Introduction to Web APIs

Understanding Web APIs and FastAPI in Python

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What is a Web API?

- API (Application Programming Interface) enables communication between systems.

- Web APIs use HTTP(S) protocols to expose functionalities over the web.

- They can return data in JSON or XML formats.

- Common methods: GET, POST, PUT, DELETE.

Web APIs in Python

- Python offers multiple frameworks for building Web APIs:
- Flask – Lightweight, micro web framework.
- Django REST Framework – Full-featured API framework.
- **FastAPI** – Modern, high-performance framework.
- Tornado – Asynchronous framework for real-time applications.
- Bottle – Simple and lightweight API framework.

Introducing FastAPI

- Modern and high-performance web framework for APIs.

- Uses Python type hints for data validation.

- Built on Starlette and Pydantic.

- Asynchronous support with async/await.

- Automatic OpenAPI and Swagger documentation.

FastAPI Example

- Example of a simple FastAPI application:
- from fastapi import FastAPI

- app = FastAPI()

- @app.get('/')
- def read_root():
-     return {'message': 'Hello, World!'}

Advantages of FastAPI

- Fast execution speed, close to Node.js and Go.
- Auto-generation of API documentation (Swagger UI and ReDoc).
- Asynchronous capabilities for better scalability.
- Easy data validation and serialization using Pydantic.
- Ideal for machine learning, microservices, and data-driven applications.

Step-by-step tutorial

- **Setting Up FastAPI** – Installing and configuring FastAPI.
- **Database Integration** – Using SQLite/PostgreSQL with SQLAlchemy.
- **Building the API** – Implementing CRUD operations for products and purchases.
- **Creating a Non-Personalized Recommender** – A simple system recommending top-purchased products.
- **Developing a Simple Frontend** – A basic web page with a recommendation section.

Other Resources

- https://fastapi.tiangolo.com/pt/tutorial/first-steps/

- https://metalplant.com/wp-content/uploads/2023/11/PDFFastAPISlides.pdf

- https://code.visualstudio.com/docs/python/tutorial-fastapi

- https://www.datacamp.com/tutorial/introduction-fastapi-tutorial

- https://realpython.com/fastapi-python-web-apis/