

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"]
```

```
Nov 5 15:42
1rv24mc064_manasa@1rv24mc064manasa:~/program-3
Dockerfile

GNU nano 8.1
FROM python:latest
WORKDIR /app
COPY req.txt .
RUN pip install --no-cache-dir -r req.txt
COPY . .
EXPOSE 5000
CMD ["python", "app.py"]
```

File menu: Help, Exit, Read File, Replace, Cut, Paste, Execute, Justify, Location, Go To Line, Undo, Redo, Set Mark, To Bracket, Copy, Where Was, Previous, Next, Back, Forward.

Step 2: Create the Flask Application

Filename: app.py

```
from flask import Flask

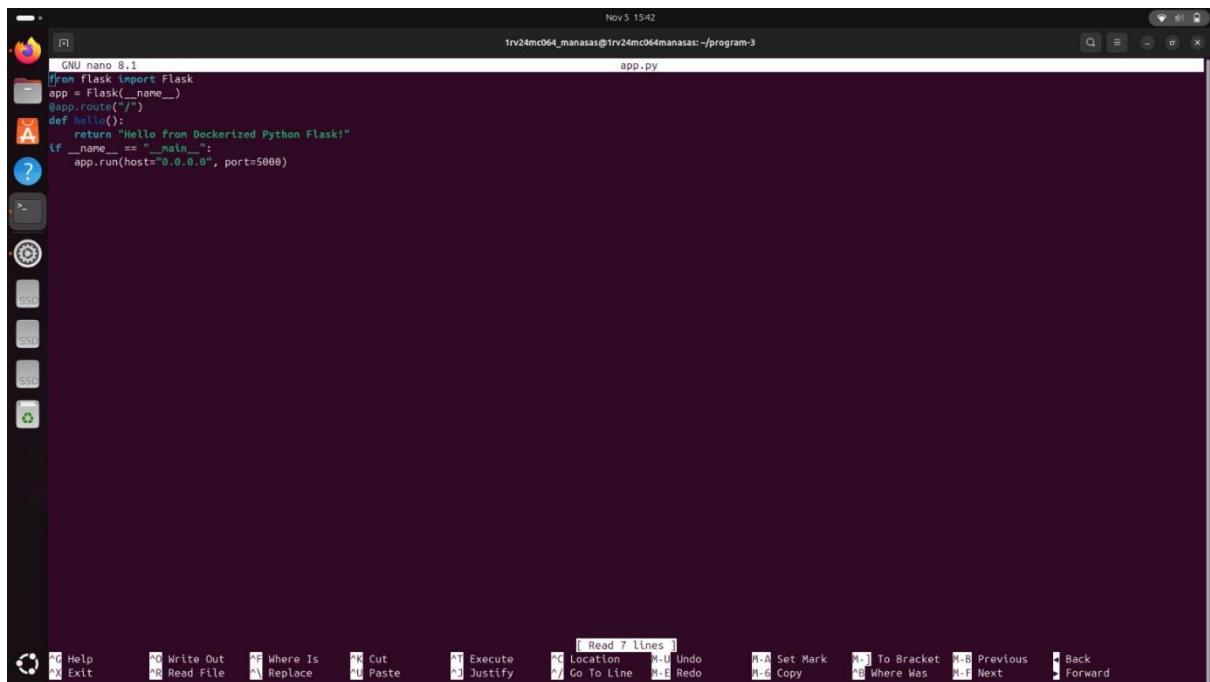
app = Flask(__name__)

@app.route('/')

def hello():

    return "Hello from Simple Flask Docker!"

