

## Program 3: Containerize a Dedicated Python Flask / Node.js Application

### Project Structure

```
program-3/  
|  
├── requirements.txt  
├── Dockerfile  
└── app.py
```

### Step 1: Create the Dockerfile

**Filename:** Dockerfile

# Use official Python image

FROM python:3

# Set the working directory

WORKDIR /app

# Copy requirements file and install dependencies

COPY requirements.txt .

RUN pip install --no-cache-dir -r requirements.txt

# Copy application code

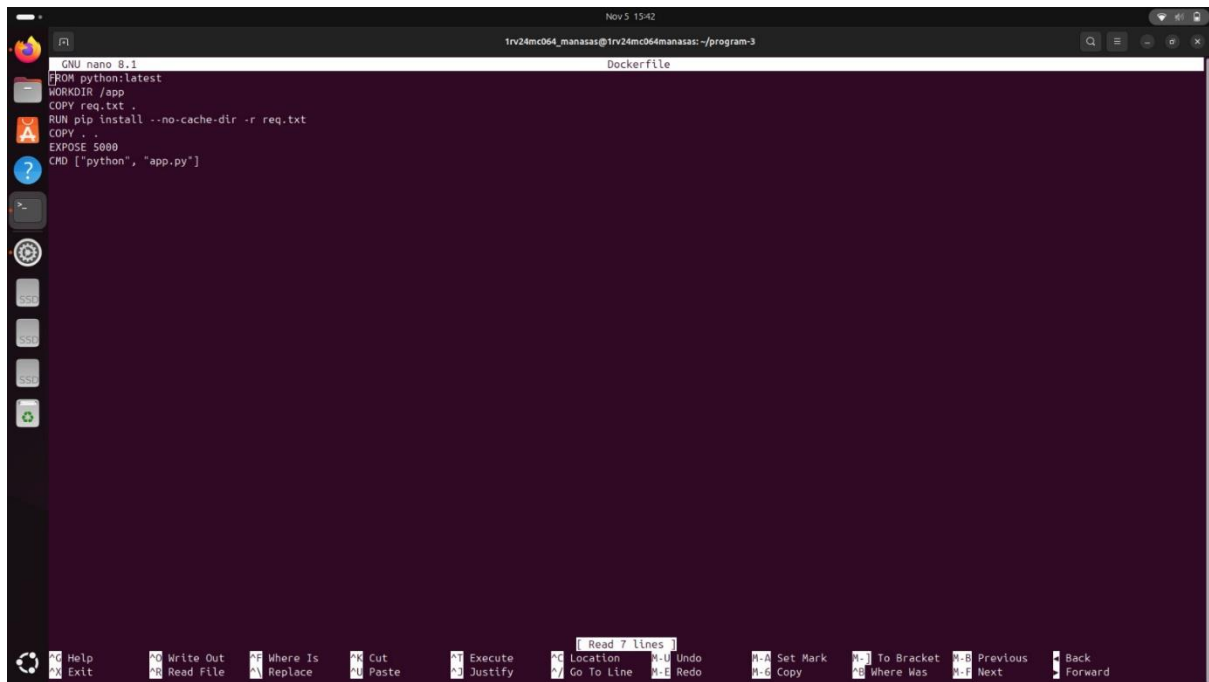
COPY . .

# Expose the port Flask will run on

EXPOSE 5000

# Run the Flask application

CMD ["python", "app.py"]



