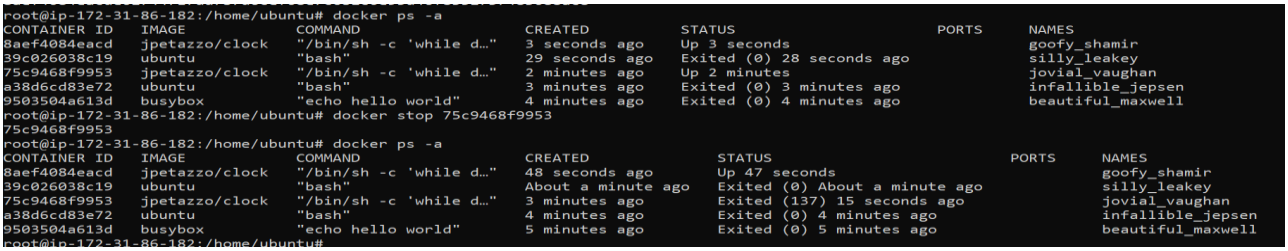
Docker:

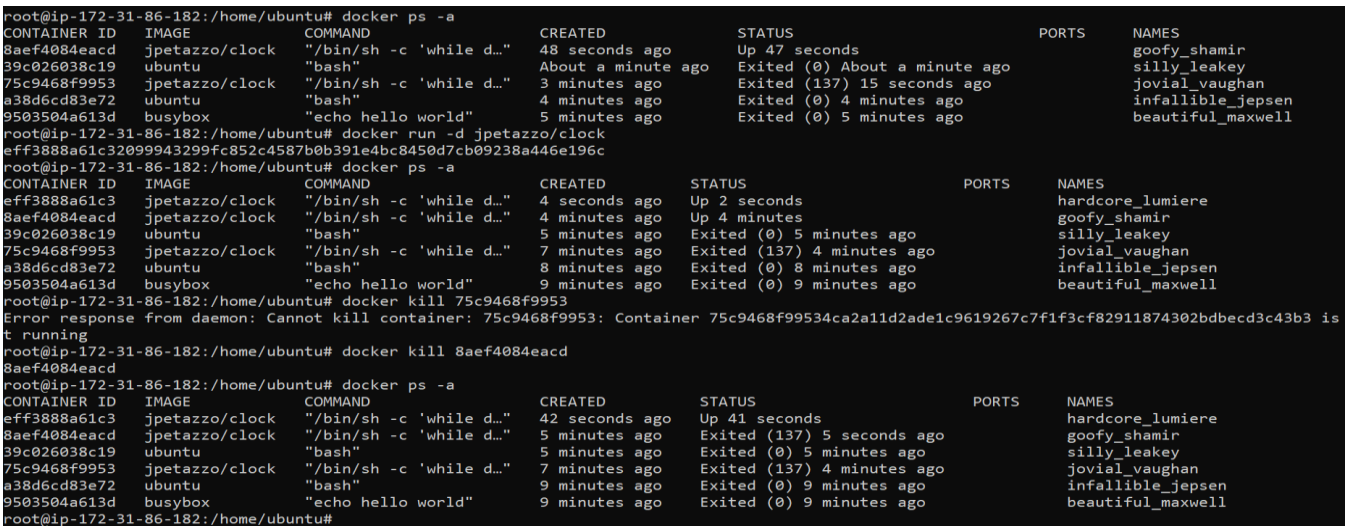
Note: Question 1 to 9 each question is 1 marks, Question no. 10, 11 is 5 Marks while Question 12 is for 6 marks.

1) Write a command to stopping and restarting a Docker container?

