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Task:

Peter is a developer and currently he requires a containerised environment. He needs a python environment in which pandas, numpy, seaborn and sklearn are installed for specified versions and he also requires a conformation message to be displayed on the console showing that specified versions of the dependencies have been sucessfully installed. The containerized environment should be running in the background. Another constraint is that the only port available on the host side is "7059".

following are the specified version for libraries.

1. Pandas:

Version 1.2.2

2. NumPy:

Version 1.18.5

3. Seaborn:

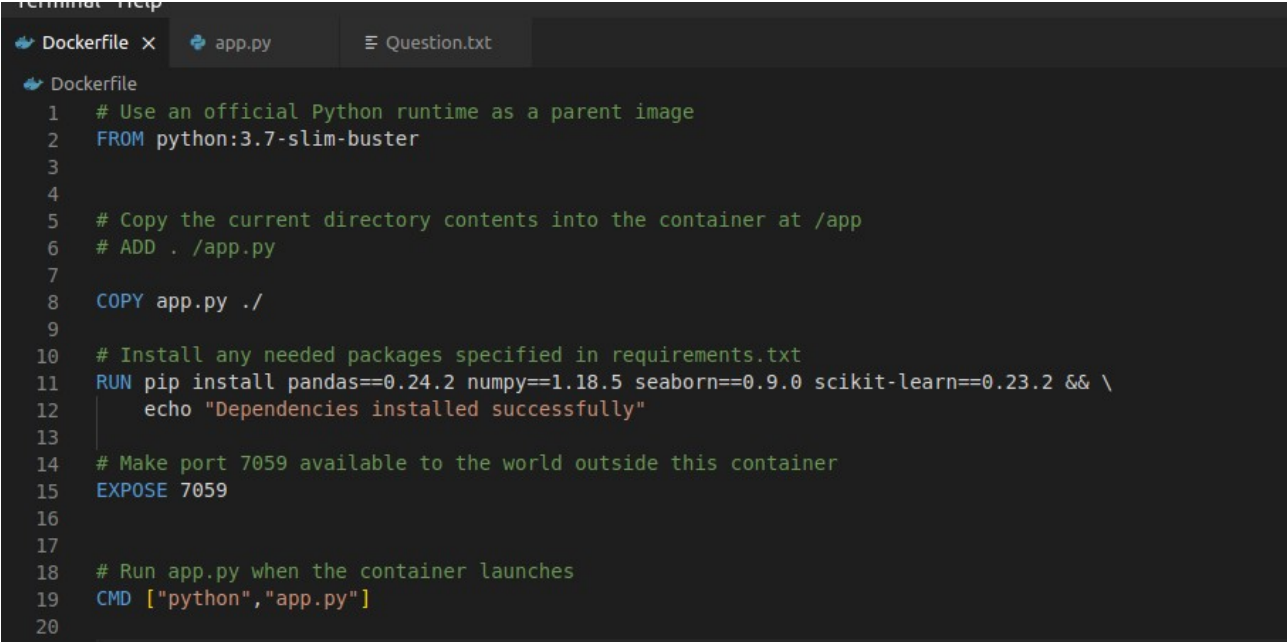
Version 0.9.0

4. Scikit-learn:

Version 0.23.2PS : Ensure best practices are followed and containerized environment should be persistent

