

# DevOps - Git Assignment 06

## Abu Sayed - ICDCP\_28

### Docker Assignment 1

#### Repository Link

<https://github.com/ImAbuSayed/Interactive-Cares-DevOps-Career-Path-Assignment-6/>

#### Project Overview

This project involves creating a Python Flask application, Dockerizing it, and making it multi-stage and multi-platform compatible. The Docker image is then pushed to Docker Hub, and instructions for running containers from the image and opening a shell inside the container are provided.

#### Repository Structure

- app.py: The main Python Flask application.
- requirements.txt: File specifying the Python dependencies for the Flask application.
- Dockerfile: Multi-stage and multi-platform Dockerfile for building the Docker image.
- README.md: This documentation file.

#### Docker Image Information

Docker Hub Repository:

<https://hub.docker.com/repository/docker/imabusayed/docker-assignment-icdcp-28/>

Docker Image Tags: v1

#### Building and Pushing the Docker Image

### 1. Ensure Docker Hub login:

```
docker login -u imabusayed
```

### 2. Build and push the Docker image:

```
docker buildx create --use
```

```
docker buildx inspect --bootstrap
```

```
docker buildx build --platform linux/amd64,linux/arm64 -t  
imabusayed/docker-assignment-icdcp-28:v1 .
```

```
docker push imabusayed/docker-assignment-icdcp-28:v1
```

### 3. Running the Container

```
docker run -d -p 5000:5000 imabusayed/docker-assignment-icdcp-28:v1
```

### 4. Checked shell Inside the Container

```
docker exec -it 6b4d2d7bb9be pwd
```

```
docker exec -it 6b4d2d7bb9be whoami
```

```
docker exec -it 6b4d2d7bb9be ls
```

**Screenshots are in the below:**

The image shows a Visual Studio Code editor window with a dark theme. The top bar indicates the file is named 'Dockerfile' and the workspace is 'Visual Studio Code'. The left sidebar contains the Explorer, Search, and Run and Debug views. The Explorer view shows a file tree with 'Dockerfile' and 'requirements.txt' selected. The main editor area displays the content of the 'Dockerfile' file, which is a multi-stage Docker build script. The script starts with a base image of 'python:3.9-slim AS builder', copies requirements, and then builds a minimal image using 'FROM python:3.9-slim'. It then copies the application code and sets the entry point. The terminal at the bottom shows the output of the 'docker build' command, indicating that the image was built successfully. The terminal output includes details about the build process, such as the image name 'epic-shirley', the platform 'linux/amd64', and the build time. The bottom status bar shows the file is named 'Dockerfile' and the workspace is 'Visual Studio Code'.

File Edit Selection View Go Run Terminal Help

DOCKER ASSIGNMENT ICDCP-28

DOCKERFILE

```
1 # Dockerfile
2
3 # Stage 1: Build Python Flask App
4 FROM python:3.9-slim AS builder
5
6 WORKDIR /app
7
8 COPY requirements.txt
9 RUN pip install --no-cache-dir -r requirements.txt
10
11 COPY app.py -
12
13 # Stage 2: Create a minimal image
14 FROM python:3.9-slim
15
16 WORKDIR /app
17
18 COPY --from=builder /app /app
19
20 EXPOSE 5000
21
22 CMD ["python", "app.py"]
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

GC Policy rules:

All: true

Keep Bytes: 2.794GiB

Build log:

