# Assignment

<ol> <li>Install Docker, either on your native OS or on a VM. Make sure it runs. type "docker -v" to check if it's installed.</li> <li>try below commands for help dockerhelp&gt; This command shows all available options and commands to work</li> </ol>
with images and containers docker imageshelp> This command shows all the available options and commands
to work with docker images docker pshelp> This command shows all the available options and commands to work with docker containers Ans: Docker version 20.10.6, build 370c289
2. Find a image from dockerhub of your choice(recommended: nginx), don't use browser, pull the official image from dockerhub  Ans: docker pull nginx
3. List all the available images in your machine/vm, make sure you see recently pulled image in the list.  Ans: docker images
4. Find out the "Full" Imageld of the image that you pulled and write it below.  Ans: docker imagesno-trunc  >>> sha256:f0b8a9a541369db503ff3b9d4fa6de561b300f7363920c2bff4577c6c24c5cf6
5. Create a container of your image Ans: docker run nginx
6. List all the running containers Ans: docker ps
7. List all the running and stopped containers Ans docker ps -aq
8. Find out the "Full" containerId of the container and write it below.  Ans: docker psno-trunc  >>>8c1b9fc00c3555d13df7012dd31e7d4ac048f9ad46e03ea460659cf33a8c415d
9. Find out how many image layers are used to build this image. Ans: docker history nginx Or docker inspect <image-id></image-id>

10. Get the Apache Tomcat 7 server image from the docker hub. Ans: docker pull tomcat:7.0

11. Run the Apache Tomcat 7, I mean create a container of Apache Tomcat. Ans:docker run tomcat:7.0 12. Find out what is the IP Address of the Apache Tomcat Container that it is running on Ans: docker inspect --format '{{.NetworkSettings.IPAddress}}' ef945b18cf08 >>>'172.17.0.3' 13. Which Port it is using? Ans: docker inspect --format '{{.NetworkSettings.Ports}}' ef945b18cf08 >>> 'map[8080/tcp:[]]' 14. Try to access the Tomcat's home page from your machine/vm. 15. What is the disk size of Apache Tomcat image? Ans: docker system df -v or docker inspect --format '{{.Size}}' e614000ce544 (put image ID) 16. Find out list of all environment variables that is configured for tomcat image, can you see JAVA\_HOME and CATALINA\_HOME? What did you notice about it? Ans: docker run --env list tomcat:7.0 INFO: Java Home: /usr/local/openidk-8/jre

or

### docker exec ef945b18cf08 env

INFO: CATALINA\_HOME:

```
C:\Users\\podocker exec ef945bl8cf68 env

#ATH=/usr/local/toin:/usr/local/openjdk-8/bin:/usr/local/sbin:/usr/local/bin:/usr/local/bin:/usr/local/bin:/usr/local/bin:/usr/local/bin:/usr/local/bin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/sbin:/usr/local/s
```

17. Find out which port is exposed for tomcat?

Ans: docker port 7a16597526cd >>> 8080/tcp -> 0.0.0.0:8383

.....

18. Run multiple containers of tomcat on different port and access it's home page.

/usr/local/tomcat

Ans: docker run -d -p 8888:8080 tomcat:7.0 docker run -d -p 8383:8080 tomcat:7.0

19. Pull ubuntu os from dockerhub, try to pull 2 images of ubuntu, Except the latest one. Ans: docker pull ubuntu:xenial docker pull ubuntu:rolling 20. Run the container of ubuntu in attached mode. Ans: docker run -it ubuntu:xenial 21. Run the container of another ubuntu in detached mode. Ans: docker run -d ubuntu:rolling 22. Check how many ubuntu containers are running and stopped Ans: docker ps 23. Is the tomcat container running? If no, start one. Ans: yes 24. Check the logs, generated by tomcat container(don't forget to make request to tomcat's home page to see the log). Ans: docker logs 7a16597526cd 25. Check if the Ubuntu container is running? If no, start one in attached mode to the terminal. Ans: docker ps docker attach 9ff95a467e45 26. Login as root user in ubuntu container Ans: C:\Users\hp>docker run -it 9ff95a467e45 root@0c0ac3986a8e:/# whoami root root@0c0ac3986a8e:/# 27. Create a file with any name in root directory Ans: :\Users\hp>docker run -it 9ff95a467e45 oot@0c0ac3986a8e:/# whoami coot@0c0ac3986a8e:/# touch myfile oot@0c0ac3986a8e:/# ls in boot dev etc home lib lib64 media mnt <mark>myfile</mark> opt proc root run sbin srv sys <mark>tmp</mark> usr var oot@0c0ac3986a8e:/#