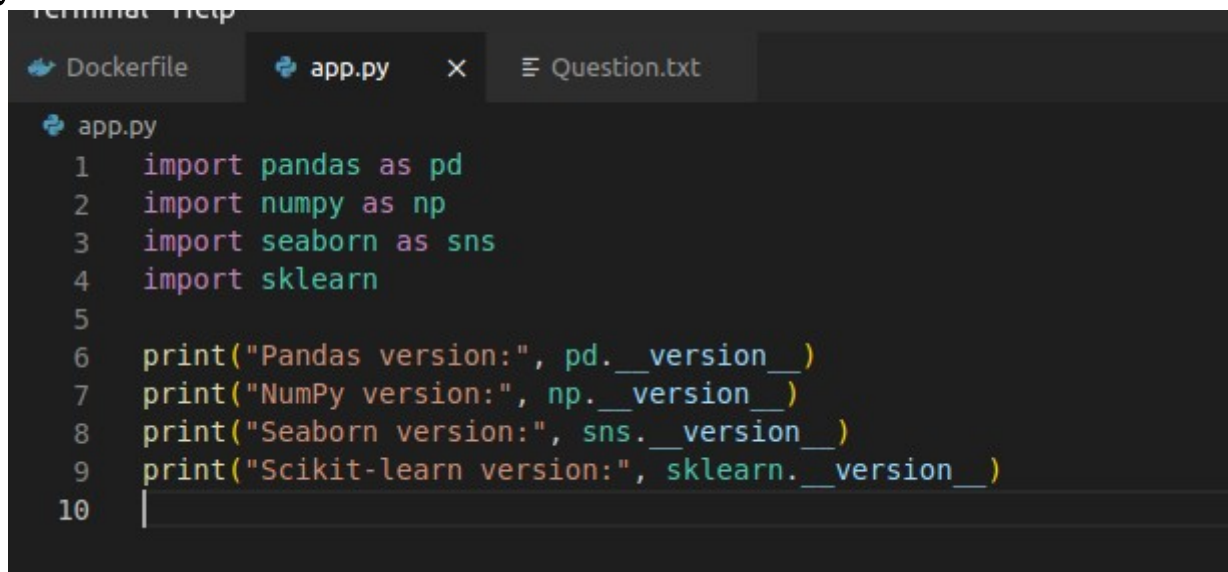
Answer:

Dockerfile



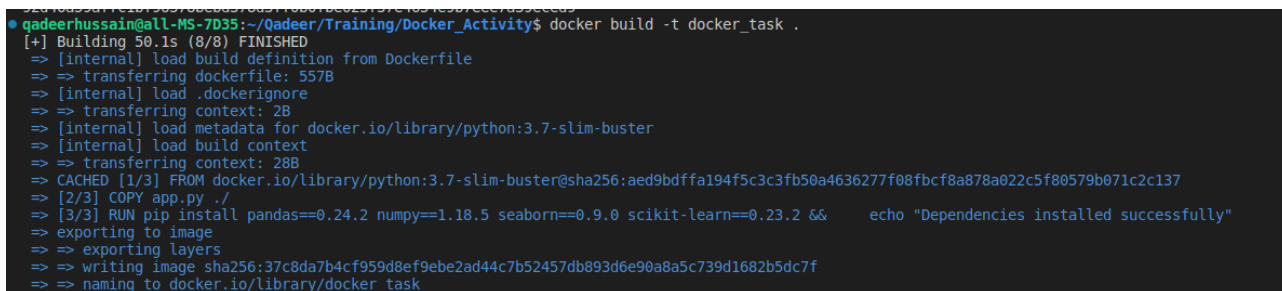
```
1 # Use an official Python runtime as a parent image
2 FROM python:3.7-slim-buster
3
4
5 # Copy the current directory contents into the container at /app
6 # ADD . /app.py
7
8 COPY app.py ./
9
10 # Install any needed packages specified in requirements.txt
11 RUN pip install pandas==0.24.2 numpy==1.18.5 seaborn==0.9.0 scikit-learn==0.23.2 && \
12     echo "Dependencies installed successfully"
13
14 # Make port 7059 available to the world outside this container
15 EXPOSE 7059
16
17
18 # Run app.py when the container launches
19 CMD ["python","app.py"]
20
```

python file

A screenshot of a code editor with a dark theme. The editor has three tabs at the top: 'Dockerfile', 'app.py', and 'Question.txt'. The 'app.py' tab is active, showing a Python script. The script imports pandas, numpy, seaborn, and sklearn, and then prints their versions. The line numbers 1 through 10 are visible on the left side of the code.

