Assignment 06

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Q1

Create a python program that takes 2 numbers from the user and displays addition and multiplication result. Now create an image of this program. Run the container from this image and display the results.

Mkdir app

cd app

Product.py

sudo nano product.py

```
# Python Program to add and multiply two numbers
def main():
    num1 = float(input("Enter the first number: "))
    num2 = float(input("Enter the second number: "))

    addition_result = num1 + num2
    multiplication_result = num1 * num2

    print(f"The sum of {num1} and {num2} is: {addition_result}")
    print(f"The product of {num1} and {num2} is: {multiplication_result}")

if __name__ == "__main__":
    main()
```

DockerFile
sudo Dockerfile

```
  GNU nano 6.2                Dockerfile
# Use an official Python runtime as a base image
FROM python:3.9-slim

# Set the working directory inside the container
WORKDIR /app

# Copy the Python script into the container
COPY Product.py /app/Product.py

# Install any dependencies (if needed)
# RUN pip install --no-cache-dir <package-name>

# Set the command to run the Python program
```

CMD ["python", "Product.py"]

Step 3: Build the Docker Image

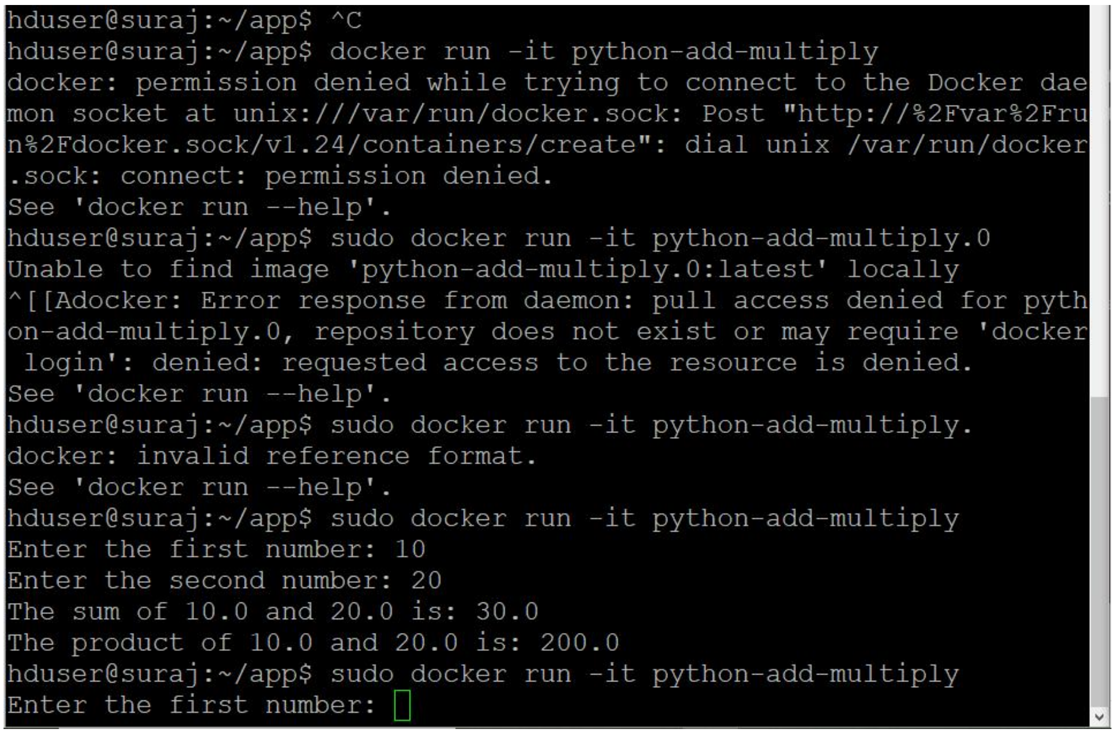
docker build -t python-add-multiply .

