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Program 1: Build a Docker Container from a Custom Dockerfile

Project Structure:

Program-1/

-------> Dockerfile

-------> requirements.txt

-------> app.py

STEP 1: Create a **Dockerfile** and add the following content.

```
  GNU nano 7.2
FROM python:3.9-slim
WORKDIR /app
COPY requirements.txt .
RUN pip install --no-cache-dir -r requirements.txt
COPY . .
ENV FLASK_APP=app.py
ENV FLASK_RUN_HOST=0.0.0.0
ENV FLASK_RUN_PORT=5000
EXPOSE 5000
CMD ["flask","run"]
```

STEP 2: Create a Python file -**app.py**

```
  GNU nano 7.2
from flask import Flask
app=Flask(__name__)
@app.route("/")
def hello():
 return "Hello Docker!"
if __name__ == "__main__" :
 app.run(host="0.0.0.0",port=5000)
```
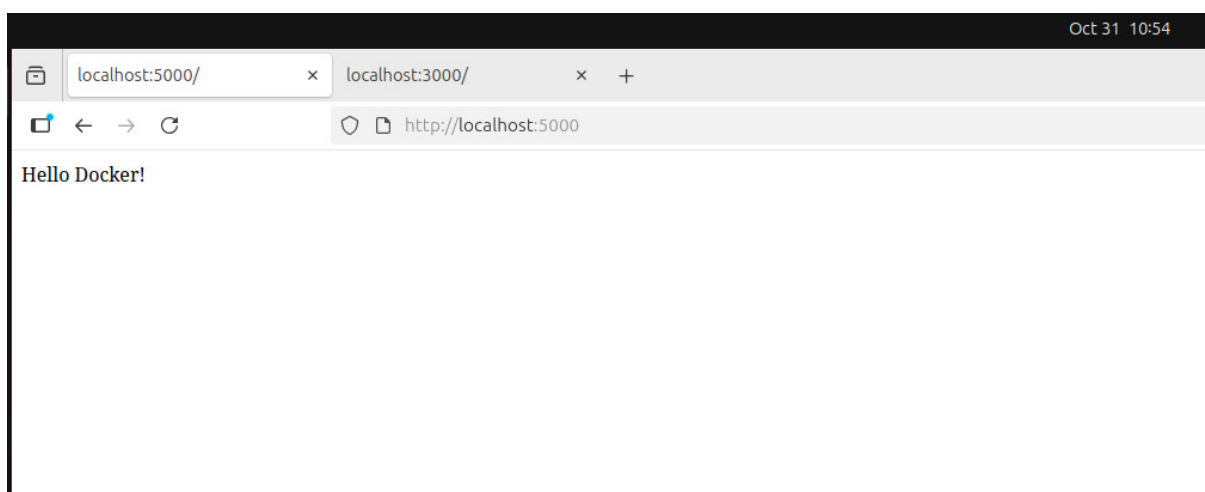
STEP 3: Create a simple text file – **requirements.txt** & add the following

flask

STEP 4: Execute the Docker Build command on the Terminal to build the Docker image and then execute the Docker run command specifying the Port Number for the container.

```
1rv24mc012_akanksha@akanshasPC:~/Program-1$ sudo docker build -t program-1 .
[+] Building 4.8s (10/10) FINISHED                          docker:default
 => [internal] load build definition from Dockerfile              0.0s
 => => transferring dockerfile: 262B                              0.0s
 => [internal] load metadata for docker.io/library/python:3.9-slim  4.4s
 => [internal] load .dockerignore                                 0.0s
 => => transferring context: 2B                                   0.0s
 => [1/5] FROM docker.io/library/python:3.9-slim@sha256:545badebace9a958b  0.0s
 => [internal] load build context                                0.0s
 => => transferring context: 264B                                 0.0s
 => CACHED [2/5] WORKDIR /app                                      0.0s
 => CACHED [3/5] COPY requirements.txt .                           0.0s
 => CACHED [4/5] RUN pip install --no-cache-dir -r requirements.txt  0.0s
 => [5/5] COPY . .                                                 0.1s
 => exporting to image                                            0.1s
 => => exporting layers                                           0.1s
 => => writing image sha256:497451d232f6061cb8a04f35eb2a2ab23c61386980078  0.0s
 => => naming to docker.io/library/program-1                      0.0s
1rv24mc012_akanksha@akanshasPC:~/Program-1$ sudo docker run -it -p 5000:5000 program-1
 * Serving Flask app 'app.py'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.17.0.3:5000
Press CTRL+C to quit
172.17.0.1 - - [31/Oct/2025 05:22:07] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [31/Oct/2025 05:22:07] "GET /favicon.ico HTTP/1.1" 404 -
```

STEP 5: Test the Container by verifying the localhost details on web browser, the text → Hello Docker! Will be displayed.

STEP 6: Stop the container with the container number, remove the docker container and delete the Docker Image with the name program-1

docker container stop <Container-number>

docker container rm <Container-number>

docker image rm program-1