```
1 [INFO] Building docker-container-epic-shirley
2 [INFO] Building 62.7s (18/18) FINISHED
3 [INFO] Internal load build definition from Dockerfile
4 [INFO] Transferring dockerfile: 300B
5 [INFO] [linux/arm64 internal] load metadata for docker.io/library/python:3.9-slim
6 [INFO] [linux/arm64 internal] load metadata for docker.io/library/python:3.9-slim
7 [INFO] [linux/arm64 internal] load metadata for registry1.docker.io
8 [INFO] Internal load dockerignore
9 [INFO] Transferring context: 202B
10 [INFO] [linux/arm64 builder 1/2] FROM docker.io/library/python:3.9-slim@sha256:4c6eef53a727c7c33bf9b0e318c836780ea22040e57f336284eb733ab
11 [INFO] resolve docker.io/library/python:3.9-slim@sha256:4c6eef53a727c7c33bf9b0e318c836780ea22040e57f336284eb733ab
12 [INFO] sha256:6c3036076cc58263628a20e4785c1b7478781802404a1264789 3.13MB / 3.13MB
13 [INFO] sha256:72a2a87c3a16317819938f69b40913081ff4878014126042c3f4 11.50MB / 11.50MB
14 [INFO] sha256:38090623800641649166345c0f909747723487f0e606c3166037 3.13MB / 3.13MB
15 [INFO] sha256:1d6d17378118a154c4384780738cfc463628a38007f0060e8aef 29.19MB / 29.19MB
16 [INFO] sha256:14d9727f8c0131a3e3b36727208f4632943444f19809320 244B / 244B
17 [INFO] extracting sha256:20d6d17378118a154c4384780738cfc463628a38007f0060e8aef
18 [INFO] extracting sha256:38090623800641649166345c0f909747723487f0e606c3166037
19 [INFO] extracting sha256:72a2a87c3a16317819938f69b40913081ff4878014126042c3f4
20 [INFO] extracting sha256:14d9727f8c0131a3e3b36727208f4632943444f19809320
21 [INFO] extracting sha256:6c3036076cc58263628a20e4785c1b7478781802404a1264789
22 [INFO] resolve docker.io/library/python:3.9-slim@sha256:4c6eef53a727c7c33bf9b0e318c836780ea22040e57f336284eb733ab
23 [INFO] sha256:72a2a87c3a16317819938f69b40913081ff4878014126042c3f4 11.50MB / 11.50MB
24 [INFO] sha256:38090623800641649166345c0f909747723487f0e606c3166037 3.13MB / 3.13MB
25 [INFO] sha256:1b67c7f9e072802784c4384780738cfc463628a38007f0060e8aef 29.19MB / 29.19MB
26 [INFO] sha256:14d9727f8c0131a3e3b36727208f4632943444f19809320 244B / 244B
27 [INFO] extracting sha256:1b67c7f9e072802784c4384780738cfc463628a38007f0060e8aef
28 [INFO] extracting sha256:14d9727f8c0131a3e3b36727208f4632943444f19809320
29 [INFO] extracting sha256:38090623800641649166345c0f909747723487f0e606c3166037
30 [INFO] extracting sha256:72a2a87c3a16317819938f69b40913081ff4878014126042c3f4
31 [INFO] Internal load build context
32 [INFO] Transferring context: 202B
33 [INFO] [linux/arm64 builder 2/2] WORKDIR /app
34 [INFO] [linux/arm64 builder 3/2] COPY requirements.txt
35 [INFO] [linux/arm64 builder 4/2] RUN pip install --no-cache-dir -r requirements.txt
36 [INFO] [linux/arm64 builder 5/2] WORKDIR /app
37 [INFO] [linux/arm64 builder 6/2] COPY requirements.txt
38 [INFO] [linux/arm64 builder 7/2] RUN pip install --no-cache-dir -r requirements.txt
39 [INFO] [linux/arm64 builder 8/2] COPY app.py -
40 [INFO] [linux/arm64 builder 9/2] COPY --from=builder /app /app
41 [INFO] [linux/arm64 builder 10/2] COPY app.py -
42 [INFO] [linux/arm64 builder 11/2] CMD ["python", "app.py"]
43 [INFO] [linux/arm64 builder 12/2] CMD ["python", "app.py"]
44 [INFO] [linux/arm64 builder 13/2] CMD ["python", "app.py"]
45 [INFO] [linux/arm64 builder 14/2] CMD ["python", "app.py"]
46 [INFO] [linux/arm64 builder 15/2] CMD ["python", "app.py"]
47 [INFO] [linux/arm64 builder 16/2] CMD ["python", "app.py"]
48 [INFO] [linux/arm64 builder 17/2] CMD ["python", "app.py"]
49 [INFO] [linux/arm64 builder 18/2] CMD ["python", "app.py"]
50 [INFO] [linux/arm64 builder 19/2] CMD ["python", "app.py"]
51 [INFO] [linux/arm64 builder 20/2] CMD ["python", "app.py"]
52 [INFO] [linux/arm64 builder 21/2] CMD ["python", "app.py"]
53 [INFO] [linux/arm64 builder 22/2] CMD ["python", "app.py"]