28. Install software of your choice in ubuntu container using "apt-get install"

### Ans:

```
proctp80-08-2986a8-278 as bin boot dev et home 11b 11b64 media mnt myfile opt proc root run sbin srv sys to usr var roots80-08-298a8-278 apt-get update  
Get:1 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 k8]  
Get:2 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 k8]  
Get:3 http://security.ubuntu.com/ubuntu xenial-security InRelease [107 k8]  
Get:3 http://security.ubuntu.com/ubuntu xenial-backpoorts InRelease [107 k8]  
Get:5 http://security.ubuntu.com/ubuntu xenial-security/main amd6d Packages [155 k8]  
Get:6 http://security.ubuntu.com/ubuntu xenial-security/main amd6d Packages [155 k8]  
Get:6 http://security.ubuntu.com/ubuntu xenial-security/main amd6d Packages [15. k8]  
Get:10 http://security.ubuntu.com/ubuntu xenial-security/main amd6d Packages [15. k8]  
Get:10 http://security.ubuntu.com/ubuntu xenial-security/mainty-security.ubuntu.com/ubuntu xenial-updates/main-maid6d Packages [16. 48]  
Get:11 http://archive.ubuntu.com/ubuntu xenial-updates/main-verse amd6d Packages [16. 48]  
Get:13 http://archive.ubuntu.com/ubuntu xenial-updates/main-verse amd6d Packages [16. 48]  
Get:14 http://archive.ubuntu.com/ubuntu xenial-updates/main-verse amd6d Packages [16. 48]  
Get:14 http://archive.ubuntu.com/ubuntu xenial-backports/main amd6d Packages [16. 48]  
Bupgradde,1 newly installed,0 t
```

29. Now exit the ubuntu shell, are you back to your host machine, if not, come back to the host machine.

```
root@0c0ac3986a8e:/# apt-get install tree
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
O upgraded, 1 newly installed, O to remove and 5 not upgraded.
Need to get 40.6 kB of archives.
After this operation, 138 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu xenial/universe amd64 tree amd64 1.7.0-3 [40.6
Fetched 40.6 kB in 1s (33.4 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package tree.
(Reading database ... 4785 files and directories currently installed.)
Preparing to unpack .../tree_1.7.0-3_amd64.deb ...
Unpacking tree (1.7.0-3) ...
Setting up tree (1.7.0-3) ...
root@0c0ac3986a8e:/# exit
exit
C:\Users\hp>
```

Yes, back to host machine

.....

. . . . . .

30. Check if the ubuntu container is running.

Ans. Yes container is running

31. Create a new ubuntu container out of the same image as that previous container in attached mode.

Ans. docker run -it ubuntu:xenial

32. Login as a root user

```
C:\Users\hp>docker run -it ubuntu:xenial
root@4ef2604d066b:/# whoami
root
root@4ef2604d066b:/#
Ans:
```

33. Check if you can see the file created in previous container, you will not see the file as well as software that you installed in the previous container. Now kill this Container. Ans:

```
C:\Users\hp>docker run -it ubuntu:xenial
root@4ef2604d066b:/# whoami
root
root@4ef2604d066b:/# ls
bin dev home lib64 mnt proc run srv tmp var
boot etc lib media opt root sbin sys usr
root@4ef2604d066b:/# exit
exit
```

docker kill 4ef2604d066b (container ID)

.....

34. Do you have the previous ubuntu container where you created the file and installed the software? If no repeat step 25 to 29.

