Name-Suraj Kumar
PNR no.-240840127041

1. Create a container using httpd image. Map outside port 6500 to the container. Create an index.html file that displays your name. Copy the index.html inside the container. Display that your name is shown when you access the website.

1. Create a container using the Ubuntu image
2. Install Python inside the container
3. Save the container as an image
4. Delete the earlier container
5. Create a new container using the saved image
6. Run Python inside the new container

```
hduser@suraj: ~                                                                                    –  □  ×
duser@suraj:~$ docker run --name webserver -d -p 6500:80 httpd
f0df84adb927eba30c9073a341075ff8e2c2a8d78df63f12cfc08e45e91eb12
duser@suraj:~$ docker ps
ONTAINER ID   IMAGE     COMMAND             CREATED        STATUS        PORTS                                      NAMES
f0df84adb92   httpd     "httpd-foreground"  4 seconds ago  Up 2 seconds  0.0.0.0:6500->80/tcp, :::6500->80/tcp      webserver
duser@suraj:~$ ls
esktop  Documents  Downloads  index.html  Music  my_website  Pictures  projects  Public  snap  Videos
duser@suraj:~$ nano index.html
duser@suraj:~$ docker cp index.html webserver:/usr/local/apache2/htdocs/index.html
uccessfully copied 2.05kB to webserver:/usr/local/apache2/htdocs/index.html
duser@suraj:~$ curl http://localhost:6500
html><body><h1>My name is Suraj kumar</h1></body></html>
duser@suraj:~$
```

My name is Suraj kumar

2. Create a directory on the local file system. Create an index.html file inside this directory. Create a container using httpd image and map this directory to the container. Also map port 8500 to the container. Display the original message accessing the website. Modify the index.html file in the directory. Access the website and display that modified contents are displayed on the website.