if __name__ == "__main__":
    app.run(host="0.0.0.0", port=5000)
```

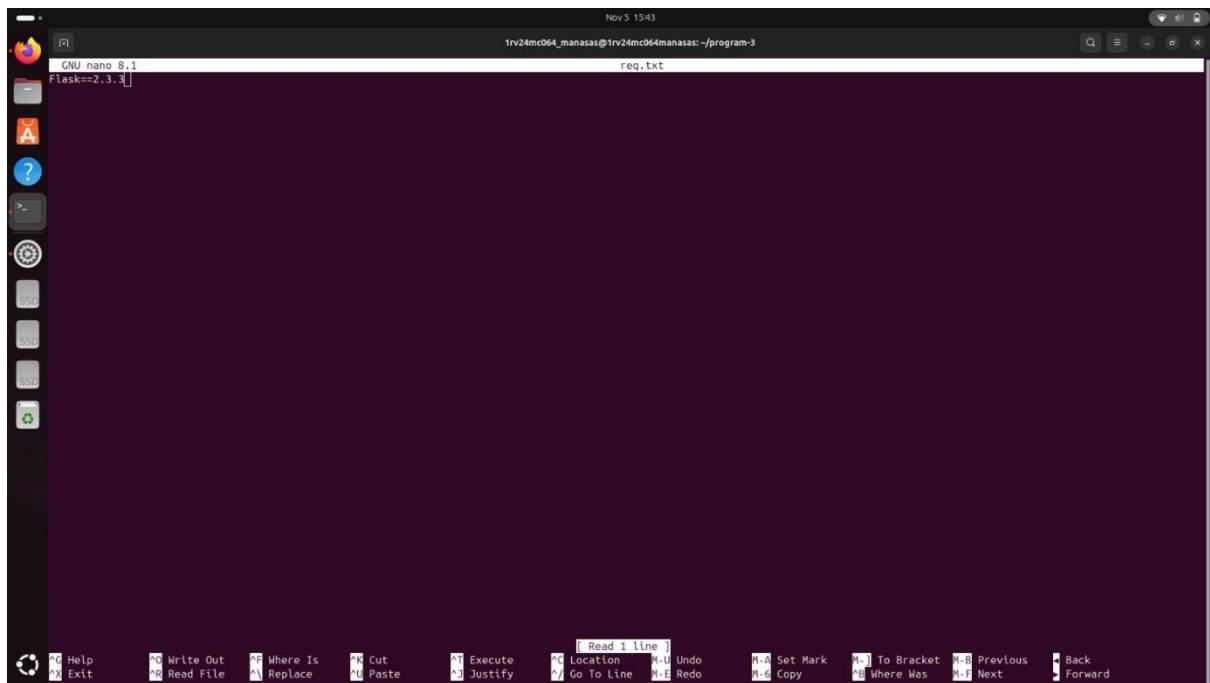


```
GNU nano 8.1
[1] 1rv24mc064_manasas@1rv24mc064manasas:~/program-3
from flask import Flask
app = Flask(__name__)
@app.route("/")
def hello():
    return "Hello from Dockerized Python Flask!"
if __name__ == "__main__":
    app.run(host="0.0.0.0", port=5000)
```

Step 3: Create the Requirements File

Filename: requirements.txt

Flask==2.3.3



```
GNU nano 8.1
[1] 1rv24mc064_manasas@1rv24mc064manasas:~/program-3
req.txt
Flask==2.3.3
```

Step 4: Build the Docker Image

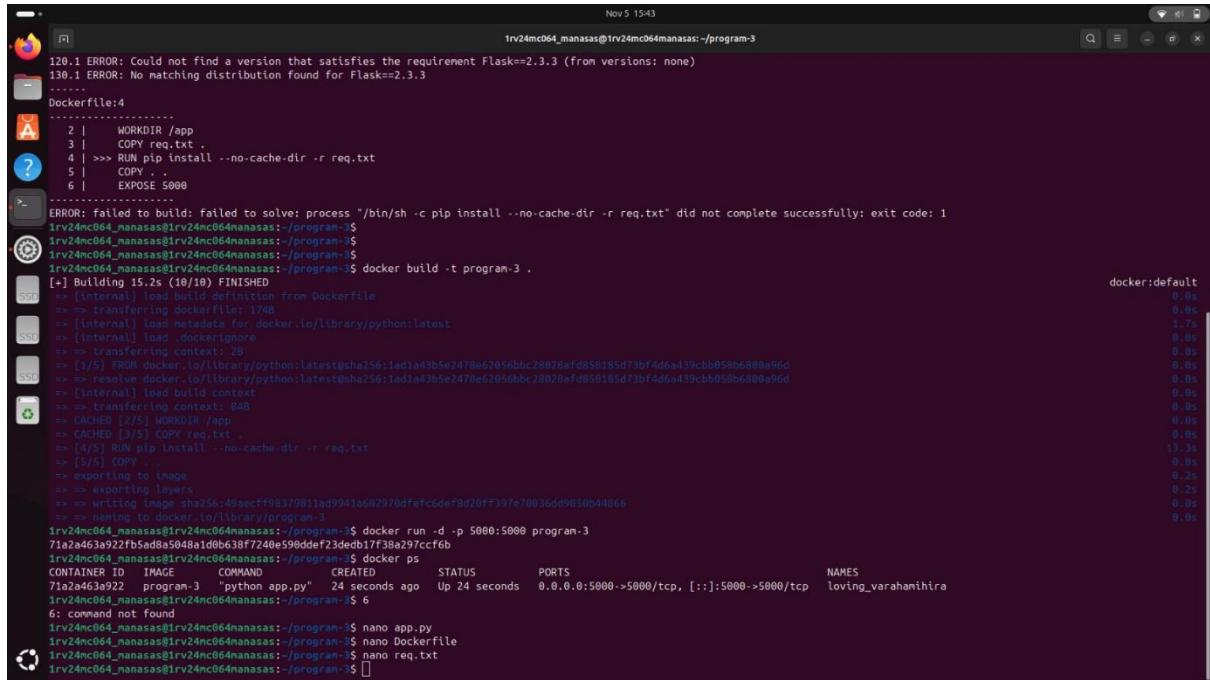
Run the following command in your terminal (inside the project directory):

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
```

