

Day 20: Building and Running Docker Containers

90 Days DevOps Challenge

Objective

Understand how to create Docker images using Dockerfiles, build them, run containers, and manage images.

What is a Dockerfile?

A Dockerfile is a script containing instructions to build a Docker image.

Acts as a recipe to create isolated environments for applications.

Dockerfile Instructions

FROM: Base image

RUN: Commands to run during build

COPY: Copy files

WORKDIR: Set working directory

CMD: Default command

EXPOSE: Declare port

Docker Image Lifecycle Commands

<code>docker build</code>	Builds an image from a Dockerfile.
<code>docker run</code>	Runs a container from an image.
<code>docker images</code>	Lists all local images.
<code>docker ps</code>	Lists running containers.
<code>docker ps -a</code>	Lists all containers (running and stopped).
<code>Docker stop</code>	Stops a running container
<code>docker rm</code>	Removes a container
<code>docker rmi</code>	Removes an image.
<code>docker tag</code>	Tags an image for pushing.
<code>docker push</code>	Pushes an image to Docker Hub
<code>docker pull</code>	Pulls an image from Docker Hub.
<code>docker commit</code>	Creates an image from a container's changes.

Create Sample flask app

Step 1: Create Python App

```
mkdir docker-python-app && cd docker-python-app
```

app.py:

```
from flask import Flask
```

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

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

```
def hello():
```

```
    return 'Hello from Docker!'
```

```
if __name__ == '__main__':
```

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

Step 2: Dockerfile & Requirements

requirements.txt:

flask

Dockerfile:

FROM python:3.9

WORKDIR /app

COPY . .

RUN pip install -r requirements.txt

EXPOSE 5000

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

Build and Run Container

Build:

```
docker build -t flask-docker-app .
```

Run:

```
docker run -d -p 5000:5000 flask-docker-app
```


Manage Docker Images and Containers

```
docker tag flask-docker-app yourhub/flask-docker-app:v1
```

```
docker login
```

```
docker push yourhub/flask-docker-app:v1
```

```
docker pull nginx
```

```
docker commit <id> custom-nginx:v1
```

Cleanup

```
docker stop <container_id>
```

```
docker rm <container_id>
```

```
docker rmi flask-docker-app
```

Summary

Write Dockerfile

Build & run Docker container

Manage Docker images

Push/pull from Docker Hub