54 [INFO] [linux/arm64 builder 23/2] CMD ["python", "app.py"]
55 [INFO] [linux/arm64 builder 24/2] CMD ["python", "app.py"]
56 [INFO] [linux/arm64 builder 25/2] CMD ["python", "app.py"]
57 [INFO] [linux/arm64 builder 26/2] CMD ["python", "app.py"]
58 [INFO] [linux/arm64 builder 27/2] CMD ["python", "app.py"]
59 [INFO] [linux/arm64 builder 28/2] CMD ["python", "app.py"]
60 [INFO] [linux/arm64 builder 29/2] CMD ["python", "app.py"]
61 [INFO] [linux/arm64 builder 30/2] CMD ["python", "app.py"]
62 [INFO] [linux/arm64 builder 31/2] CMD ["python", "app.py"]
63 [INFO] [linux/arm64 builder 32/2] CMD ["python", "app.py"]
64 [INFO] [linux/arm64 builder 33/2] CMD ["python", "app.py"]
65 [INFO] [linux/arm64 builder 34/2] CMD ["python", "app.py"]
66 [INFO] [linux/arm64 builder 35/2] CMD ["python", "app.py"]
67 [INFO] [linux/arm64 builder 36/2] CMD ["python", "app.py"]
68 [INFO] [linux/arm64 builder 37/2] CMD ["python", "app.py"]
69 [INFO] [linux/arm64 builder 38/2] CMD ["python", "app.py"]
70 [INFO] [linux/arm64 builder 39/2] CMD ["python", "app.py"]
71 [INFO] [linux/arm64 builder 40/2] CMD ["python", "app.py"]
72 [INFO] [linux/arm64 builder 41/2] CMD ["python", "app.py"]
73 [INFO] [linux/arm64 builder 42/2] CMD ["python", "app.py"]
74 [INFO] [linux/arm64 builder 43/2] CMD ["python", "app.py"]
75 [INFO] [linux/arm64 builder 44/2] CMD ["python", "app.py"]
76 [INFO] [linux/arm64 builder 45/2] CMD ["python", "app.py"]
77 [INFO] [linux/arm64 builder 46/2] CMD ["python", "app.py"]
78 [INFO] [linux/arm64 builder 47/2] CMD ["python", "app.py"]
79 [INFO] [linux/arm64 builder 48/2] CMD ["python", "app.py"]
80 [INFO] [linux/arm64 builder 49/2] CMD ["python", "app.py"]
81 [INFO] [linux/arm64 builder 50/2] CMD ["python", "app.py"]
82 [INFO] [linux/arm64 builder 51/2] CMD ["python", "app.py"]
83 [INFO] [linux/arm64 builder 52/2] CMD ["python", "app.py"]
84 [INFO] [linux/arm64 builder 53/2] CMD ["python", "app.py"]
85 [INFO] [linux/arm64 builder 54/2] CMD ["python", "app.py"]
86 [INFO] [linux/arm64 builder 55/2] CMD ["python", "app.py"]
87 [INFO] [linux/arm64 builder 56/2] CMD ["python", "app.py"]
88 [INFO] [linux/arm64 builder 57/2] CMD ["python", "app.py"]
89 [INFO] [linux/arm64 builder 58/2] CMD ["python", "app.py"]
90 [INFO] [linux/arm64 builder 59/2] CMD ["python", "app.py"]
91 [INFO] [linux/arm64 builder 60/2] CMD ["python", "app.py"]
92 [INFO] [linux/arm64 builder 61/2] CMD ["python", "app.py"]
93 [INFO] [linux/arm64 builder 62/2] CMD ["python", "app.py"]
94 [INFO] [linux/arm64 builder 63/2] CMD ["python", "app.py"]
95 [INFO] [linux/arm64 builder 64/2] CMD ["python", "app.py"]
96 [INFO] [linux/arm64 builder 65/2] CMD ["python", "app.py"]
97 [INFO] [linux/arm64 builder 66/2] CMD ["python", "app.py"]
98 [INFO] [linux/arm64 builder 67/2] CMD ["python", "app.py"]
99 [INFO] [linux/arm64 builder 68/2] CMD ["python", "app.py"]
100 [INFO] [linux/arm64 builder 69/2] CMD ["python", "app.py"]
101 [INFO] [linux/arm64 builder 70/2] CMD ["python", "app.py"]
102 [INFO] [linux/arm64 builder 71/2] CMD ["python", "app.py"]
103 [INFO] [linux/arm64 builder 72/2] CMD ["python", "app.py"]
104 [INFO] [linux/arm64 builder 73/2] CMD ["python", "app.py"]
105 [INFO] [linux/arm64 builder 74/2] CMD ["python", "app.py"]
106 [INFO] [linux/arm64 builder 75/2] CMD ["python", "app.py"]
107 [INFO] [linux/arm64 builder 76/2] CMD ["python", "app.py"]
108 [INFO] [linux/arm64 builder 77/2] CMD ["python", "app.py"]
109 [INFO] [linux/arm64 builder 78/2] CMD ["python", "app.py"]
110 [INFO] [linux/arm64 builder 79/2] CMD ["python", "app.py"]
111 [INFO] [linux/arm64 builder 80/2] CMD ["python", "app.py"]
112 [INFO] [linux/arm64 builder 81/2] CMD ["python", "app.py"]
113 [INFO] [linux/arm64 builder 
```

