Practical-7

Aim: Deployment of ML project in docker using Streamlit

Task 1: Ensure that the required libraries are installed:

- Install the Docker Command Line Interface Tool from: https://docs.docker.com/desktop/
- Install Streamlit library (https://docs.streamlit.io/library/get-started/installation)

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

Practical 7 > Dockerfile > ...

```dockerfile
# Use an official Python runtime as a parent image
FROM python:3.8-slim

# Set the working directory to /app
WORKDIR /app

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

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

# Expose the port that Streamlit will run on
EXPOSE 8501

# Run streamlit when the container launches
CMD ["streamlit", "run", "app.py"]

```

Task 3: Create the docker image using docker build command.

```
PS C:\Users\Nakul\Downloads\MLOPs\Practicals\Practical 7> docker build -t pr7 .
[+] Building 68.1s (10/10) FINISHED                                                    docker:default
 => [internal] load build definition from Dockerfile                                             0.0s
 => => transferring dockerfile: 506B                                                             0.0s
 => [internal] load .dockerignore                                                                0.0s
 => => transferring context: 2B                                                                  0.0s
 => [internal] load metadata for docker.io/library/python:3.8-slim                               2.6s
 => [auth] library/python:pull token for registry-1.docker.io                                    0.0s
 => [1/4] FROM docker.io/library/python:3.8-slim@sha256:3cb3ea0dfa00f89921c9e780618c515a7cbb5f0e0c531dc9b657cf9f155f3a66  0.0s
 => [internal] load build context                                                                0.0s
 => => transferring context: 1.49kB                                                              0.0s
 => CACHED [2/4] WORKDIR /app                                                                    0.0s
 => [3/4] COPY . /app                                                                            0.0s
 => [4/4] RUN pip install --no-cache-dir -r requirements.txt                                    63.1s
 => exporting to image                                                                           2.3s
 => => exporting layers                                                                          2.2s
 => => writing image sha256:24a84f04ed1eae341c5b47e8b0cf1491a0899e977a1573185b7b8d3fddc8393c     0.0s
 => => naming to docker.io/library/pr7                                                           0.0s

What's Next?
  View a summary of image vulnerabilities and recommendations → docker scout quickview
```

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

```
PS C:\Users\Nakul\Downloads\MLOPs\Practicals\Practical 7> docker images
REPOSITORY                                                        TAG       IMAGE ID       CREATED          SIZE
pr7                                                               latest    24a84f04ed1e   5 minutes ago    653MB
```

```
PS C:\Users\Nakul\Downloads\MLOPs\Practicals\Practical 7> docker run -p 8501:8501 pr7

Collecting usage statistics. To deactivate, set browser.gatherUsageStats to False.


  You can now view your Streamlit app in your browser.

  Network URL: http://172.17.0.2:8501
  External URL: http://103.85.8.34:8501
```

Task 5: Compare the performance of the model in docker container and streamlit deployment on local server.

If the response time is a critical factor for your application, achieving a lower response time in the Docker container is a positive outcome. You may also want to consider running more extensive tests, including load testing, to assess how well each deployment scenario handles varying workloads.

If you have specific criteria or additional metrics you'd like to evaluate, feel free to provide more details, and I can offer further guidance.