Create 10 containers mapped to the same directory. Assign ports from 8510 to 8520. Display that all websites show the same content.

```
hduser@suraj:~$ ls
Desktop  Documents  Downloads  index.html  Music  my_website  Pictures  projects  Public  snap  Videos
hduser@suraj:~$ mkdir assignment5
hduser@suraj:~$ cd assignment5/
hduser@suraj:~/assignment5$ nano index.html
hduser@suraj:~/assignment5$ docker run --name webserver -d -p 8500:80 -v $(pwd):/usr/local/apache2/htdocs httpd
319fea9d1b8c24535907bd6337e6df1d19aa13caf382a22bc888d11e0987a103
hduser@suraj:~/assignment5$ curl http://localhost:8500
This is Suraj Kumar.
hduser@suraj:~/assignment5$ for i in {8510..8520};do
> docker run --name webserver_$i -d -p $i:80 -v $(pwd):/usr/local/apache2/htdocs httpd
> done
0341acc238fd824892fc7c22c2aaf271c3fad3852a994206363786864ef5a70d
431dd3af84e3f76ef62093d5f17ac3cb8fad9fd96ebcd1c3915edbc3edaf06a6
8627b2aa5fd0635da5aaedae00818429de546d7ee0e93371f8afd5d4707e5fa1
91780f250809be404a849c0d2eaadf5df9c6bd2b2aa406db91a10981f525e458
534e0f5a6e4342feb0b4448bc7cd9d92e06e1ffcf60956fce3ea6d47636537a3
366a97776c524651a7807dd6ea723f0649b1fa2ad8f0fd543c4534e13554f8c4
59c0a2db4b841deaa5149296f993e53e7cfd9b2963b43350a3a3cea49d3c6129
d36876474298f0472c58b97c9c24d66042de053ac149a19946ad6c5231c616c6
20cb42a295b1f91e8ab2520e8f13e57ba56054dc13e63db17361776600858cf9
5ce36ca1bc16ce4fffaf00e2fd2959576470ba3c934655975953cf783fb4d18d
170ce18533795bf941bf4ba45774c9910b346bebe5d5c6213cfda949734e4b3d
hduser@suraj:~/assignment5$ docker ps -a
CONTAINER ID   IMAGE    COMMAND              CREATED          STATUS          PORTS                                           NAMES
170ce1853379   httpd    "httpd-foreground"   16 seconds ago   Up 15 seconds   0.0.0.0:8520->80/tcp, :::8520->80/tcp         webserver_8520
5ce36ca1bc16   httpd    "httpd-foreground"   16 seconds ago   Up 15 seconds   0.0.0.0:8519->80/tcp, :::8519->80/tcp         webserver_8519
20cb42a295b1   httpd    "httpd-foreground"   17 seconds ago   Up 16 seconds   0.0.0.0:8518->80/tcp, :::8518->80/tcp         webserver_8518
d36876474298   httpd    "httpd-foreground"   18 seconds ago   Up 16 seconds   0.0.0.0:8517->80/tcp, :::8517->80/tcp         webserver_8517
59c0a2db4b84   httpd    "httpd-foreground"   18 seconds ago   Up 17 seconds   0.0.0.0:8516->80/tcp, :::8516->80/tcp         webserver_8516
366a97776c52   httpd    "httpd-foreground"   19 seconds ago   Up 18 seconds   0.0.0.0:8515->80/tcp, :::8515->80/tcp         webserver_8515
534e0f5a6e43   httpd    "httpd-foreground"   19 seconds ago   Up 18 seconds   0.0.0.0:8514->80/tcp, :::8514->80/tcp         webserver_8514
91780f250809   httpd    "httpd-foreground"   20 seconds ago   Up 19 seconds   0.0.0.0:8513->80/tcp, :::8513->80/tcp         webserver_8513
8627b2aa5fd0   httpd    "httpd-foreground"   21 seconds ago   Up 20 seconds   0.0.0.0:8512->80/tcp, :::8512->80/tcp         webserver_8512
431dd3af84e3   httpd    "httpd-foreground"   21 seconds ago   Up 20 seconds   0.0.0.0:8511->80/tcp, :::8511->80/tcp         webserver_8511
0341acc238fd   httpd    "httpd-foreground"   22 seconds ago   Up 21 seconds   0.0.0.0:8510->80/tcp, :::8510->80/tcp         webserver_8510
319fea9d1b8c   httpd    "httpd-foreground"   3 minutes ago    Up 3 minutes    0.0.0.0:8500->80/tcp, :::8500->80/tcp         webserver
```

```
366a97776c52   httpd    "httpd-foreground"   19 seconds ago   Up 18 seconds   0.0.0.0:8515->80/tcp, :::8515->80/tcp         webserver_8515
534e0f5a6e43   httpd    "httpd-foreground"   19 seconds ago   Up 18 seconds   0.0.0.0:8514->80/tcp, :::8514->80/tcp         webserver_8514
91780f250809   httpd    "httpd-foreground"   20 seconds ago   Up 19 seconds   0.0.0.0:8513->80/tcp, :::8513->80/tcp         webserver_8513
8627b2aa5fd0   httpd    "httpd-foreground"   21 seconds ago   Up 20 seconds   0.0.0.0:8512->80/tcp, :::8512->80/tcp         webserver_8512
431dd3af84e3   httpd    "httpd-foreground"   21 seconds ago   Up 20 seconds   0.0.0.0:8511->80/tcp, :::8511->80/tcp         webserver_8511
0341acc238fd   httpd    "httpd-foreground"   22 seconds ago   Up 21 seconds   0.0.0.0:8510->80/tcp, :::8510->80/tcp         webserver_8510
319fea9d1b8c   httpd    "httpd-foreground"   3 minutes ago    Up 3 minutes    0.0.0.0:8500->80/tcp, :::8500->80/tcp         webserver
hduser@suraj:~/assignment5$ curl http://localhost:8520
This is Suraj Kumar.
hduser@suraj:~/assignment5$ curl http://localhost:8511
This is Suraj Kumar.
hduser@suraj:~/assignment5$ nano index.html
hduser@suraj:~/assignment5$ nano index.html
hduser@suraj:~/assignment5$ curl http://localhost:8511
This is Suraj Kumar.
This is modified Version.
hduser@suraj:~/assignment5$
```

This is Suraj Kumar. This is modified Version.