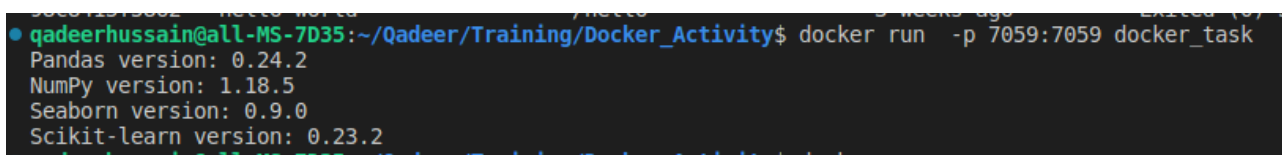
```
1 import pandas as pd
2 import numpy as np
3 import seaborn as sns
4 import sklearn
5
6 print("Pandas version:", pd.__version__)
7 print("NumPy version:", np.__version__)
8 print("Seaborn version:", sns.__version__)
9 print("Scikit-learn version:", sklearn.__version__)
10
```

Image Build : `docker build -t docker_task .`

A screenshot of a terminal window showing the output of the 'docker build' command. The prompt is 'qadeerhussain@all-MS-7D35:~/Qadeer/Training/Docker_Activity\$'. The output shows the build process, including downloading the base image, copying the app.py file, and installing dependencies. The final output is 'naming to docker.io/library/docker_task'.

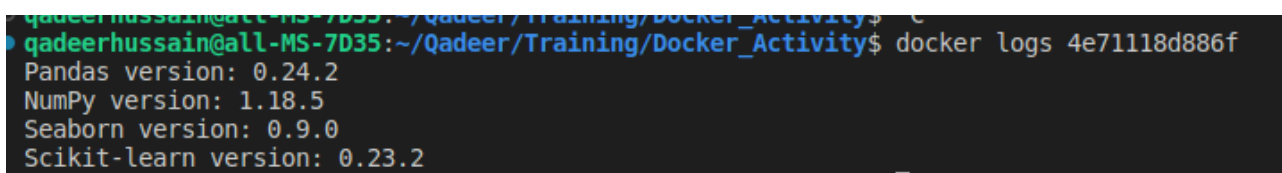
```
qadeerhussain@all-MS-7D35:~/Qadeer/Training/Docker_Activity$ docker build -t docker_task .
[+] Building 50.1s (8/8) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 557B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:3.7-slim-buster
=> [internal] load build context
=> => transferring context: 28B
=> CACHED [1/3] FROM docker.io/library/python:3.7-slim-buster@sha256:aed9bdfa194f5c3c3fb50a4636277f08fbcf8a878a022c5f80579b071c2c137
=> [2/3] COPY app.py ./
=> [3/3] RUN pip install pandas==0.24.2 numpy==1.18.5 seaborn==0.9.0 scikit-learn==0.23.2 && echo "Dependencies installed successfully"
=> exporting to image
=> exporting layers
=> writing image sha256:37c8da7b4cf959d8ef9ebe2ad44c7b52457db893d6e90a8a5c739d1682b5dc7f
=> naming to docker.io/library/docker_task
```

Run Image : `docker run -p 7059:7059 docker_task`

A screenshot of a terminal window showing the output of the 'docker run' command. The prompt is 'qadeerhussain@all-MS-7D35:~/Qadeer/Training/Docker_Activity\$'. The output shows the version information for pandas, numpy, seaborn, and sklearn, which matches the output of the 'docker build' command.

```
qadeerhussain@all-MS-7D35:~/Qadeer/Training/Docker_Activity$ docker run -p 7059:7059 docker_task
Pandas version: 0.24.2
NumPy version: 1.18.5
Seaborn version: 0.9.0
Scikit-learn version: 0.23.2
```

Run image use docker logs : `docker logs 4e71118d886f`

A screenshot of a terminal window showing the output of the 'docker logs' command. The prompt is 'qadeerhussain@all-MS-7D35:~/Qadeer/Training/Docker_Activity\$'. The output shows the version information for pandas, numpy, seaborn, and sklearn, which matches the output of the 'docker run' command.

```
qadeerhussain@all-MS-7D35:~/Qadeer/Training/Docker_Activity$ docker logs 4e71118d886f
Pandas version: 0.24.2
NumPy version: 1.18.5
Seaborn version: 0.9.0
Scikit-learn version: 0.23.2
```