```

[sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28$ sudo docker build build --platform linux/amd64,linux/arm64 -t imabusayed/docker-assignment-icdcp-28:v1 --push
[+] Building 39.9s (19/19) FINISHED
=> [internal] load build definition from Dockerfile
=> transferring Dockerfile: 365B
=> [linux/arm64 internal] load metadata for docker.io/library/python:3.9-slim
=> [linux/amd64 internal] load metadata for docker.io/library/python:3.9-slim
=> [internal] load .dockerignore
=> transferring context: 2B
=> [linux/amd64 builder 1/5] FROM docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> resolve docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> [internal] load build context
=> transferring context: 63B
=> [linux/arm64 builder 1/5] FROM docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> resolve docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> CACHED [linux/arm64 builder 2/5] WORKDIR /app
=> CACHED [linux/arm64 builder 3/5] COPY requirements.txt
=> CACHED [linux/arm64 builder 4/5] RUN pip install --no-cache-dir -r requirements.txt
=> CACHED [linux/arm64 builder 5/5] COPY app.py
=> CACHED [linux/arm64 stage-1 3/3] COPY --from=builder /app /app
=> CACHED [linux/amd64 builder 2/5] WORKDIR /app
=> CACHED [linux/amd64 builder 3/5] COPY requirements.txt
=> CACHED [linux/amd64 builder 4/5] RUN pip install --no-cache-dir -r requirements.txt
=> CACHED [linux/amd64 builder 5/5] COPY app.py
=> CACHED [linux/amd64 stage-1 3/3] COPY --from=builder /app /app
=> exporting to image
=> exporting layers
=> exporting manifest sha256:cac752d61728c8606fe37675411d993c47f0d5ef65b7205816e0d4907c476
=> exporting config sha256:e3b744d92edd6a3ccc44e73715257e5c4ae54b1nab:2d8ed61294fe05b0e4
=> exporting attestation manifest sha256:f2cf36ab7312876cb177d2146fc4b0d82b827256017f595f4d1a0c5d7d9ab
=> exporting manifest sha256:215c599a02067278a743e9a94234a4f11594f3423c022c702f622c162c7fd
=> exporting config sha256:ec33967c6a6e71298b7b443299159a22377fc431051cc711c04c556017
=> exporting attestation manifest sha256:bba41cdc6f8fed1131c2848bcb7434f4499ec8f58a179d2be47344b7890f129
=> exporting manifest list sha256:a327dc4659020131758b417906fbfc8e0a6e4d73632ec3f38765ea2c2e1206
=> pushing layers
=> pushing manifest for docker.io/imabusayed/docker-assignment-icdcp-28:v1sha256:a327dc4659020131758b417906fbfc8e0a6e4d73632ec3f38765ea2c2e1206
[auth] imabusayed/docker-assignment-icdcp-28:v1: push token for registry-1.docker.io
[sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28$ ]

```

The screenshot shows the Visual Studio Code interface with a Dockerfile open in the editor and its build output in the terminal. The Dockerfile defines a two-stage build process for a Python Flask application. The first stage builds the application using Python 3.9-slim, and the second stage creates a minimal image by copying the application from the first stage. The terminal output shows the build process for the platform linux/amd64,linux/arm64, including layer exports and manifest pushes.

