LLMs in Action: Developing a COM AI Player for an Interactive Tic-Tac-Toe Game using OpenAI Developer API

Lesson 0: Course Overview

Priscilla Emasoga

COM3550 Undergraduate Ambassadors Scheme
University of Sheffield

Background

APIs (Application Programming Interfaces) power the modern web, enabling communication between applications and services. Yet, many students either encounter these concepts only through theoretical lessons or don't see them until very late in their academic journey.

This course provides hands-on experience with REST APIs, and client-server architecture. Students will develop the technical skills and understanding needed to build, integrate, and work with APIs — key skills every software engineer needs.

Objectives & Prerequisites

What You'll Learn:

- How **Large Language Models (LLMs)** work and how to interact with them via APIs.
    - *We have a pretty cool project coming up!*
- Fundamentals of **REST APIs** and how they interact with external systems.
- Hands-on experience **developing your own APIs** using Flask and Python.
- Experience with modern web design frameworks, including **React** and **TailwindCSS.**
- How to connect a backend service (web server) with a frontend application (client)

Prerequisites

- Basic understanding of Python, JavaScript, HTML, CSS & Linux

Priscilla Emasoga

- Third year Computer Science student @ **University of Sheffield** (2020 - 2025)
- Incoming Graduate Software Engineer @ **Nomura**

Research

- *Predicting signs of cognitive decline from speech using a computerized agent (AI)*
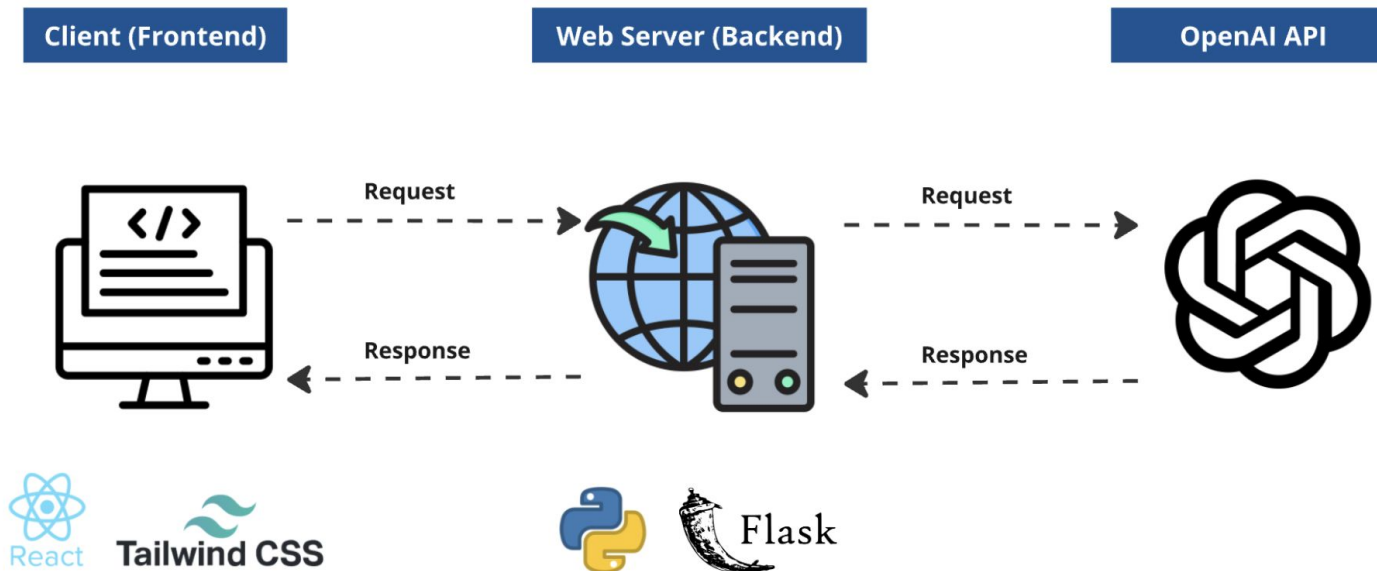
DEMO: Project Overview

DEMO: The Final Project

DEMO: Running the Project Locally

High Level Architecture & Tech Stack

Delivery

This course is split into **two parts (practical & theoretical):**

- **4 Lessons**
  - To explain high-level concepts
  - Walk through project code

- **3 Practical Sessions**
  - Hands on coding sessions
  - Basic exercises to test your understanding

Delivery

Lesson 1 **Large Language Models (LLMs)**
Motivation: A Brief History of Artificial Intelligence
What is an LLM, Applications & Limitations
Careers in AI

Lesson 2 **REST APIs & OpenAI Developer APIs**
What is an API?
REST APIs
OpenAI Developer APIs
Practical 1: Introduction to Rest APIs

Lesson 3 **Building Modern Web Servers with Flask**
What is Flask?
DEMO: The Tic-Tac-Toe Web Server
Best Practices
Practical 2: Restful API Development with Flask

Lesson 4   **Frontend Development with React**

What are Single Page Applications?

Introduction to React

DEMO: The Tic-Tac-Toe Web Client

Practical 3: Introduction to React & Tailwind CSS

Evaluation

1. Your Performance in Practical Sessions

2. End of Project Multiple Choice Quiz

3. Anonymous Feedback Surveys

Questions?