Docker and Docker hub

Assignment 1:

Demonstrate minimum 15 basic docker command with explanation and screenshot.

1. Docker pull <image-name>
   Pulls the image from the docker hub

```
saurav@Saurav:~$ docker pull docker/getting-started
Using default tag: latest
latest: Pulling from docker/getting-started
df9b9388f04a: Pull complete
5867cba5fcbd: Pull complete
4b639e65cb3b: Pull complete
061ed9e2b976: Pull complete
bc19f3e8eeb1: Pull complete
4071be97c256: Pull complete
79b586f1a54b: Pull complete
0c9732f525d6: Pull complete
Digest: sha256:b558be874169471bd4e65bd6eac8c303b271a7ee8553ba47481b73b2bf597aae
Status: Downloaded newer image for docker/getting-started:latest
docker.io/docker/getting-started:latest
```

2. Docker build -t <image-name> .
   Builds the docker image.

```
E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker build -t welcome-app .
[+] Building 103.8s (9/9) FINISHED
 => [internal] load build definition from Dockerfile                                              0.1s
 => => transferring dockerfile: 31B                                                               0.1s
 => [internal] load .dockerignore                                                                 0.1s
 => => transferring context: 2B                                                                   0.1s
 => [internal] load metadata for docker.io/library/python:3.9                                     4.8s
 => CACHED [1/4] FROM docker.io/library/python:3.9@sha256:dd19baa7cbbf06a32808bb4d6dd63595010dc7da422ac332b789ee6ff08  0.0s
 => [internal] load build context                                                                 0.4s
 => => transferring context: 347B                                                                 0.4s
 => [2/4] COPY . /app                                                                             0.1s
 => [3/4] WORKDIR /app                                                                            0.1s
 => [4/4] RUN pip install -r requirements.txt                                                    88.5s
 => exporting to image                                                                            9.0s
 => => exporting layers                                                                           8.9s
 => => writing image sha256:c5efb0717e33c812cfdf5444e7ae202d8fd56d93193f6fbd34c704d98954a1be     0.0s
 => => naming to docker.io/library/welcome-app                                                    0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
```

3. Docker images
   Lists out all images

```
E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker images
REPOSITORY                TAG       IMAGE ID       CREATED          SIZE
welcome-app               latest    385e729c622c   14 minutes ago   1.08GB
docker/getting-started    latest    cb90f98fd791   6 months ago     28.8MB
```

4. docker rmi <image-name>

   Delete an Image

```
E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker rmi welcome-app
Error response from daemon: conflict: unable to remove repository reference "welcome-app" (must force) - container 518d1d737
525 is using its referenced image 385e729c622c

E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker rmi -f  welcome-app
Untagged: welcome-app:latest
Deleted: sha256:385e729c622c36c85bc3ff74d88175a9e1f29936663a852b0c041095a2f03ee3
```

5. docker image prune

```
saurav@Saurav:~$ docker image prune
WARNING! This will remove all dangling images.
Are you sure you want to continue? [y/N] n
Total reclaimed space: 0B
```

6. docker login -u <username>
   Login into Docker

```
saurav@Saurav:~$ docker login -u saurav1341
Password:
Login Succeeded
```

7. docker push <username>/<image-name>
   Publish an image to Docker Hub

```
saurav@Saurav:~$ docker push saurav1341/flask-welcome-app:latest
The push refers to repository [docker.io/saurav1341/flask-welcome-app]
cf3b30e56147: Pushed
5f70bf18a086: Mounted from krishnaik06/welcomeapp
8cc3c044abac: Pushed
a44f6dbb3aa3: Mounted from library/python
a3c041284573: Mounted from library/python
d7d83f440013: Mounted from library/python
0c7daf9a72c8: Mounted from library/python
75ba02937496: Mounted from library/python
288cf3a46e32: Mounted from library/python
186da837555d: Mounted from library/python
955c9335e041: Mounted from library/python
8e079fee2186: Mounted from library/python
latest: digest: sha256:a8be4e6aa9b2dd5e8b70ff916fea86d5d07d29522866a80043d0243b6e8e20dc size: 2843
```