Ans: I have previous ubuntu container

```
C:\Users\hp>docker attach 0c0ac3986a8e
root@0c0ac3986a8e:/#
root@0c0ac3986a8e:/# ls
bin dev home lib64 mnt opt root sbin sys usr
boot etc lib media myfile proc run srv tmp var
root@0c0ac3986a8e:/# which tree
/usr/bin/tree
root@0c0ac3986a8e:/#
```

35. Create an Image out of the existing container.

```
C:\Users\hp>docker commit 0c0ac3986a8e prachi
sha256:3bf8424dbcdfd8cfef64c8fe9a8eeff6221a43f5b855e2fe9789597e40dd23af
```

36. Now Create a Container out of this image and login into it to see if you can see the file and software installed by you in the previous container.

Ans: yes, have software installed in the previous container

```
::\Users\hp>docker commit 0c0ac3986a8e prachi
sha256:3bf8424dbcdfd8cfef64c8fe9a8eeff6221a43f5b855e2fe9789597e40dd23af
::\Users\hp>docker run -it prachi
oot@53f79d349a26:/# ls
in boot dev etc home lib lib64 media mnt myfile opt proc root run sbin srv sys <mark>tmp</mark> usr var
root@53f79d349a26:/# which tree
/usr/bin/tree
root@53f79d349a26:/#
```

37. Do you have running tomcat container? If yes, Stop it and kill all tomcat container. Ans: docker stop 39b0038b31be 7a16597526cd

```
C:\Users\hp>docker ps
CONTAINER ID IMAGE
                                       COMMAND
                                                                CREATED
                                                                                 STATUS
                                                                                                PORTS
                      NAMES
4ef2604d066b ubuntu:xenial
                                       "/bin/bash"
                                                                48 minutes ago
                                                                                Up 36 minutes
                      quizzical_hofstadter
6c2728dae982 docker/getting-started
                                       "/docker-entrypoint..."
                                                               16 hours ago
                                                                                Up 6 seconds
                                                                                                0.0.0.0:80->8
0/tcp, :::80->80/tcp elated_mclaren
```

38. Create an index.html file with following code in it:-

<h1>This is Tomcat Container</h1>

Now, Start a tomcat container in such a way that on hitting its URL for home page it should show the above html page.

```
:\Users\hp>docker exec -it 27295c167583 bash
root@27295c167583:/usr/local/tomcat# ls
LICENSE NOTICE RELEASE-NOTES RUNNING.txt bin conf include lib logs native-jni-lib temp webapps work
root@27295c167583:/usr/local/tomcat# cd webapps
root@27295c167583:/usr/local/tomcat/webapps# cd ROOT
oot@27295c167583:/usr/local/tomcat/webapps/ROOT# echo "<h1>this is tomcat Container</h1>" > index.html
root@27295c167583:/usr/local/tomcat/webapps/ROOT# cat index.html
<h1>this is tomcat Container</h1>
root@27295c167583:/usr/local/tomcat/webapps/ROOT#
```

At port localhost:9787 this will appear



this is tomcat Container



39. type below command:-

docker images --help

Now, try to run command that proves the concept of following three options:-

- 1. -a
- 2. -f
- 3. -q

```
Command Prompt
C:\Users\hp>docker images -a
REPOSITORY
                        TAG
                                  IMAGE ID
                                                CREATED
                                                                 SIZE
prachi
                        latest
                                  3bf8424dbcdf
                                                34 minutes ago
                                                                 167MB
                                  71941adaa9d3 42 minutes ago
<none>
                        <none>
                                                                 135MB
ubuntu
                                 9ff95a467e45
                        xenial
                                                                 135MB
                                                3 days ago
docker/getting-started
                                  3ba8f2ff0727
                                                                 27.9MB
                        latest
                                                2 months ago
tomcat
                        8.0
                                  ef6a7c98d192
                                                                 356MB
                                                2 years ago
C:\Users\hp>docker images -q
3bf8424dbcdf
71941adaa9d3
9ff95a467e45
3ba8f2ff0727
ef6a7c98d192
C:\Users\hp>docker images list --quiet --filter dangling=true
```

40. type below command:docker ps --help Now, try to run command that proves the concept of following six options:-

- 1. -a
- 2. -f
- 3. -q
- 4. -n
- 5. -l
- 6. -s

```
CONTAINER 1D 1896E COMMAND CREATED STATUS PORTS NAMES

CONTAINER 1D 1896E COMMAND CREATED STATUS PORTS

CONTAINER 1D 1896E COMMAND CREA
```

......

