Practical - 7

AIM : Deployment of ML project using Streamlit.

Streamlit deployment within Docker in an ML lab is valuable for creating user-friendly, interactive ML applications. It combines the simplicity of Streamlit for building data apps with the containerization benefits of Docker, enabling easy sharing, reproducibility, and scalability of data-driven applications.

This approach streamlines the deployment of ML tools and enhances collaboration among researchers and stakeholders.

Task 1: Ensure that the required libraries are installed:

streamlit==1.10.0
pandas==1.2.3
scikit-learn==0.24.1

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

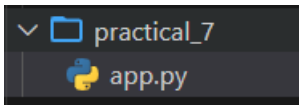
a) Create a Dockerfile :

```
# Use the official Python image as a base image
FROM python:3.8-slim

# Set the working directory inside the container
WORKDIR /app

# Copy the current directory contents into the container at /app
COPY . /app

# Install any dependencies specified in requirements.txt
RUN pip install --no-cache-dir -r requirements.txt

# Expose port 80 to the outside world
EXPOSE 80

# Set environment variable
ENV NAME World

# Define the command to run your application
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
gunicorn==20.1.0
Flask==2.0.2
Werkzeug==2.0.2
```

c) Create a Streamlit file :



d) Create a Docker Image :

```
PS D:\Desktop\stream> docker build -t stream .
[+] Building 3.1s (10/10) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 577B
 => [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
 => => transferring context: 93B
 => CACHED [2/4] WORKDIR /app
 => CACHED [4/4] RUN pip install --no-cache-dir -r requirements.txt
 => exporting to image
 => => exporting layers
 => => writing image sha256:e56ed293e3b764515644f7bb676072f8e666754267516a1758d42045027a5b2f
```

Check the image is created or not :

```
PS E:\7sem\MLOPS\practicals\wordfiles\practical_6> docker images
REPOSITORY    TAG       IMAGE ID       CREATED          SIZE
tirth         latest    a31fa280de39   45 minutes ago   477MB
<none>        <none>    0aacb8f64042   53 minutes ago   477MB
<none>        <none>    a35dc89c9460   4 hours ago      477MB
nginx         latest    a6bd71f48f68   9 days ago       187MB
```

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

```
PS E:\7sem\MLOPS\practicals\wordfiles\practical_6> docker run -p 8080:8501 stram
Collecting usage statistics. To deactivate, set browser.gatherUsageStats to False.


  You can now view your Streamlit app in your browser.

  Network URL: http://172.17.0.4:8501
  External URL: http://103.238.106.204:8501
```