docker stop running_container_id(it will stop the running container after 10 seconds)



docker kill running_container_id(it will stop the running container immediately)



docker restart exited_container_id(it will restart the container again)

```
root@ip-172-31-86-182:/home/ubuntu# docker ps -a
CONTAINER ID   IMAGE            COMMAND                  CREATED          STATUS                      PORTS     NAMES
eff3888a61c3   jpetazzo/clock   "/bin/sh -c 'while d…"   42 seconds ago   Up 41 seconds                         hardcore_lumiere
8aef4084eacd   jpetazzo/clock   "/bin/sh -c 'while d…"   5 minutes ago    Exited (137) 5 seconds ago            goofy_shamir
39c026038c19   ubuntu           "bash"                   5 minutes ago    Exited (0) 5 minutes ago              silly_leakey
75c9468f9953   jpetazzo/clock   "/bin/sh -c 'while d…"   7 minutes ago    Exited (137) 4 minutes ago            jovial_vaughan
a38d6cd83e72   ubuntu           "bash"                   9 minutes ago    Exited (0) 9 minutes ago              infallible_jepsen
9503504a613d   busybox          "echo hello world"       9 minutes ago    Exited (0) 9 minutes ago              beautiful_maxwell
root@ip-172-31-86-182:/home/ubuntu# docker restart 8aef4084eacd
8aef4084eacd
root@ip-172-31-86-182:/home/ubuntu# ps -a
    PID TTY          TIME CMD
   3522 pts/0    00:00:00 sudo
   3523 pts/0    00:00:00 su
   3524 pts/0    00:00:00 bash
   6209 pts/0    00:00:00 ps
root@ip-172-31-86-182:/home/ubuntu# docker ps -a
CONTAINER ID   IMAGE            COMMAND                  CREATED          STATUS                      PORTS     NAMES
eff3888a61c3   jpetazzo/clock   "/bin/sh -c 'while d…"   2 minutes ago    Up 2 minutes                          hardcore_lumiere
8aef4084eacd   jpetazzo/clock   "/bin/sh -c 'while d…"   6 minutes ago    Up 12 seconds                         goofy_shamir
39c026038c19   ubuntu           "bash"                   7 minutes ago    Exited (0) 7 minutes ago              silly_leakey
75c9468f9953   jpetazzo/clock   "/bin/sh -c 'while d…"   9 minutes ago    Exited (137) 6 minutes ago            jovial_vaughan
a38d6cd83e72   ubuntu           "bash"                   10 minutes ago   Exited (0) 10 minutes ago             infallible_jepsen
9503504a613d   busybox          "echo hello world"       11 minutes ago   Exited (0) 11 minutes ago             beautiful_maxwell
root@ip-172-31-86-182:/home/ubuntu#
```

2) Write a command to create a Docker image?

nano Dockerfile

FROM ubuntu

RUN apt-get update

RUN apt-get install figlet

cat Dockerfile

docker build -t figlet1 .

docker image ls

docker run -it figlet1

figlet aish

exit

```
root@ip-172-31-86-182:/home/ubuntu# cat Dockerfile
 FROM ubuntu

 RUN apt-get update
 RUN apt-get install figlet
root@ip-172-31-86-182:/home/ubuntu# docker build -t figlet1 .
Sending build context to Docker daemon  13.31kB
Step 1/3 : FROM ubuntu
 ---> ba6acccedd29
Step 2/3 : RUN apt-get update
 ---> Using cache
 ---> e710d3ee6f88
Step 3/3 : RUN apt-get install figlet
 ---> Using cache
 ---> d07880c69cc7
Successfully built d07880c69cc7
Successfully tagged figlet1:latest
root@ip-172-31-86-182:/home/ubuntu# docker run -it figlet1
root@58f7419e8e4a:/# figlet aish
      _           _
  __ _(_)___| |__
 / _` | / __| '_ \
| (_| | \__ \ | | |
 \__,_|_|___/_| |_|

root@58f7419e8e4a:/#
```

3) Write a command to view all the running Docker containers?

docker ps (gives list of all running containers)

```
root@ip-172-31-86-182:/home/ubuntu# docker ps
CONTAINER ID   IMAGE           COMMAND                  CREATED         STATUS         PORTS     NAMES
eff3888a61c3   jpetazzo/clock  "/bin/sh -c 'while d…"   18 minutes ago  Up 18 minutes            hardcore_lumiere
8aef4084eacd   jpetazzo/clock  "/bin/sh -c 'while d…"   23 minutes ago  Up 17 minutes            goofy_shamir
```