8. docker search <image-name>
   Search Hub for an image

```
saurav@Saurav:~$ docker search jupyterlab
NAME                                         DESCRIPTION                                       STARS     OFFICIAL   AUTOMAT
ED
mikebirdgeneau/jupyterlab                    Jupyterlab based on python / alpine linux wi…     29                   [OK]
amalic/jupyterlab                            Hassle-free dark themed Jupyterlab v1.2.6 im…     9
dclong/jupyterlab                            JupyterLab (in Python 3).                         5                    [OK]
umids/jupyterlab                             Forked from amalic/jupyterlab                     5
gzupark/jupyterlab                           Docker images for the JupyterLab                  4
andreper/jupyterlab                          Build your own Apache Spark Standalone clust…     2
liuderchi/jupyterlab-ijavascript             Next Gen Jupyter Notebook --- JupyterLab wit…     2                    [OK]
caduedu14/jupyterlab-arm64                                                                     2
ndslabs/jupyterlab                           NDS Labs Workbench JupyterLab image               2                    [OK]
rucio/jupyterlab                                                                               1
lsstepo/jupyterlab                                                                             1
hassioaddons/jupyterlablite                                                                    1
chengyehwang/jupyterlab                      conda, python3, cython, pandas, plotly, sql,…     1
hassioaddons/jupyterlablite-amd64                                                              0
cyversevice/jupyterlab-scipy                 Jupyter Lab based on Jupyter SciPy notebook …     0
ffdlops/jupyterlab                                                                             0
truecharts/jupyterlab                                                                          0
elpra/jupyterlab                             This image can be used to run Jupyterlab loc…     0
navikt/jupyterlab                                                                              0
michaelbrucelin/jupyterlab                                                                     0
ewatercycle/jupyterlab-experiment-builder    Jupyter Lab Docker image with eWaterCycle de…     0                    [OK]
codeocean/jupyterlab                         JupyterLab base image                             0
nerc/jupyterlab                              Jupyterlab Notebook container for use in the…     0
eddiana/jupyterlab-elyra                                                                       0
marktmilligan/jupyterlab                                                                       0
```

9. docker run -p <host-port>:<container-port> <image-name>
    Run a container with and publish a container's port(s) to the host.

```
(venv) E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker run -d -p 5000:8000 saurav1341/flask-welcome-app
b00bb8c76f59a0960ad3d1d334744b0730c11de463f40bc1136729470f89310d
```

10. docker run -d <image-name>
    Run a container in the background

```
(venv) E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker run -d saurav1341/flask-welcome-app
0b876b5d890eb1f04ae6c14bf7c88f63e8efb13884c3129f43431ce38a6a1a69
```

11. docker stop <container-name>
    stop an existing container.

```
(venv) E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker stop charming_taussig
charming_taussig
```

12. docker rm <container-name>
    removes a container

13. docker ps
    To list currently running containers.

```
saurav@Saurav:~$ docker ps
CONTAINER ID   IMAGE                          COMMAND          CREATED         STATUS         PORTS      NAMES
0b876b5d890e   saurav1341/flask-welcome-app   "python app.py"  2 minutes ago   Up 2 minutes              gracious_shanno
n
```

14. docker ps –all

List all docker containers (running and stopped):

```
saurav@Saurav:~$ docker ps --all
CONTAINER ID   IMAGE                          COMMAND                  CREATED         STATUS                    PORT
S      NAMES
0b876b5d890e   saurav1341/flask-welcome-app   "python app.py"          3 minutes ago   Up 3 minutes
       gracious_shannon
b00bb8c76f59   saurav1341/flask-welcome-app   "python app.py"          5 minutes ago   Exited (137) 4 minutes ago
       charming_taussig
164c07fa0b73   docker/getting-started         "/docker-entrypoint.…"   5 hours ago     Exited (0) 3 hours ago
       elastic_diffie
```

15. docker container stats

View resource usage stats.

```
saurav@Saurav:~$ docker container stats
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.01%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.01%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.04%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.04%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.03%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.03%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.03%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.03%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
0b876b5d890e   gracious_shannon   0.01%     53.82MiB / 2.827GiB    1.86%     1.05kB / 0B     0B / 0B     8
CONTAINER ID   NAME               CPU %     MEM USAGE / LIMIT      MEM %     NET I/O         BLOCK I/O   PIDS
```

Assignment 2

Hello World Docker Image Run Hello World Docker Image Locally.

```
(venv) E:\Data Science Industry Ready Projects\Day 03\Docker\Flask App>docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```

Assignment 3

https://hub.docker.com/repository/docker/saurav1341/flask-welcome-app

```
saurav@Saurav:~$ docker push saurav1341/flask-welcome-app:latest
The push refers to repository [docker.io/saurav1341/flask-welcome-app]
cf3b30e56147: Pushed
5f70bf18a086: Mounted from krishnaik06/welcomeapp
8cc3c044abac: Pushed
a44f6dbb3aa3: Mounted from library/python
a3c041284573: Mounted from library/python
d7d83f440013: Mounted from library/python
0c7daf9a72c8: Mounted from library/python
75ba02937496: Mounted from library/python
288cf3a46e32: Mounted from library/python
186da837555d: Mounted from library/python
955c9335e041: Mounted from library/python
8e079fee2186: Mounted from library/python
latest: digest: sha256:a8be4e6aa9b2dd5e8b70ff916fea86d5d07d29522866a80043d0243b6e8e20dc size: 2843
```