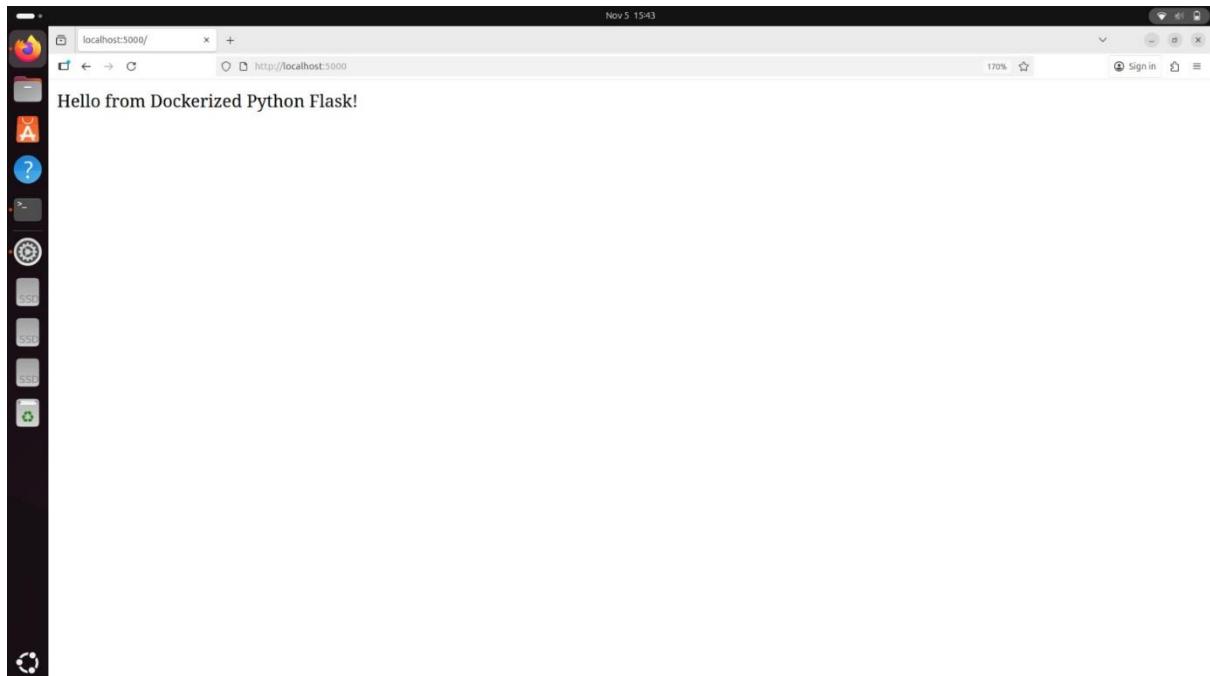


```
Nov 5 15:43
1rv24mc064_manasas@1rv24mc064manasas:~/program-3
128.1 ERROR: Could not find a version that satisfies the requirement Flask==2.3.3 (from versions: none)
130.1 ERROR: No matching distribution found for Flask==2.3.3
.....
Dockerfile:4
.....
2 |   WORKDIR /app
3 |   COPY req.txt .
4 |   >>> 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
1rv24mc064_manasas@1rv24mc064manasas:~/program-3
1rv24mc064_manasas@1rv24mc064manasas:~/program-3
1rv24mc064_manasas@1rv24mc064manasas:~/program-3
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ docker build -t program-3 .
[+] Building 15.2s (10/18) FINISHED
   = [internal] load build definition from Dockerfile
   = [internal] load .dockerignore
   = [internal] load /.dockerignore
   = [internal] transfer context: 94B
   = [internal] load metadata for docker.io/library/python:latest
   = [internal] load /etc/docker/registries.conf
   = [internal] transfer context: 94B
   = [internal] resolve docker.io/library/python:latest@sha256:1ad1a43b5e2478e62056bbc28028afdf858185d73bf4d6a439ccb050b6800a96d
   = [internal] load build context
   = [internal] transfer context: 94B
   = [internal] cache key: sha256:d9acff98379811ad9941a602970defc0def8d20ff397e70036dd9050b44866
   = [internal] write to file: /var/lib/docker/tmp/docker-builder98379811ad9941a602970defc0def8d20ff397e70036dd9050b44866
   = [internal] transfer to docker.io/library/python:latest@sha256:d9acff98379811ad9941a602970defc0def8d20ff397e70036dd9050b44866
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ docker run -d -p 5000:5000 program-3
71a2d463a922fb5ad85948a1d0b638f7240e590def23dedb17f38a297ccf6b
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
71a2d463a922 program-3 "python app.py" 24 seconds ago Up 24 seconds 0.0.0.0:5000->5000/tcp, [::]:5000->5000/tcp loving_varahamihira
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ 6: command not found
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ nano app.py
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ nano Dockerfile
1rv24mc064_manasas@1rv24mc064manasas:~/program-3 $ nano req.txt
1rv24mc064_manasas@1rv24mc064manasas:~/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!