```

Dockerfile - docker-assignment-icdcp-28 - Visual Studio Code
Dockerfile
1 # Dockerfile
2
3 # Stage 1: Build Python Flask App
4 FROM python:3.9-slim AS builder
5
6 WORKDIR /app
7
8 COPY requirements.txt .
9 RUN pip install --no-cache-dir -r requirements.txt
10
11 COPY app.py .
12
13 # Stage 2: Create a minimal image
14 FROM python:3.9-slim
15
16 WORKDIR /app
17
18 COPY --from=builder /app /app
19
20 EXPOSE 5000
21
22 CMD ["python", "app.py"]

[sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28$ sudo docker build build --platform linux/amd64,linux/arm64 -t imabusayed/docker-assignment-icdcp-28:v1 --push
[+] Building 39.9s (19/19) FINISHED
=> [internal] load build definition from Dockerfile
=> transferring Dockerfile: 365B
=> [linux/arm64 internal] load metadata for docker.io/library/python:3.9-slim
=> [linux/amd64 internal] load metadata for docker.io/library/python:3.9-slim
=> [internal] load .dockerignore
=> transferring context: 2B
=> [linux/amd64 builder 1/5] FROM docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> resolve docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> [internal] load build context
=> transferring context: 63B
=> [linux/arm64 builder 1/5] FROM docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> resolve docker.io/library/python:3.9-slimsha256:c54ecbf55a7527c913aef9a9e318c83bb78bea2204be57f39b28e43ab733ab
=> CACHED [linux/arm64 builder 2/5] WORKDIR /app
=> CACHED [linux/arm64 builder 3/5] COPY requirements.txt
=> CACHED [linux/arm64 builder 4/5] RUN pip install --no-cache-dir -r requirements.txt
=> CACHED [linux/arm64 builder 5/5] COPY app.py
=> CACHED [linux/arm64 stage-1 3/3] COPY --from=builder /app /app
=> CACHED [linux/amd64 builder 2/5] WORKDIR /app
=> CACHED [linux/amd64 builder 3/5] COPY requirements.txt
=> CACHED [linux/amd64 builder 4/5] RUN pip install --no-cache-dir -r requirements.txt
=> CACHED [linux/amd64 builder 5/5] COPY app.py
=> CACHED [linux/amd64 stage-1 3/3] COPY --from=builder /app /app
=> exporting to image
=> exporting layers
=> exporting manifest sha256:cac752d61728c8606fe37675411d993c47f0d5ef65b7205816e0d4907c476
=> exporting config sha256:e3b744d92edd6a3ccc44e73715257e5c4ae54b1nab:2d8ed61294fe05b0e4
=> exporting attestation manifest sha256:f2cf36ab7312876cb177d2146fc4b0d82b827256017f595f4d1a0c5d7d9ab
=> exporting manifest sha256:215c599a02067278a743e9a94234a4f11594f3423c022c702f622c162c7fd
=> exporting config sha256:ec33967c6a6e71298b7b443299159a22377fc431051cc711c04c556017
=> exporting attestation manifest sha256:bba41cdc6f8fed1131c2848bcb7434f4499ec8f58a179d2be47344b7890f129
=> exporting manifest list sha256:a327dc4659020131758b417906fbfc8e0a6e4d73632ec3f38765ea2c2e1206
