**Container Documentation**

**Note: Make sure you have installed all the dependencies before running the script file. Some of them are Ansible, Python 3, Python Libraries: FastAPI, uvicorn, pydantic, Make, curl**

Python Code Deployment in a Container

**Step 1: Dockerfile Optimization**

I optimized the Dockerfile using a smaller base image, python:3.9-slim, for the final production stage. This choice reduces the overall size of the container and improves deployment efficiency.

A screenshot of a computer program

Description automatically generated

To reduce the overall image size, I use a smaller base image (python:3.9-slim) for the final production stage.

I set environment variables PYTHONDONTWRITEBYTECODE and PYTHONUNBUFFERED to prevent Python from writing bytecode files and to ensure that Python output is sent straight to the terminal without buffering.

I copy only the necessary files (main.py, APIs.py, and requirements.txt) into the container.

I installed the dependencies specified in requirements.txt.

I expose port 8000, the port on which your FastAPI application will run.

Finally, I specify the command to run your FastAPI application using uvicorn.

**Step 2: To automate the whole process, I have added Makefile**

Build Docker Image:



Run Docker Container:



Stop Docker Container:



Remove Docker Container:



Clean Up Docker Images:



View Docker Container Logs:



Restart Docker Container:



Run All Steps:



This setup ensures that the Python FastAPI application is deployed efficiently within a Docker container and can be easily managed using Makefile commands.

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Code before Optimization

# Use a minimal base image

FROM python:3-slim

# Set the working directory inside the container

WORKDIR /app

# Copy only the necessary files

COPY main.py .

COPY APIs.py .

# Install dependencies

RUN pip install fastapi uvicorn

# Clean up unnecessary files

RUN apt-get update && I am running a few minutes late; my previous meeting is running over.

apt-get autoremove -y && \

apt-get clean && \

rm -rf /var/lib/apt/lists/\* /tmp/\* /var/tmp/\*

# Expose the port on which the FastAPI server will run

EXPOSE 8000

# Command to run the FastAPI server

CMD ["uvicorn", "main:app", "--host", "0.0.0.0", "--port", "8000"]