check

Sudo hduser@suraj:~/app$ sudo docker images ls

Step 4: Run the Docker Container

sudo **docker run -it python-add-multiply**



```
hduser@suraj:~/app$ ^C
hduser@suraj:~/app$ docker run -it python-add-multiply
docker: permission denied while trying to connect to the Docker dae
mon socket at unix:///var/run/docker.sock: Post "http://%2Fvar%2Fru
n%2Fdocker.sock/v1.24/containers/create": dial unix /var/run/docker
.sock: connect: permission denied.
See 'docker run --help'.
hduser@suraj:~/app$ sudo docker run -it python-add-multiply.0
Unable to find image 'python-add-multiply.0:latest' locally
^[[Adocker: Error response from daemon: pull access denied for pyth
on-add-multiply.0, repository does not exist or may require 'docker
 login': denied: requested access to the resource is denied.
See 'docker run --help'.
hduser@suraj:~/app$ sudo docker run -it python-add-multiply.
docker: invalid reference format.
See 'docker run --help'.
hduser@suraj:~/app$ sudo docker run -it python-add-multiply
Enter the first number: 10
Enter the second number: 20
The sum of 10.0 and 20.0 is: 30.0
The product of 10.0 and 20.0 is: 200.0
hduser@suraj:~/app$ sudo docker run -it python-add-multiply
Enter the first number: 
```

Q2

Cteate a directory. Create an index.html file. Create a image using httpd image. Copy index.html
inside the container. Run the container and map port 8200 using your image and display the webpage
is displayed.

mkdir my-webpage
# Create a directory called "my-webpage"

cd my-webpage
 # Navigate into the "my-webpage" directory

nano index.html
  # Open the "index.html" file in nano editor to create/edit it

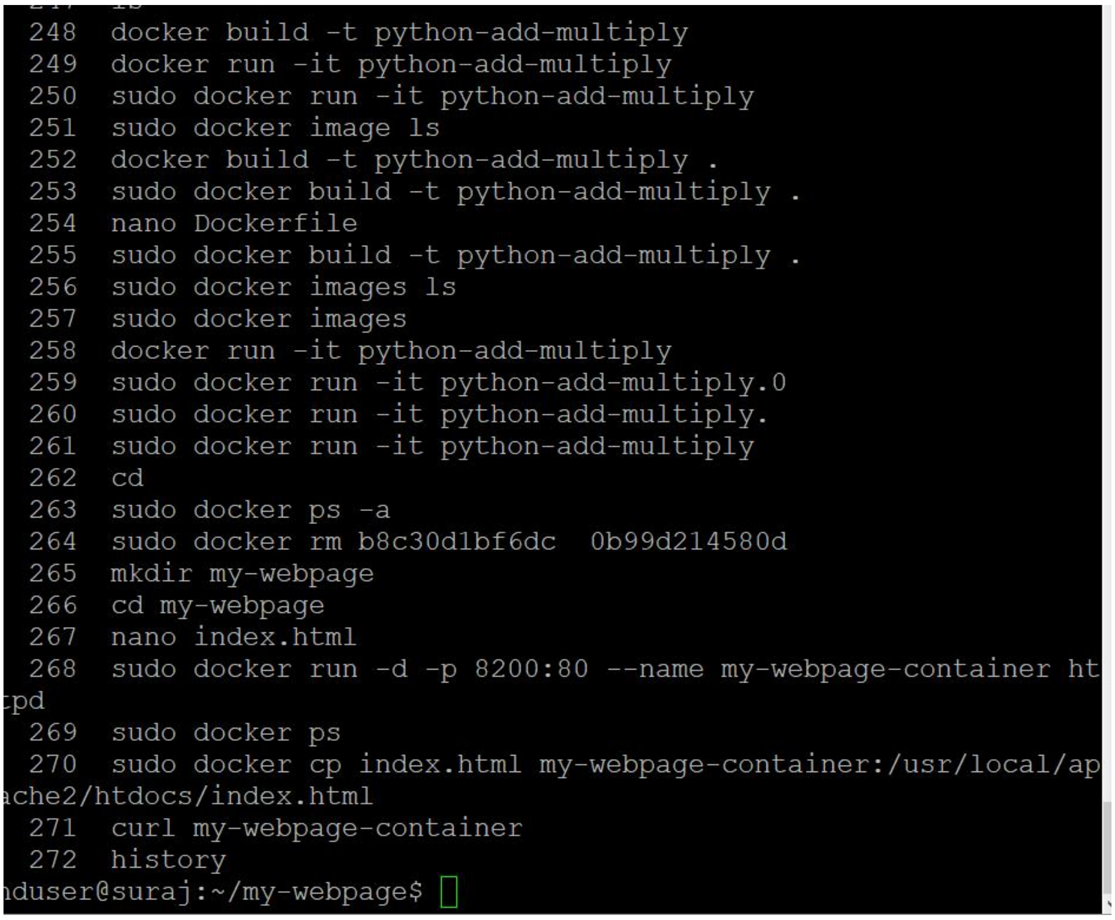
sudo docker run -d -p 8200:80 --name my-webpage-container httpd