docker ps –a(gives list of all running and exited containers)

```
root@ip-172-31-86-182:/home/ubuntu# docker ps -a
CONTAINER ID   IMAGE           COMMAND                  CREATED          STATUS                          PORTS     NAMES
58f7419e8e4a   figlet1         "bash"                   6 minutes ago    Exited (0) About a minute ago             lucid_aryabhata
f81a027208fc   figlet          "bash"                   8 minutes ago    Exited (0) 7 minutes ago                  modest_mestorf
3a5cf9e39d13   figlet          "bash"                   11 minutes ago   Exited (129) 9 minutes ago                mistic_joliot
eff3888a61c3   jpetazzo/clock  "/bin/sh -c 'while d…"   20 minutes ago   Up 20 minutes                             hardcore_lumiere
8aef4084eacd   jpetazzo/clock  "/bin/sh -c 'while d…"   24 minutes ago   Up 18 minutes                             goofy_shamir
39c026038c19   ubuntu          "bash"                   25 minutes ago   Exited (0) 25 minutes ago                 silly_leakey
75c9468f9953   jpetazzo/clock  "/bin/sh -c 'while d…"   27 minutes ago   Exited (137) 24 minutes ago               jovial_vaughan
a38d6cd83e72   ubuntu          "bash"                   28 minutes ago   Exited (0) 28 minutes ago                 infallible_jepsen
9503504a613d   busybox         "echo hello world"       29 minutes ago   Exited (0) 29 minutes ago                 beautiful_maxwell
root@ip-172-31-86-182:/home/ubuntu#
```

4) What command is used for running images as a container?

docker run –it file_name

```
root@ip-172-31-86-182:/home/ubuntu# cat Dockerfile
 FROM ubuntu

 RUN apt-get update
 RUN apt-get install figlet
root@ip-172-31-86-182:/home/ubuntu# docker build -t figlet1 .
Sending build context to Docker daemon  13.31kB
Step 1/3 : FROM ubuntu
 ---> ba6acccedd29
Step 2/3 : RUN apt-get update
 ---> Using cache
 ---> e710d3ee6f88
Step 3/3 : RUN apt-get install figlet
 ---> Using cache
 ---> d07880c69cc7
Successfully built d07880c69cc7
Successfully tagged figlet1:latest
root@ip-172-31-86-182:/home/ubuntu# docker run -it figlet1
root@58f7419e8e4a:/# figlet aish
      _     _
  __ _(_)___| |__
 / _` | / __| '_ \
| (_| | \__ \ | | |
 \__,_|_|___/_| |_|

root@58f7419e8e4a:/# exit
exit
```

5) What is a cloud-hosted service of Docker providing registry capabilities for public and private content?

Docker Hub is a cloud-based repository in which Docker users can create ,test, store and distribute container images. Through, Docker Hub, a user can access public, open-source image repositories, as well can create their own private repositories. It is similar to Git Hub.

6) What is a template used for describing a build of an image?

A template used for describing a image is Dockerfile.

Example:

nano Dockerfile

FROM ubuntu

RUN apt-get update

RUN apt-get install figlet

cat Dockerfile

docker build –t fig .

docker run –it fig

7) Multiple containers running on a single machine all share the same resources such as the operating system kernel for instant boot and efficient utilization of RAM. True or False?

True

8) What command is used for remove all stopped containers, unused networks, build caches, and dangling images?

docker system prune

```
root@ip-172-31-86-182:/home/ubuntu# docker system prune
WARNING! This will remove:
  - all stopped containers
  - all networks not used by at least one container
  - all dangling images
  - all dangling build cache

Are you sure you want to continue? [y/N] y
Deleted Containers:
58f7419e8e4a5582916907fc8eb1492ba2c472638b539d8d7d7ceeed4da196ee
f81a027208fc53c343c05e7e6010a76f6e286befcf5670eba678cb6a7aee6b4f
3a5cf9e39d13f7abf74903aeb9202649885bb58dbff022c7e3a263f7b027e816
39c026038c19f5529c522563dc7a46ffc425f7c7bdd88f250e6dff570dfad3b3
75c9468f99534ca2a11d2ade1c9619267c7f1f3cf82911874302bdbecd3c43b3
a38d6cd83e723084350ce3b9ae7fdd6d26286f83970277e9add77ad9cb8ec819
9503504a613d94e3c78ac2333de74f834c07fc5409cd4a4b2cead81e2fee35fe

Total reclaimed space: 39B
```

9) What command is used for running images as a container?