## Step 2: Create the Flask Application

**Filename:** app.py

```
from flask import Flask
```

```
app = Flask(__name__)
```

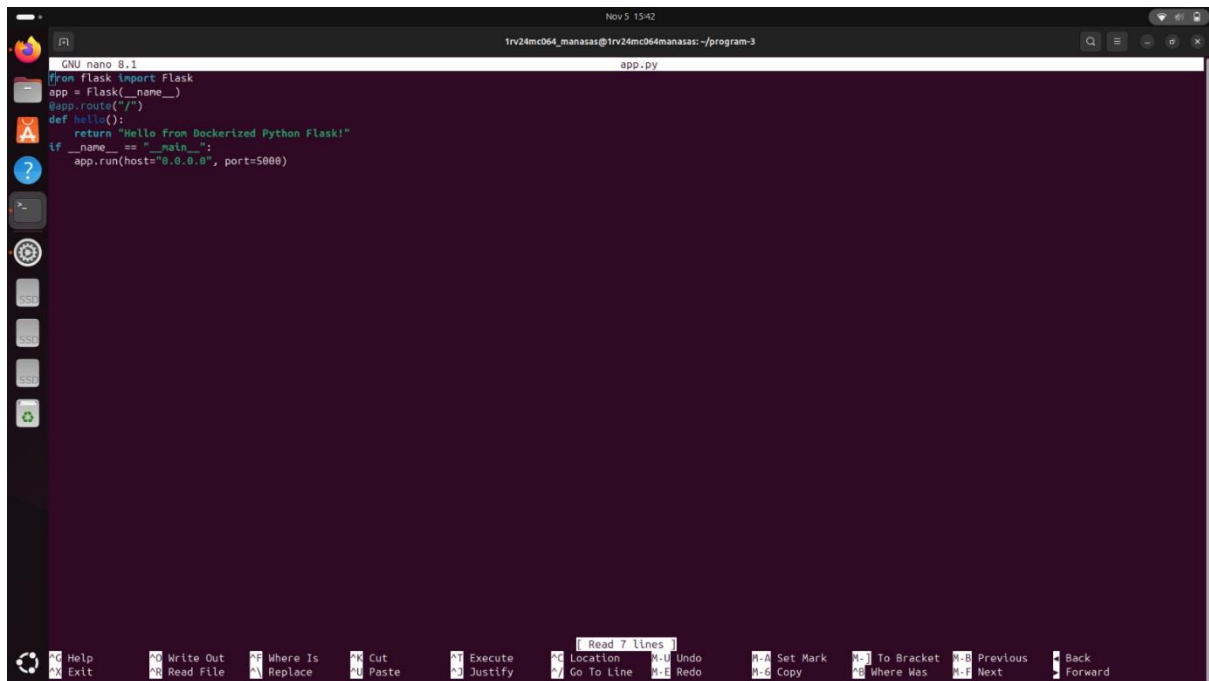
```
@app.route('/')
```

```
def hello():
```

```
    return "Hello from Simple Flask Docker!"
```

```
if __name__ == "__main__":
```

```
    app.run(host="0.0.0.0", port=5000)
```

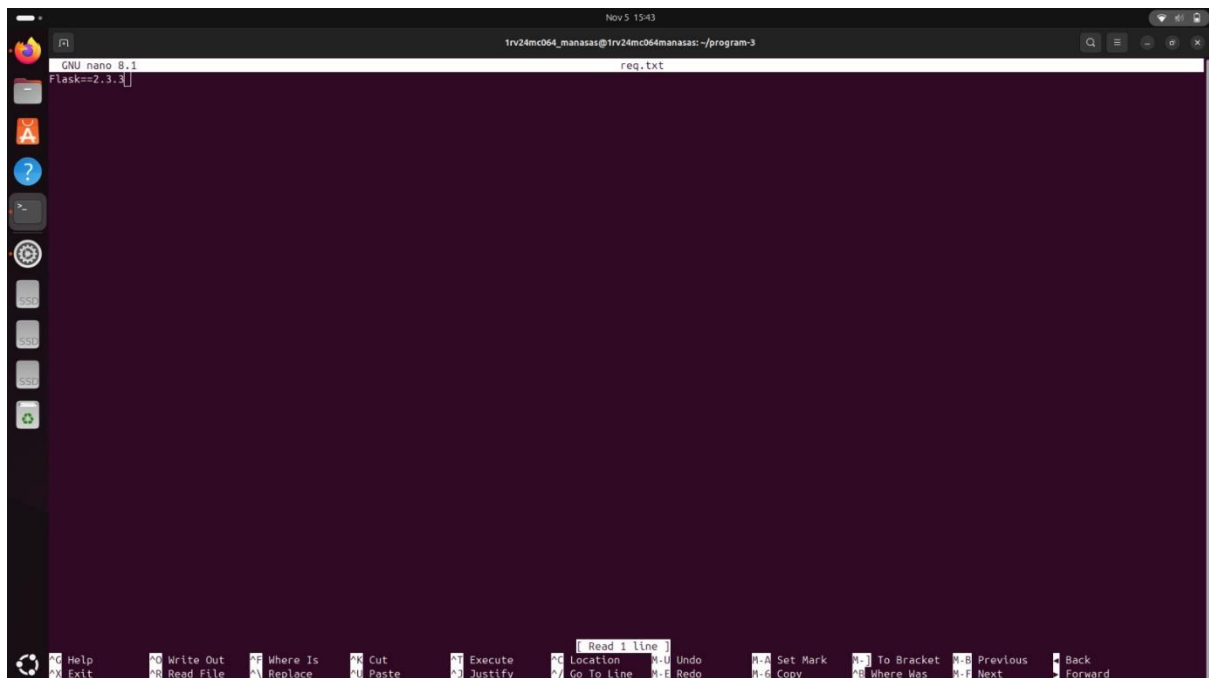


```
GNU nano 8.1 app.py
from flask import Flask
app = Flask(__name__)
@app.route("/")
def hello():
    return "Hello from Dockerized Python Flask!"
if __name__ == "__main__":
    app.run(host="0.0.0.0", port=5000)
```