 # Run a Docker container with Apache (httpd), map port 8200 to 80, and name it "my-webpage-container"

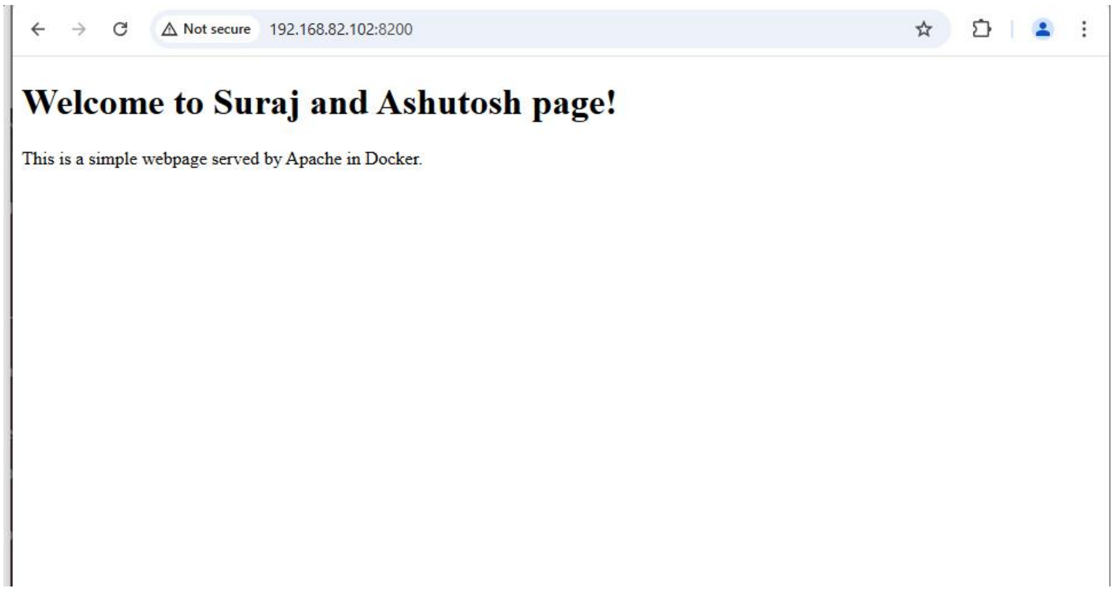
sudo docker ps
# List running Docker containers to confirm the container is running

sudo docker cp index.html my-webpage-container:/usr/local/apache2/htdocs/index.html
 # Copy "index.html" to the container's web directory