3. Create a network by name hpcsa in docker. Run a mysql container and attach it to this network. Keep the name of the mysql container as dbserver. The root password should be "pass@123". Not create a python container and run the test.py script and create a database by name students. And create a table by name batch24. Display the output of the script.


```
hduser@suraj: ~/assignment5
hduser@suraj:~/assignment5$ nano test.py
hduser@suraj:~/assignment5$ nano Dockerfile
hduser@suraj:~/assignment5$ nano test.py
hduser@suraj:~/assignment5$ docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
66b030d620c0   bridge    bridge    local
736ce5850c52   host      host      local
0b9e946edc6a   hpcsa     bridge    local
0cad090f8e5e   none      null      local
hduser@suraj:~/assignment5$ docker images
REPOSITORY           TAG       IMAGE ID       CREATED        SIZE
python-with-python3  latest    5c058a339d2a   4 hours ago    161MB
python               3.9       24e94023d809   3 weeks ago    999MB
mysql                latest    10db11fef9ce   3 weeks ago    602MB
ubuntu               latest    59ab366372d5   4 weeks ago    78.1MB
httpd                latest    1bcf11fa154f   3 months ago   148MB
hduser@suraj:~/assignment5$ docker run --name dbserver --network hpcsa -e MYSQL_ROOT_PASSWORD=pass@123 mysql
2024-11-11 06:27:21+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 9.1.0-1.el9 started.
2024-11-11 06:27:23+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
2024-11-11 06:27:23+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 9.1.0-1.el9 started.
2024-11-11 06:27:23+00:00 [Note] [Entrypoint]: Initializing database files
2024-11-11T06:27:23.498279Z 0 [System] [MY-015017] [Server] MySQL Server Initialization - start.
2024-11-11T06:27:23.511819Z 0 [System] [MY-013169] [Server] /usr/sbin/mysqld (mysqld 9.1.0) initializing of server in progress as proce
ss 80
2024-11-11T06:27:23.613607Z 1 [System] [MY-013576] [InnoDB] InnoDB initialization has started.
2024-11-11T06:27:25.038464Z 1 [System] [MY-013577] [InnoDB] InnoDB initialization has ended.
2024-11-11T06:27:27.837812Z 6 [Warning] [MY-010453] [Server] root@localhost is created with an empty password ! Please consider switchi
ng off the --initialize-insecure option.
2024-11-11T06:27:31.563566Z 0 [System] [MY-015018] [Server] MySQL Server Initialization - end.
2024-11-11 06:27:31+00:00 [Note] [Entrypoint]: Database files initialized
2024-11-11 06:27:31+00:00 [Note] [Entrypoint]: Starting temporary server
2024-11-11T06:27:31.602966Z 0 [System] [MY-015015] [Server] MySQL Server - start.
2024-11-11T06:27:32.048835Z 0 [System] [MY-010116] [Server] /usr/sbin/mysqld (mysqld 9.1.0) starting as process 119
2024-11-11T06:27:32.146910Z 1 [System] [MY-013576] [InnoDB] InnoDB initialization has started.
2024-11-11T06:27:33.617836Z 1 [System] [MY-013577] [InnoDB] InnoDB initialization has ended.
2024-11-11T06:27:34.307234Z 0 [Warning] [MY-010068] [Server] CA certificate ca.pem is self signed.
2024-11-11T06:27:34.307261Z 0 [System] [MY-013602] [Server] Channel mysql_main configured to support TLS. Encrypted connections are now
```

```
Warning: Unable to load '/usr/share/zoneinfo/iso3166.tab' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/leap-seconds.list' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/leapseconds' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/tzdata.zi' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/zone.tab' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/zone1970.tab' as time zone. Skipping it.

2024-11-11 06:27:37+00:00 [Note] [Entrypoint]: Stopping temporary server
2024-11-11T06:27:38.035383Z 10 [System] [MY-013172] [Server] Received SHUTDOWN from user root. Shutting down mysqld (Version: 9.1.0).
2024-11-11T06:27:39.623433Z 0 [System] [MY-010910] [Server] /usr/sbin/mysqld: Shutdown complete (mysqld 9.1.0)  MySQL Community Server
- GPL.
2024-11-11T06:27:39.623744Z 0 [System] [MY-015016] [Server] MySQL Server - end.
2024-11-11 06:27:40+00:00 [Note] [Entrypoint]: Temporary server stopped

2024-11-11 06:27:40+00:00 [Note] [Entrypoint]: MySQL init process done. Ready for start up.

2024-11-11T06:27:40.068965Z 0 [System] [MY-015015] [Server] MySQL Server - start.
2024-11-11T06:27:40.276837Z 0 [System] [MY-010116] [Server] /usr/sbin/mysqld (mysqld 9.1.0) starting as process 1
2024-11-11T06:27:40.283246Z 1 [System] [MY-013576] [InnoDB] InnoDB initialization has started.
2024-11-11T06:27:42.553767Z 1 [System] [MY-013577] [InnoDB] InnoDB initialization has ended.