### Step 3: Create the Requirements File

Filename: requirements.txt

Flask==2.3.3



```
GNU nano 8.1 req.txt
Flask==2.3.3
```

### Step 4: Build the Docker Image

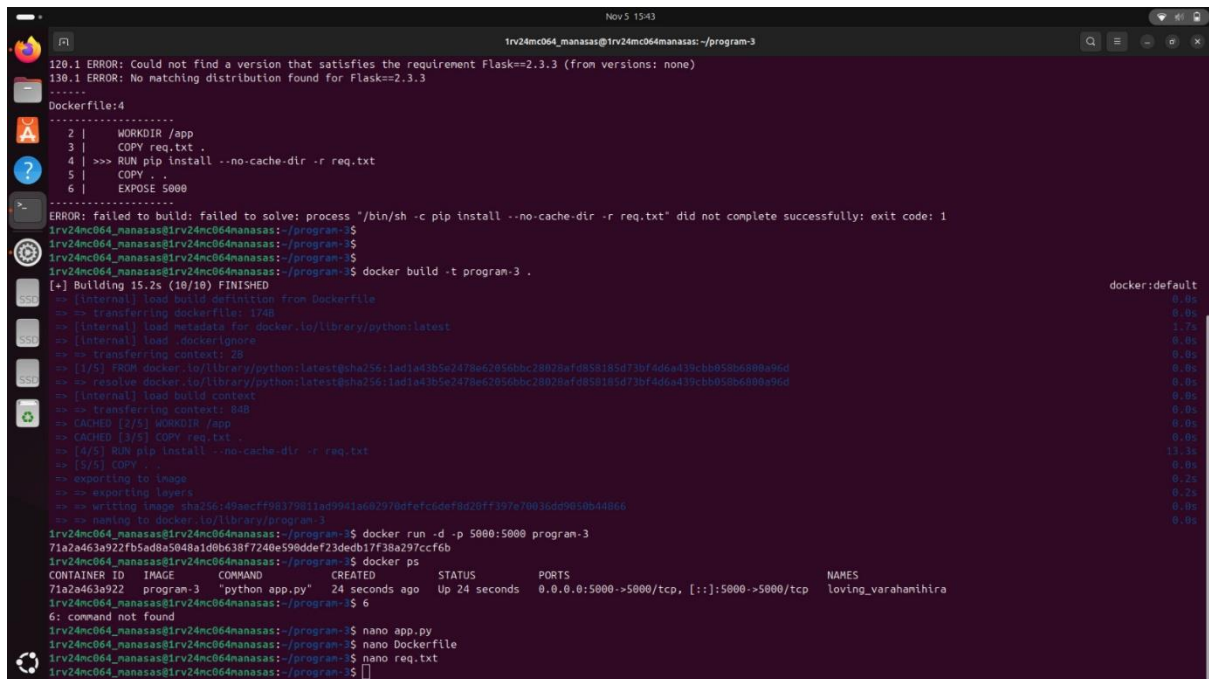
Run the following command in your terminal (inside the project directory):

`docker build -t program-3 .`

## Step 5: Run the Docker Container

Map port **5000** inside the container to **5000** on the host:

`docker run -p 5000:5000 program-3`



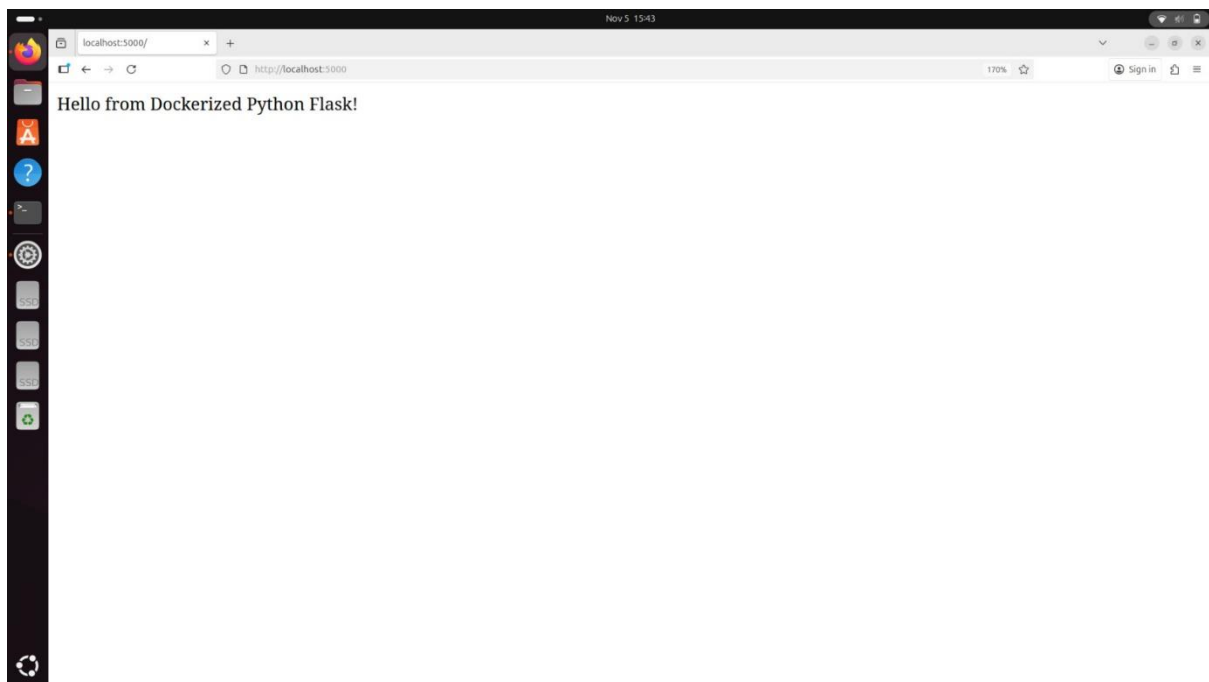
The terminal shows the Docker build and run process. It starts with an error about Flask version, followed by the Dockerfile content. The build process completes successfully, and the container is run with port 5000 mapped to port 5000. The container ID is 71a2a463a922, and the command is 'python app.py'.

```
120.1 ERROR: Could not find a version that satisfies the requirement Flask==2.3.3 (from versions: none)
130.1 ERROR: No matching distribution found for Flask==2.3.3
-----
Dockerfile:4
-----
2 | WORKDIR /app
3 | COPY req.txt .
4 | >>> RUN pip install --no-cache-dir -r req.txt
5 | COPY . .
6 | EXPOSE 5000
-----
ERROR: failed to build: failed to solve: process "/bin/sh -c pip install --no-cache-dir -r req.txt" did not complete successfully: exit code: 1
1rv24nc064_manasas@1rv24nc064manasas: ~/program-3
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ docker build -t program-3 .
[*] Building 15.2s (10/10) FINISHED
[+] Building 15.2s (10/10) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 174B
=> [internal] load metadata for docker.io/library/python:latest
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/5] FROM docker.io/library/python:latest@sha256:1ad1a43b5e2478e62056b0c28028afd858185d73bf4d6a439cbb55b6808a96d
=> => resolve docker.io/library/python:latest@sha256:1ad1a43b5e2478e62056b0c28028afd858185d73bf4d6a439cbb55b6808a96d
=> [internal] load build context
=> => transferring context: 84B
=> CACHED [2/5] WORKDIR /app
=> CACHED [3/5] COPY req.txt .
=> [4/5] RUN pip install --no-cache-dir -r req.txt
=> [5/5] COPY . .
=> => exporting layers
=> => writing image sha256:49aacf98379811ad99a1a682970dfc5def8d20ff397e7083cd29050b44066
=> push to docker.io/library/program-3
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ docker run -d -p 5000:5000 program-3
71a2a463a922fb5ad8a5048a1d0b638f7240e598dde723deb17f38a297ccf6b
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
71a2a463a922   program-3   "python app.py"         24 seconds ago Up 24 seconds  0.0.0.0:5000->5000/tcp, [::]:5000->5000/tcp   loving_varahamihira
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ 6: command not found
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ nano app.py
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ nano Dockerfile
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$ nano req.txt
1rv24nc064_manasas@1rv24nc064manasas:~/program-3$
```

## Step 6: Test the Application

Open your web browser and go to:

<http://localhost:5000/> Hello from Simple Flask Docker!



**Expected Output** - Hello from Simple Flask Docker!