curl my-webpage-container
 # Try to use curl to access the container



```
 248  docker build -t python-add-multiply
 249  docker run -it python-add-multiply
 250  sudo docker run -it python-add-multiply
 251  sudo docker image ls
 252  docker build -t python-add-multiply .
 253  sudo docker build -t python-add-multiply .
 254  nano Dockerfile
 255  sudo docker build -t python-add-multiply .
 256  sudo docker images ls
 257  sudo docker images
 258  docker run -it python-add-multiply
 259  sudo docker run -it python-add-multiply.0
 260  sudo docker run -it python-add-multiply.
 261  sudo docker run -it python-add-multiply
 262  cd
 263  sudo docker ps -a
 264  sudo docker rm b8c30d1bf6dc  0b99d214580d
 265  mkdir my-webpage
 266  cd my-webpage
 267  nano index.html
 268  sudo docker run -d -p 8200:80 --name my-webpage-container ht
tpd
 269  sudo docker ps
 270  sudo docker cp index.html my-webpage-container:/usr/local/ap
ache2/htdocs/index.html
 271  curl my-webpage-container
 272  history
nduser@suraj:~/my-webpage$
```



Welcome to Suraj and Ashutosh page!

This is a simple webpage served by Apache in Docker.

Q3

Create a image of the test.py file. Create a network by name app2. Create a MYSQL container and
connect it to this network. Now create a container of test.py application and connect it to the same
network and display that the database is created.

```
# Create a custom network
Sudo docker network create app2
```

# Run a MySQL container connected to the app2 network

```
Sudo docker run --name mysql-container --network app2 -e
MYSQL_ROOT_PASSWORD=root -e MYSQL_DATABASE=testdb -d
mysql:latest
```

Dockerfile

```
FROM python:3.9-slim
WORKDIR /app
COPY . /app
RUN pip install mysql-connector-python
CMD ["python", "test.py"]
```

test.py

```
import mysql.connector
import os

MYSQL_HOST = os.getenv("MYSQL_HOST", "mysql-container")
# Get the MySQL host from environment variables or use the default "mysql-container"

MYSQL_USER = os.getenv("MYSQL_USER", "root")
# Get the MySQL user from environment variables or use the default "root"

MYSQL_PASSWORD = os.getenv("MYSQL_PASSWORD", "root")
# Get the MySQL password from environment variables or use the default "root"

MYSQL_DB = os.getenv("MYSQL_DB", "testdb")
# Get the MySQL database name from environment variables or use the default "testdb"

connection = mysql.connector.connect(
    host=MYSQL_HOST,
    user=MYSQL_USER,
    password=MYSQL_PASSWORD,
    database=MYSQL_DB
)
# Connect to the MySQL server using the provided credentials and database
```

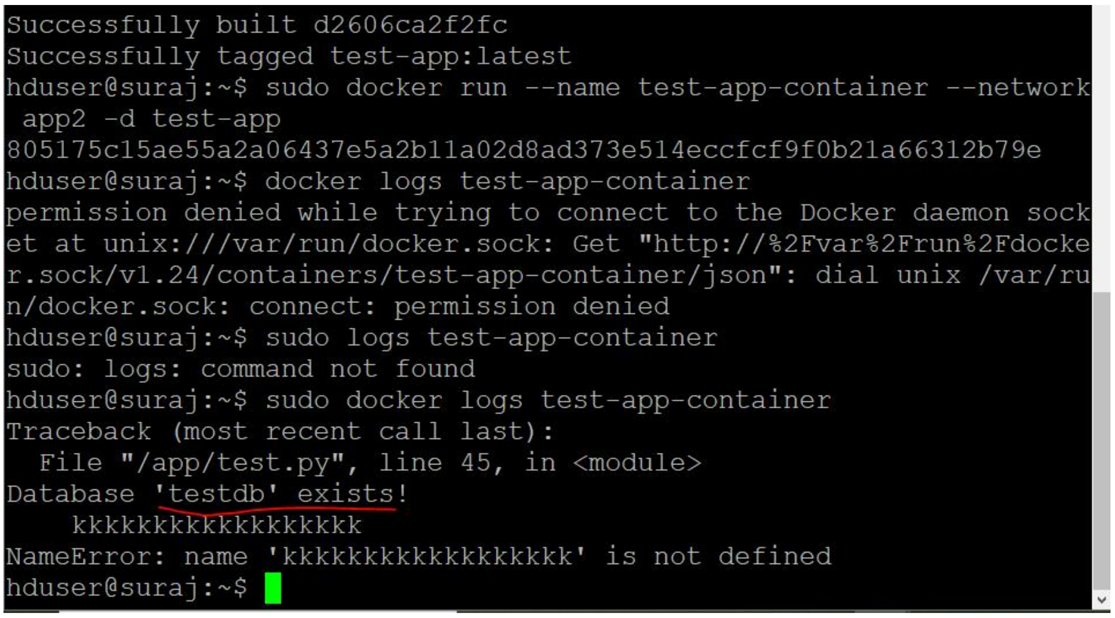
```
cursor = connection.cursor()
# Create a cursor to execute SQL queries

cursor.execute("SHOW DATABASES LIKE %s", (MYSQL_DB,))
# Query to check if the specified database exists

db = cursor.fetchone()
# Fetch the result of the query, will return None if no match is found

if db:
    print(f"Database '{MYSQL_DB}' exists!")
    # If the database exists, print a success message

else:
    print(f"Database '{MYSQL_DB}' does not exist!")
    # If the database doesn't exist, print an error message

cursor.close()
# Close the cursor to release database resources

connection.close()
# Close the database connection to clean up
```