2024-11-11T06:27:43.133870Z 0 [Warning] [MY-010068] [Server] CA certificate ca.pem is self signed.
2024-11-11T06:27:43.133900Z 0 [System] [MY-013602] [Server] Channel mysql_main configured to support TLS. Encrypted connections are now
 supported for this channel.
2024-11-11T06:27:43.142378Z 0 [Warning] [MY-011810] [Server] Insecure configuration for --pid-file: Location '/var/run/mysqld' in the p
ath is accessible to all OS users. Consider choosing a different directory.
2024-11-11T06:27:43.347613Z 0 [System] [MY-010931] [Server] /usr/sbin/mysqld: ready for connections. Version: '9.1.0'  socket: '/var/ru
n/mysqld/mysqld.sock'  port: 3306  MySQL Community Server - GPL.
2024-11-11T06:27:43.347587Z 0 [System] [MY-011323] [Server] X Plugin ready for connections. Bind-address: '::' port: 33060, socket: /va
r/run/mysqld/mysqlx.sock
```

```
hduser@suraj:~$ cd assignment5/
hduser@suraj:~/assignment5$ ls
Dockerfile   test.py
hduser@suraj:~/assignment5$ docker build -t python-connector .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
            Install the buildx component to build images with BuildKit:
            https://docs.docker.com/go/buildx/

Sending build context to Docker daemon  4.608kB
Step 1/5 : FROM python:3.9-slim
3.9-slim: Pulling from library/python
a480a496ba95: Already exists
99b8d55c8acd: Pull complete
151089ffef3f: Pull complete
277f520eee4a: Pull complete
Digest: sha256:7a9cd42706c174cdcf578880ab9ae3b6551323a7ddbc2a89ad6e5b20a28fbfbe
Status: Downloaded newer image for python:3.9-slim
 ---> b9b3c02da6c3
Step 2/5 : WORKDIR /assignment5
 ---> Running in 1f34aba8291b
Removing intermediate container 1f34aba8291b
 ---> ff2b98a0e6fd
Step 3/5 : COPY . /assignment5
 ---> 445766f2d7f4
Step 4/5 : RUN pip install mysql-connector-python
 ---> Running in 70353fb2a408
Collecting mysql-connector-python
  Downloading mysql_connector_python-9.1.0-cp39-cp39-manylinux_2_28_x86_64.whl (34.4 MB)
     -------------------------------------- 34.4/34.4 MB 11.3 MB/s eta 0:00:00
Installing collected packages: mysql-connector-python
Successfully installed mysql-connector-python-9.1.0
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It
is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv

[notice] A new release of pip is available: 23.0.1 -> 24.3.1
[notice] To update, run: pip install --upgrade pip
Removing intermediate container 70353fb2a408
```

```
Step 3/5 : COPY . /assignment5
 ---> 445766f2d7f4
Step 4/5 : RUN pip install mysql-connector-python
 ---> Running in 70353fb2a408
Collecting mysql-connector-python
  Downloading mysql_connector_python-9.1.0-cp39-cp39-manylinux_2_28_x86_64.whl (34.4 MB)
     -------------------------------------- 34.4/34.4 MB 11.3 MB/s eta 0:00:00
Installing collected packages: mysql-connector-python
Successfully installed mysql-connector-python-9.1.0
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It
is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv

[notice] A new release of pip is available: 23.0.1 -> 24.3.1
[notice] To update, run: pip install --upgrade pip
Removing intermediate container 70353fb2a408
 ---> 7e063e0668f6
Step 5/5 : CMD ["python", "test.py"]
 ---> Running in 96e4ff8480d4
Removing intermediate container 96e4ff8480d4
 ---> 3a7123755ca7
Successfully built 3a7123755ca7
Successfully tagged python-connector:latest
hduser@suraj:~/assignment5$ docker run --name python-container --network hpcsa -ti python-connector
Successfully connected to MySQL
Database 'students' created successfully.
Table 'batch24' created successfully.
Sample data inserted into table 'batch24'.
MySQL connection is closed.
hduser@suraj:~/assignment5$ docker exec -ti dbserver mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 9.1.0 MySQL Community Server - GPL

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```

```
hduser@suraj: ~/assignment5                                                          —  □  ✕

mysql> use students
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+--------------------+
| Tables_in_students |
+--------------------+
| batch24            |
+--------------------+
1 row in set (0.00 sec)

mysql> select *from batch24
    -> ;
+----+-------+-----+
| id | name  | age |
+----+-------+-----+
|  1 | Alice |  22 |
|  2 | Bob   |  24 |
+----+-------+-----+
2 rows in set (0.00 sec)

mysql> insert into batch24(id, name, age) values(3, "Suraj", 21);
Query OK, 1 row affected (0.00 sec)

mysql> select *from batch24;
+----+-------+-----+
| id | name  | age |
+----+-------+-----+
|  1 | Alice |  22 |
|  2 | Bob   |  24 |
|  3 | Suraj |  21 |
+----+-------+-----+
3 rows in set (0.01 sec)

mysql>
```