

Practical-6

Deployment of ML project using Flask.

Task 1: Ensure that the required libraries are installed

```
pip install Flask
```

```
pip install gunicorn
```

Task 2: Create the docker file using the steps described in theory material.

a) Create a Dockerfile :

```
FROM python:3.8-slim
WORKDIR /app
COPY . /app
RUN pip install --no-cache-dir -r requirements.txt
EXPOSE 80
ENV NAME World
CMD ["gunicorn", "--bind", "0.0.0.0:80", "app:app"]
```

b) Create a requirement.txt file :

```
scikit-learn==0.24.2
pandas==1.3.3
numpy==1.21.2    flask==2.1.0
gunicorn==20.1.0
```

c) Create a Docker Image :

```
[+] Building 65.7s (8/9)
=> => sha256:1fb7efcf9eab7803298874aca4438f97958ccef72e9d62bf6c7654b5d9c92c40 3.51MB / 3.51MB
=> => sha256:ec9a8be8d55c26df0ad6648b4a2cf81563a89cd042b0d16f0ab58eef2cf0e4ac 13.75MB / 13.75MB
=> => sha256:0b0ea7fc90f399b2ca372776ea4b1b7ce28c725e86a2b96066262846942c68fd 245B / 245B
=> => sha256:8b9b67f59e57ed7961ac441a98c5e7481c9ddb658dc2df313fe14931f032f1c3 3.14MB / 3.14MB
=> => extracting sha256:1f7ce2fa46ab3942feabee654933948821303a5a821789dddab2d8c3df59e227
=> => extracting sha256:1fb7efcf9eab7803298874aca4438f97958ccef72e9d62bf6c7654b5d9c92c40
=> => extracting sha256:ec9a8be8d55c26df0ad6648b4a2cf81563a89cd042b0d16f0ab58eef2cf0e4ac
=> => extracting sha256:0b0ea7fc90f399b2ca372776ea4b1b7ce28c725e86a2b96066262846942c68fd
=> => extracting sha256:8b9b67f59e57ed7961ac441a98c5e7481c9ddb658dc2df313fe14931f032f1c3
=> [internal] load build context
=> => transferring context: 752.28MB
=> [2/4] WORKDIR /app
=> [3/4] COPY . /app
=> [4/4] RUN pip install --no-cache-dir -r requirements.txt
=> => # collecting six>=1.5
=> => # Downloading six-1.16.0-py2.py3-none-any.whl (11 kB)
```

- Check the image is created or not :

```
PS D:\Capstone Project-1> docker images
```

| REPOSITORY | TAG | IMAGE ID | CREATED | SIZE |
|-------------|--------|--------------|---------------|--------|
| project | latest | 75ebfac9ab69 | 5 minutes ago | 1.23GB |
| dockerfile | latest | ee193e6cc1a7 | 12 days ago | 509MB |
| ubuntu | latest | e4c58958181a | 7 weeks ago | 77.8MB |
| hello-world | latest | 9c7a54a9a43c | 6 months ago | 13.3kB |

```
PS D:\Capstone Project-1> ls
```

| Mode | LastWriteTime | Length | Name |
|--------|---------------------|--------|-------------------------|
| d---- | 30-12-2022 11:43 PM | | .idea |
| d---- | 28-06-2023 12:40 PM | | Capstone Project-1 |
| d---- | 12-03-2023 12:11 PM | | Car Price Prediction |
| d---- | 30-06-2023 06:57 PM | | Datasets |
| d---- | 30-12-2022 07:43 PM | | Group Members |
| d---- | 07-05-2023 06:36 AM | | Laptop_Price_Prediction |
| d---- | 30-12-2022 08:13 PM | | model |
| d---- | 27-12-2022 02:54 PM | | PPT |
| d---- | 01-07-2023 07:21 PM | | README |
| d---- | 02-05-2023 12:48 PM | | Report |
| d---- | 28-06-2023 02:38 PM | | UI |
| -a---- | 13-04-2023 01:36 PM | 108 | updated |

- Locate the file app.py and start build of a project

```
PS D:\Capstone Project-1\UI> cd '..\New UI\'
PS D:\Capstone Project-1\UI\New UI> ls
```

```
Directory: D:\Capstone Project-1\UI\New UI
```

| Mode | LastWriteTime | Length | Name |
|--------|---------------------|--------|------------------|
| d---- | 23-04-2023 02:03 PM | | static |
| d---- | 07-05-2023 04:02 AM | | templates |
| -a---- | 23-11-2023 04:10 PM | 4701 | app_final.py |
| -a---- | 23-11-2023 04:24 PM | 550 | Dockerfile |
| -a---- | 23-11-2023 04:24 PM | 94 | requirements.txt |

```
PS D:\Capstone Project-1\UI\New UI> docker build -t projecta .
[+] Building 0.0s (0/0)
[+] Building 39.8s (10/10) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 589B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:3.8-slim
=> [auth] library/python:pull token for registry-1.docker.io
=> [1/4] FROM docker.io/library/python:3.8-slim@sha256:19e07fa24813e88b04e60677213bd03ba044637cc939a211e28ccf997a9162a
=> [internal] load build context
=> => transferring context: 13.14MB
```

Task 4: Run the docker container to execute the docker image and host the machine learning model using gunicorn wsgi server.

```
D:\Capstone Project-1\UI\New UI>
D:\Capstone Project-1\UI\New UI>docker run -p 4000:80 projecta
[2023-11-23 11:17:21 +0000] [1] [INFO] Starting gunicorn 20.1.0
[2023-11-23 11:17:21 +0000] [1] [INFO] Listening at: http://0.0.0.0:80 (1)
[2023-11-23 11:17:21 +0000] [1] [INFO] Using worker: sync
[2023-11-23 11:17:21 +0000] [8] [INFO] Booting worker with pid: 8
```