3. **Build and Run the Python App Container**

```
# Build the Python app Docker image
 sudo docker build -t test-app .

# Run the Python app container connected to the same network

sudo docker run --name test-app-container --network app2 -d test-app
```

4. **Checking the Logs**

sudo docker logs test-app-container



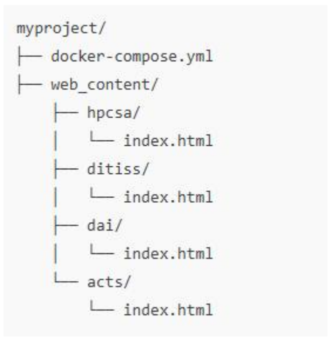
```
Successfully built d2606ca2f2fc
Successfully tagged test-app:latest
hduser@suraj:~$ sudo docker run --name test-app-container --network
 app2 -d test-app
805175c15ae55a2a06437e5a2b11a02d8ad373e514eccfcf9f0b21a66312b79e
hduser@suraj:~$ docker logs test-app-container
permission denied while trying to connect to the Docker daemon sock
et at unix:///var/run/docker.sock: Get "http://%2Fvar%2Frun%2Fdocke
r.sock/v1.24/containers/test-app-container/json": dial unix /var/ru
n/docker.sock: connect: permission denied
hduser@suraj:~$ sudo logs test-app-container
sudo: logs: command not found
hduser@suraj:~$ sudo docker logs test-app-container
Traceback (most recent call last):
  File "/app/test.py", line 45, in <module>
Database 'testdb' exists!
    kkkkkkkkkkkkkkkkkk
NameError: name 'kkkkkkkkkkkkkkkkkk' is not defined
hduser@suraj:~$
```

Q 4.
Create a docker compose file to start 4 containers using httpd image. Map ports 5000, 6000, 7000 and 8000. Port 8000 website should display "Welcome to ACTS". Port 5000 should display "Welcome to HPCSA". Port 6000 should display "Welcome to DITISS" and port 7000 should display "Welcome to DAI". Use docker-compose command.

```
     mkdir myproject
 213  sudo nano compose.yml
 214  mkdir web_content
 215  mv compose.yml myproject
 216  cd web_content
 217  mkdir hpcsa
 218  cd hpcsa
 219  mkdir index.html
 220  nano index.html
 221  ls
 222  sudo rm -rm index.html
 223  sudo rm -rf index.html
 224  nano index.html
 225  cd .
 226  mkdir ditiss
 227  cd ditiss
 228  index.html
 229  nano index.html
```

```
230  cd .
231  clear
232  ls
233  cd
234  ls
235  sudo rm -rf myproject
236  ls
237  clear
238  mkdir myproject/
239  cd myproject/
240  sudo nano docker-compose.yml
241  mkdir web_content
242  cd web_content/
243  mkdir hpcsa
244  cd hpcsa
245  sudo nano index.html
246  cd ..
247  mkdir ditiss
248  cd ditiss/
249  sudo nano index.html
250  cd ..
251  mkdir dai
252  cd dai
253  sudo index.html
254  sudo nano index.html
255  cd ..
256  mkdir acts
257  cd acts
258  sudo nano index.html
259  docker-compose up -d
260  snap install docker
261  sud snap install docker
262  sudo apt  install docker-compose
```