docker run –it file_name

```
root@ip-172-31-86-182:/home/ubuntu# cat Dockerfile
 FROM ubuntu

 RUN apt-get update
 RUN apt-get install figlet
root@ip-172-31-86-182:/home/ubuntu# docker build -t figlet1 .
Sending build context to Docker daemon  13.31kB
Step 1/3 : FROM ubuntu
 ---> ba6acccedd29
Step 2/3 : RUN apt-get update
 ---> Using cache
 ---> e710d3ee6f88
Step 3/3 : RUN apt-get install figlet
 ---> Using cache
 ---> d07880c69cc7
Successfully built d07880c69cc7
Successfully tagged figlet1:latest
root@ip-172-31-86-182:/home/ubuntu# docker run -it figlet1
root@58f7419e8e4a:/# figlet aish
        _     _
  __ _(_)___| |__
 / _` | / __| '_ \
| (_| | \__ \ | | |
 \__,_|_|___/_| |_|

root@58f7419e8e4a:/# exit
exit
```

10) Explain what are Dockerfiles?

A Dockerfile is a text document that contains all the commands a user could call on the command line to assemble an image.

nano Dockerfile

FROM ubuntu

RUN apt-get update

RUN apt-get install figlet

cat Dockerfile

docker build –t fig1 .

docker run –it fig1

```
root@ip-172-31-86-182:/home/ubuntu# cat Dockerfile
 FROM ubuntu

 RUN apt-get update
 RUN apt-get install figlet
root@ip-172-31-86-182:/home/ubuntu# docker build -t figlet1 .
Sending build context to Docker daemon  13.31kB
Step 1/3 : FROM ubuntu
 ---> ba6acccedd29
Step 2/3 : RUN apt-get update
 ---> Using cache
 ---> e710d3ee6f88
Step 3/3 : RUN apt-get install figlet
 ---> Using cache
 ---> d07880c69cc7
Successfully built d07880c69cc7
Successfully tagged figlet1:latest
root@ip-172-31-86-182:/home/ubuntu# docker run -it figlet1
root@58f7419e8e4a:/# figlet aish
        _     _
  __ _ (_)___| |__
 / _` | / __| '_ \
| (_| | \__ \ | | |
 \__,_|_|___/_| |_|

root@58f7419e8e4a:/# exit
exit
```

11) List the most commonly used instructions in Dockerfile?

FROM-

```
FROM <image name>:<tag name>
```

Eg: `FROM ubuntu`

`FROM centos`

RUN-

Eg: `RUN apt-get -y install httpd`

`RUN apt-get -y update`

For multiple RUN instructions:

Eg: `RUN apt-get -y update \`

```
    && apt-get -y install firefox
```

CMD-

```
CMD echo "Hello world"
```

ENTRYPOINT- The difference between ENTRYPOINT and CMD is that, if you try to specify default arguments in the docker run command, it will not ignore the ENTRYPOINT arguments.

```
ENTRYPOINT ["/bin/echo", "Welcome to docker]CMD ["Hello World!"]
```

This instruction allows you to copy a directory from your local machine to the docker container.

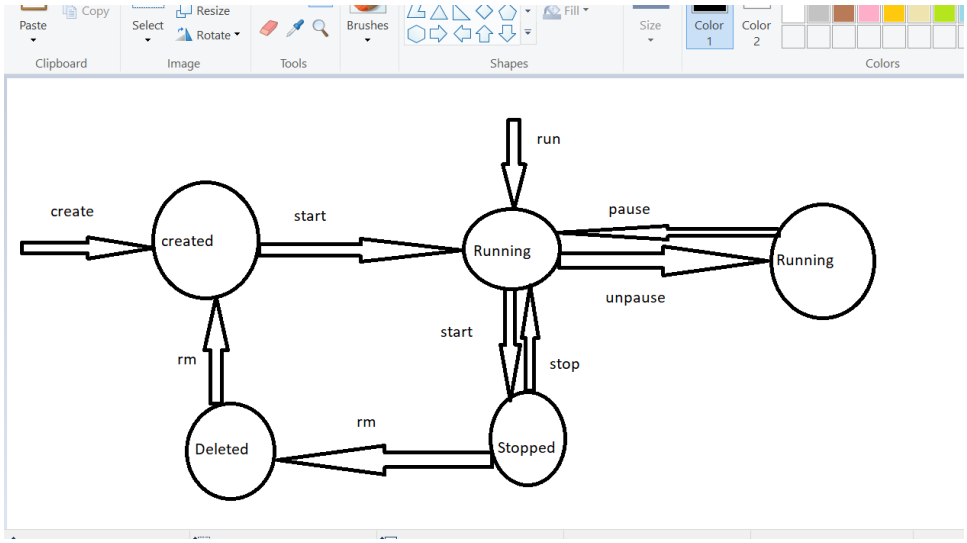
```
FROM ubuntu

WORKDIR /usr/src/app

COPY ~/Desktop/myapp .
```

