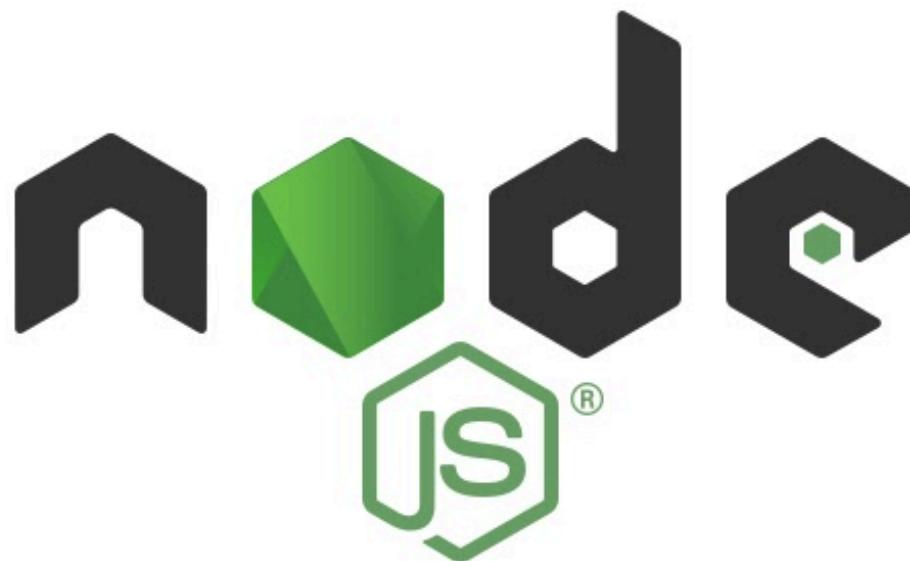
PostgreSQL

PostgreSQL is a powerful, open source object-relational database system that uses and extends the SQL language combined with many features that safely store and scale the most complicated data workloads. The origins of PostgreSQL date back to 1986 as part of the POSTGRES project at the University of California at Berkeley and has more than 35 years of active development on the core platform.



Node JS

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



Node Package Manager (NPM)

npm is the world's largest software registry. Open source developers from every continent use npm to share and borrow packages, and many organizations use npm to manage private development as well.



Angular

Angular is a web framework that empowers developers to build fast, reliable applications.

Maintained by a dedicated team at Google, Angular provides a broad suite of tools, APIs, and libraries to simplify and streamline your development workflow. Angular gives you a solid platform on which to build fast, reliable applications that scale with both the size of your team and the size of your codebase.



Express JS

Fast, unopinionated, minimalist web framework for Node.js

The logo consists of the word "express" in a lowercase, sans-serif font. The letters are thin and dark grey. The "e" and "x" are connected by a horizontal stroke, and the "p" and "r" are also connected by a horizontal stroke. The "o" is a simple circle. The "s" has a vertical stem on the right side.

Course Syllabus

- Introduction
- Basic Front End
- Responsive Design
- Angular Fundamental
- Angular Routing / Service / Form
- Version Control
- API / NodeJS / Express
- DB & PostgreSQL
- Authentication / Authorization / OAuth / JWT
- API Integration
- Logging / Monitoring
- Docker Fundamental
- Web Security / OWASP