

Program 1

Project Structure:

```
lab1-devops/
|
├── app.py
├── requirements.txt
├── Dockerfile
└── flenv/      # Python virtual environment (local)
    └── README.md
```

Dockerfile:

```
# lab 1 file
FROM python:3.9-slim

WORKDIR /app

COPY requirements.txt .
RUN pip install -r requirements.txt

LABEL maintainer="Kunal"

LABEL version="1.0"

COPY . .

ENV FLASK_APP=app.py
ENV FLASK_RUN_HOST=0.0.0.0
ENV FLASK_RUN_PORT=5000

EXPOSE 5000

CMD ["flask", "run"]
```

app.py

```
from flask import Flask

app = Flask(__name__)

@app.route('/')
def hello():
    pass
```

```
    return "hello world from container"

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

Requirements.txt
Flask

Setup and Installation:

Make sure Python 3 is installed:
python3 --version

If not installed, you can install it (on Ubuntu/Debian):
sudo apt update
sudo apt install python3 python3-venv python3-pip -y

In your project folder (e.g., ~/lab1-devops):
python3 -m venv flenv

Activate the environment:
source flenv/bin/activate

```
(flenv)─(singh@singh)─[~/lab1-devops]
└─$ sudo docker build -t pythonapp:latest .

└─(flenv)─(singh@singh)─[~/lab1-devops]
└─$ sudo docker run -d -p 5000:5000 --name contain-myapplication pythonapp
```

Open:
<http://localhost:5000>



hello world from container

Program 2

Project Structure:

```
lab2-devops/
|
|   └── Dockerfile
|   └── package.json
|   └── package-lock.json
|   └── server.js
|   └── node_modules/
|       └── README.md
```

Dockerfile:

```
FROM node:18-alpine AS builder

ENV APP_PORT=3000

WORKDIR /app

COPY package*.json .

RUN npm install

COPY . .

RUN npm run build

EXPOSE ${APP_PORT}

ENV PORT=${APP_PORT}

CMD ["node", "server.js"]

## developer stage
FROM node:18-alpine AS tester

ENV APP_PORT=3000

WORKDIR /app

COPY --from=builder /app /app
```

```
RUN adduser -D app

USER app

EXPOSE ${APP_PORT}

ENV PORT=${APP_PORT} NODE_ENV=development

CMD ["node", "server.js"]
```

server.js:

```
const express = require('express');
const app = express();
const port = 3000;

app.get('/', (req, res) => {
  res.send('Hello World from docker container!');
});

app.listen(port, () => {
  console.log(`Server is running at http://localhost:${port}`);
});
```

Setup and Installation:

Verify [Node.js](#) and npm installation:

Node –version

Npm –version

Initialize npm:

Npm init -y

(This creates a package.json file with default settings)

Install express:

Npm install express

(Express will be added to dependencies in package.json)

Build Builder Image:

sudo docker build –target builder -t jsapp-bui .

Build Tester Image:

```
sudo docker build --target tester -t jsapp-tes .
```

(This creates the final image using the built files from the first stage.)

(singh@singh)-[~/lab2-devops]

```
└─$ sudo docker run -d -p 3000:3000 --name jsbui jsapp-bui
```

Open:

<http://localhost:3000>



Hello World from docker container!