Milestone 6: Dockerization of PM2.5 Forecast API

# Objective

To containerize the PM2.5 prediction API using Docker to ensure environment consistency, simplified deployment, and ease of testing across platforms.

# Approach

- Used Python 3.11-slim base image for minimal footprint.

- Installed Poetry as the dependency manager.

- Installed project dependencies with `--no-dev` and `--no-root` flags.

- Copied codebase and exposed FastAPI on port 8000.

- Entrypoint uses Uvicorn to serve the application.

# Dockerfile Highlights

- Uses layer caching via Poetry lockfiles.

- Excludes unnecessary files via `.dockerignore`.

- Ensures `.env` is either copied or injected at runtime.

# Build & Run

Build image:

docker build -t pm25-api .

Run with `.env` injected securely:

docker run -p 8000:8000 pm25-api

# Outcome

The API is now fully containerized, making it portable and deployable in any Docker-compatible environment.