Practical-6

AIM: 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@sha256:19e07fa24813e88b04e606772213bd03ba044637cc939a211e28ccf997a9162a
 => [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
```