=> pushing layers
=> pushing manifest for docker.io/imabusayed/docker-assignment-icdcp-28:v1sha256:a327dc4659020131758b417906fbfc8e0a6e4d73632ec3f38765ea2c2e1206
[auth] imabusayed/docker-assignment-icdcp-28:v1: push token for registry-1.docker.io
[sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28$ ]

```

app.py - docker-assignment-icdcp-28 - Visual Studio Code

File Edit Selection View Go Run Terminal Help

EXPLORER

- app.py
- Dockerfile
- requirements.txt

DOCKERS

- DOCKER-ASSIGNMENT-ICDCP-28
  - app.py
  - Dockerfile

OUTLINE

- DOCKER-ASSIGNMENT-ICDCP-28
- DOCKER IMAGES
- DOCKER CONTAINERS
- DOCKER HUB
- SUGGESTED DOCKER HUB IMAGES

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PROBLEMS	OUTPUT	DEBUG CONSOLE	TERMINAL	PORTS
abcc6f1657fa	bitnami/phpmyadmin:latest		"/opt/bitnami/script-"	33 hours ago
3881e7644066	moby/buildkit:buildx-stable-1		"buildkit"	35 hours ago
6767881484d4	inabused/dockerassignment:latest		"python app.py"	35 hours ago
1ed36c323795	2492a501fc77		"/opt/bitnami/script-"	35 hours ago
285c6cc3af10	2492a501fc77		"/opt/bitnami/script-"	35 hours ago
3aa0127eed65	354122c2fb720		"/opt/bitnami/script-"	35 hours ago
47820ee41d12	16d18bbaccf8		"python app.py"	35 hours ago
c06239d556c7	bitnami/laravel		"/opt/bitnami/script-"	35 hours ago
0d74496d5b5f	bitnami/laravel		"/opt/bitnami/script-"	35 hours ago
218e5e7dc169	bitnami/laravel		"/opt/bitnami/script-"	35 hours ago
bee207c9d31	bitnami/laravel		"/opt/bitnami/script-"	35 hours ago
676c6c3d6d4e	inabused/dockerassignment:latest		"python app.py"	43 hours ago
0662225de90a	inabused/dockerassignment:latest		"python app.py"	44 hours ago
66454f41bfbf	inabused/dockerassignment:latest		"python app.py"	44 hours ago
be0904df6d27	inabused/dockerassignment:latest		"python app.py"	44 hours ago
496f961ced13	inabused/dockerassignment:latest		"python app.py"	44 hours ago
d3cddf70f930	moby/buildkit:buildx-stable-1		"buildkit"	2 days ago
	buildx_buildkit_agitated_galileo0			
	sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28\$ sudo docker exec -it 6b4d2d7bb9be bash pwd			
	OCI runtime exec failed: exec failed: unable to start container process: exec: "bash": executable file not found in \$PATH: unknown			
	sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28\$ sudo docker exec -it 6b4d2d7bb9be pwd			
	sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28\$ sudo docker exec -it 6b4d2d7bb9be whoami			
	root			
	sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28\$ sudo docker exec -it 6b4d2d7bb9be ls			
	bin dev etc home lib media mnt opt proc root run sbin srv sys tmp usr var			
	sayed@sayed-vm:~/Desktop/docker-assignment-icdcp-28\$			

Ln 13, Col 1 Space

3.10.12 64-bit

10:32 AM 11/22/2023