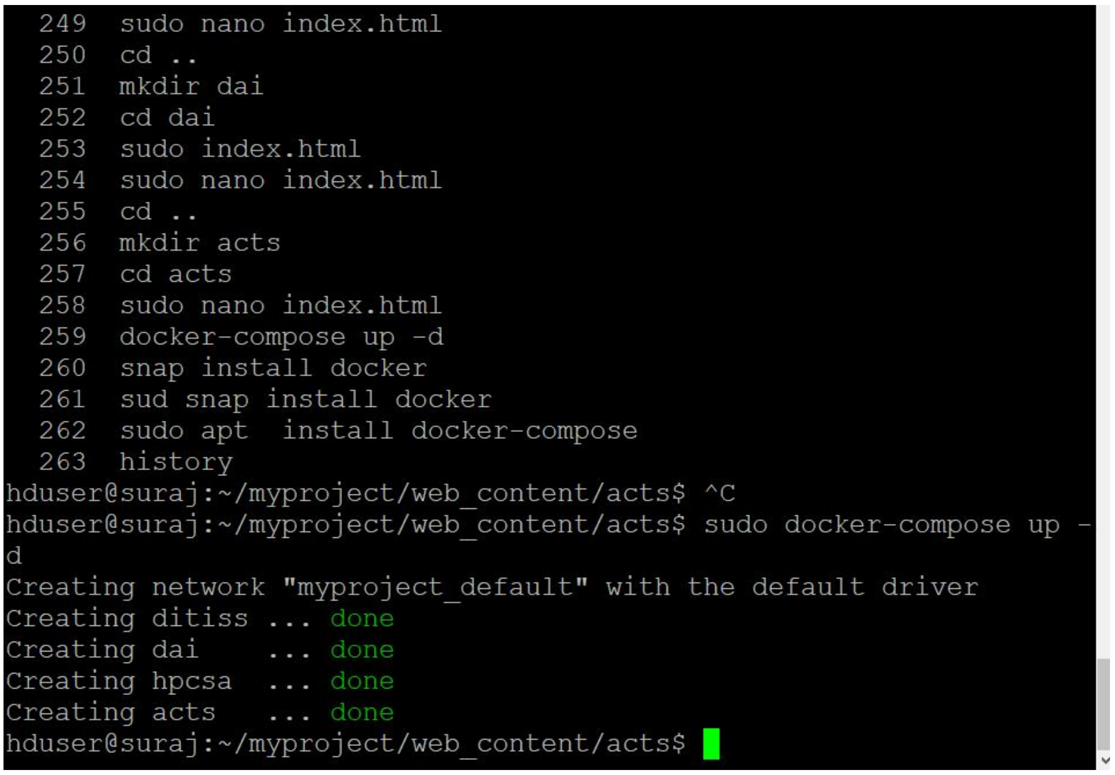
docker-compose up -d



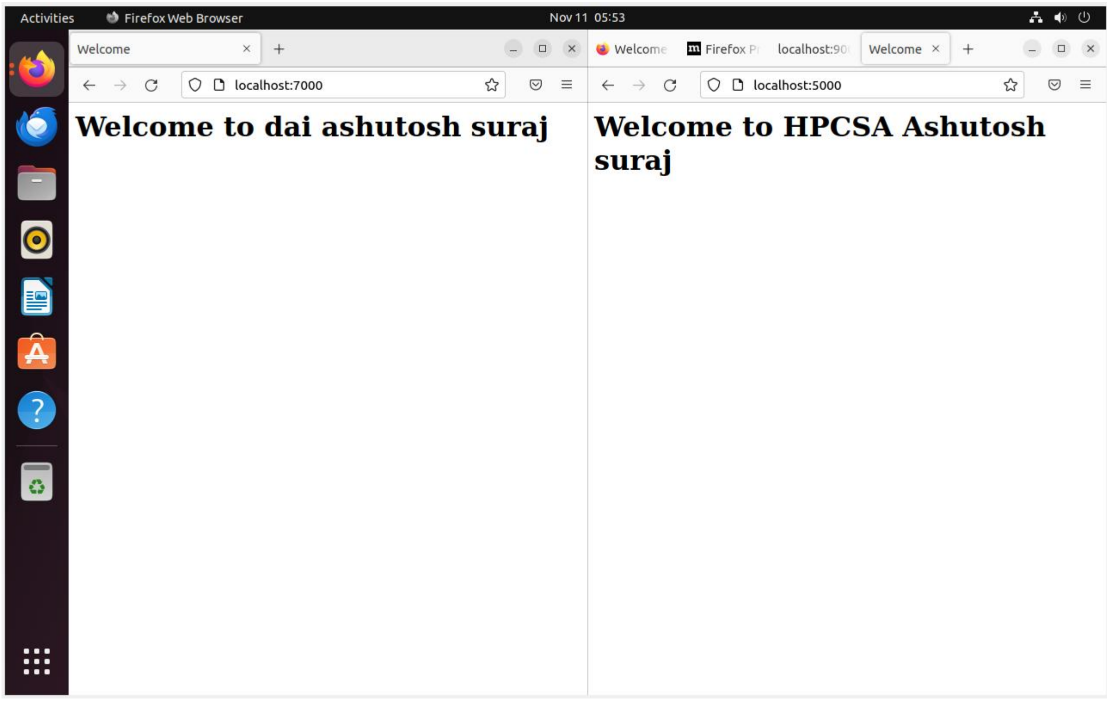
```
myproject/
├── docker-compose.yml
├── web_content/
    ├── hpcsa/
    │   └── index.html
    ├── ditiss/
    │   └── index.html
    ├── dai/
    │   └── index.html
    └── acts/
        └── index.html
```

Yaml file

```yaml
version: '3.8'

services:

  hpcsa:
    image: httpd:latest
    container_name: hpcsa
    ports:
      - "5000:80"
    volumes:
      - ./web_content/hpcsa:/usr/local/apache2/htdocs/

  ditiss:
    image: httpd:latest
    container_name: ditiss
    ports:
      - "6000:80"
    volumes:
      - ./web_content/ditiss:/usr/local/apache2/htdocs/

  dai:
    image: httpd:latest
    container_name: dai
    ports:
      - "7000:80"
    volumes:
      - ./web_content/dai:/usr/local/apache2/htdocs/

  acts:
    image: httpd:latest
    container_name: acts
    ports:
      - "8000:80"
    volumes:
      - ./web_content/acts:/usr/local/apache2/htdocs/
```



```
  249  sudo nano index.html
  250  cd ..
  251  mkdir dai
  252  cd dai
  253  sudo index.html
  254  sudo nano index.html
  255  cd ..
  256  mkdir acts
  257  cd acts
  258  sudo nano index.html
  259  docker-compose up -d
  260  snap install docker
  261  sud snap install docker
  262  sudo apt  install docker-compose
  263  history
hduser@suraj:~/myproject/web_content/acts$ ^C
hduser@suraj:~/myproject/web_content/acts$ sudo docker-compose up -
d
Creating network "myproject_default" with the default driver
Creating ditiss ... done
Creating dai    ... done
Creating hpcsa  ... done
Creating acts   ... done
hduser@suraj:~/myproject/web_content/acts$ 
```



Welcome to dai ashutosh suraj

Welcome to HPCSA Ashutosh suraj