# 41. Type below command:-

docker --help

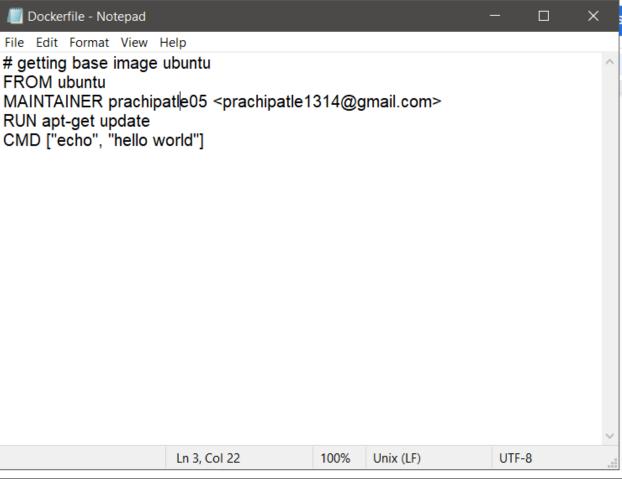
you will various sections of commands apart from options like "Managemnet Commands" and "Commands".

Write some texts below describing the use of "Management Commands".

Use each command mentioned below and prove its concepts as described in the --help desription. write what you have understood from the output of the command after its successful execution.

- **1. cp –** It Copy files/folders between a container and the local filesystem
- **2. create –** It Creates a new container but does not run it, we need to start it separately.
- **3. export -** Export a container's filesystem as a tar archive, docker export <container-name> > example.tar

5. info – It displays system-wide information
6. login – It is used to log in to a Docker registry
7. logout - It is used to log out from a Docker registry
8. rename - Renames a container
9. save - save one or more images to a tar archive,
docker save <container-name> &gt; example.tar</container-name>
<b>10. stats –</b> It displays a live stream of container(s) resource usage statistics
11. top - Display the running processes of a container
42. Kill all running container in one liner command.
Ans: docker container kill \$(docker ps -q) or docker rm -f \$(docker ps -qa)
Ans: docker container kill \$(docker ps -q) or



C:\Users\hp\Desktop\Dockerfiles>docker run d953de184e4b
hello world

.....

45. Create one or more Dockerfile that demostrate the following commands in Dockerfile (Write a PoC for each in one or more Dockerfile)

- 1. USER
- 2. RUN
- 3. ENV
- 4. CMD
- 5. RUN
- 6. ENTRYPOINT
- 7. EXPOSE
- 8. VOLUME

```
nginx_rc.yml 🗵 📙 nginx_service.yml 🗵 📙 nginx_deployment.yml 🗵 📙 Dockerfile 🗵
    FROM centos: latest
    MAINTAINER prachipatle05
    EN. ; rkdir /var/www/html
 3
    RUN yum -y install httpd
 4
 5
    VOLUME C:\Users\hp\Desktop\ppp
 6
    USER root
 7
    WORKDIR $workdir
    CMD ["/usr/sbin/httpd", "-D", "FOREGROUND"]
 8
 9
    EXPOSE 8383
    ENTRYPOINT ["centos"]
10
```

.....

## 46. Dockerhub:-

Find a application you care about on docker hub.

Launch the container.

Install another application in it.

Save (commit) the image.

Upload that to docker hub in your account and share it with a colleague, ask them to use your image and run the container out of it in their machine/vm.

## Ans:

Converted the container with ubuntu+nginx installed to docker image and pushed it docker hub

```
C:\Users\hp>docker push prachipatle05/ubuntu-nginx45
Using default tag: latest
The push refers to repository [docker.io/prachipatle05/ubuntu-nginx45]
1fe7f2dbb80e: Pushed
cdc4d0cd3d15: Mounted from library/ubuntu
43d05a2c9517: Mounted from library/ubuntu
1902cf049561: Pushed
9fe04650404a: Mounted from library/ubuntu
latest: digest: sha256:02afafd4064cb627074be54305cbeac7bac87cfc27bb57f6fd075b5aefef44ad size: 1362
```

Others can use my image from--

https://hub.docker.com/repository/docker/prachipatle05/ubuntu-nginx45