12) Explain Docker lifecycle of Docker Container?

- **Created**: A container that has been created but not started
- **Running**: A container running with all its processes
- **Paused**: A container whose processes have been paused
- **Stopped**: A container whose processes have been stopped
- **Deleted**: A container in a dead state



Kubenetes:

Each Question is 1 marks.

1) **At its core, Kubernetes is a platform for:**

A. Provisioning machines (similar to Puppet, Ansiblee
B. Running and scheduling container applications on a cluster.
C. Packaging software in containers

2) Which of the following are core Kubernetes objects ?

A. Pods

B.Volumes

C.Services

D. All of them

3)Kubernetes Network proxy runs on which node ?

A. Master Node

B.Worker Node

C.CIDR Node

D.Both A & B

4) runs on each node and ensures containers are running in a pod.

A. Etcd

B.Pod

C.Kubelet

D.Scheduler

5) Which of them is a Kubernetes Controller ?

A. ReplicaSet

B.Deployment

C.Rolling Updates

D.Both A & B

6)..... are the Kubernetes controllers.

A. Replicaset

B.Deployment

C.Namespace

D.Both Replicaset & Deployment

7) Kubernetes is the type of cluster management software.

A. True

B.False

8) Which of the following are the components of Kubernetes Master Machine?

A. Scheduler

B.Controller Manager

C.API Server & etcd

D.All of the above

9) Kubernetes API currently supports ..... type of selectors.

A. Set-based selectors

B.Equality-based selectors

C.both Set-based & Equality-based selectors

D.None of the above

10) What are the some important functionalities of a Namespace in Kubernetes?

A. Namespaces help pod-to-pod communication using the same namespace.

B.Namespaces provide logical separation between the teams and their environments.

C.Namespaces are virtual clusters that can sit on top of the same physical cluster.

D.All of the above

11) There are ..... types of Pods in kubernets?

A. 2

B.3

C.4

D.6

12) GKE stands for ____.

A. Google Cluster Engine

B. Google Kubernetes Engine

C. Google Container Engine

D. None of the above

13) Which of the following commands allow you to validate a cluster created with Kubernetes operations?

A. kubectl validate cluster

B. kubeadm validate cluster

C. kops validate cluster

D. None of the above

14) What is the default range of ports used to expose a NodePort service?

A. 30000-32767

B. 500-1000

C. 60000-65536

D. 1024-32767

15) Which of the following commands gives you detailed info on a Pod?

A. kubectl describe pods

B. kubectl get pods -vvv

C. kubectl get pods –detail

D. kubectl pods inspect

16) What is the default protocol for a Service?

A. TCP

B. UDP

C. HTTP

D. SSH

17) Which of the following is true about Pods and IP addressing?

A. Pods only work with IPv6 addresses

B. All containers in a Pod get unique IP addresses

C. An external DHCP server is required for Pod IP addressing

D. All containers in a Pod share a single IP address

18) In Kubernetes, a node is:

A. A tool for starting a kubernetes cluster on a local machine
B. A worker machine
C. A machine that coordinates the scheduling and management of application containers on the cluster

19) What can you deploy on Kubernetes?

A. Containers
B. Virtual Machines
C. System Processes (like sshd, httpd)

20) **We have a node named nodeA, and we want to add a tainting effect to it, which command we will use**

a. kubectl taint nodes nodeA key:=NoSchedule

b. kubectl taint node key:=NoSchedule

c. kubectl taint nodes nodeA

d. All of the Above