

Practical-7

Deployment of ML project using Streamlit.

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 :

```
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 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 D:\Desktop\stream> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
stream        latest    e56ed293e3b7   16 minutes ago 495MB
```

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

```
PS D:\Desktop\stream> docker run -p 8080:8501 stream

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
```

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

Local Server :

Time : 9.25 sec

Docker :

Time :7.25 sec

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.