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Branch - CBA Batch - 51
Microservices Practical 11

Aim : To understand Basic Commands and concept of Containers and Images in Docker.

Scenario : Your company has created set of codes for their applications on Android, and wants to run commands from a predefined Busybox container on the system, but your team does not know much about Docker. Show them how to do the following with the help of the BusyBox container itself.

1. Fetch the Busybox image from the Docker registry and save it to your system.

The screenshot shows a Docker Desktop terminal window on Garuda Linux. The user has successfully pulled the busybox image from the Docker registry. The terminal output shows the following commands and results:

```
yash@haribol64 in ~  
A docker pull busybox  
Using default tag: latest  
latest: Pulling from library/busybox  
3f4d90098f5b: Pull complete  
Digest: sha256:3fbc632167424a6d997e74f52b878d7cc478225c977eedfe51c7f4e79  
Status: Downloaded newer image for busybox:latest  
docker.io/library/busybox:latest
```

Next, the user runs `docker ps -a`, which shows a list of containers. The output is as follows:

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4cd7ddfd199f	gcr.io/k8s-minikube/kicbase:v0.0.40	"/usr/local/bin/entr..."	4 days ago	Exited (130) 4 hours ago		minikube

Finally, the user runs `docker image ls`, which shows a list of Docker images. The output is as follows:

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
docketeerxlv/docketeer-extension	14.0.1	22d9f48f97fa	5 weeks ago	251MB
docketeerxlv/prometheus-extension	latest	162bc37e7bac	5 weeks ago	245MB
docketeerxlv/grafana-extension	latest	44f287518aa0	5 weeks ago	336MB
coderecom/code-server	4.16.1	1a335bfd9f62	2 months ago	720MB
busybox	latest	a416a98b71e2	2 months ago	4.26MB
docketeerxlv/node-exporter-extension	latest	5403b019f9f7	2 months ago	22.8MB
gcr.io/k8s-minikube/kicbase	v0.0.40	c6cc01e60919	2 months ago	1.19GB
hubproxy.docker.internal:5555/docker/desktop-kubernetes	kubernetes-v1.27.2-cni-v1.2.0-critools-v1.27.0-cri-dockerd-v0.3.2-1-debian	c763812a4530	3 months ago	418MB

The terminal window also shows a "Walkthroughs" section with two items:

- What is a container? 5 mins
- How do I run a container? 6 mins

The bottom of the terminal window shows system status: RAM 3.65 GB, CPU 1.52%, Disk 56.02 GB avail. of 67.32 GB, and a notification for "Not signed in".

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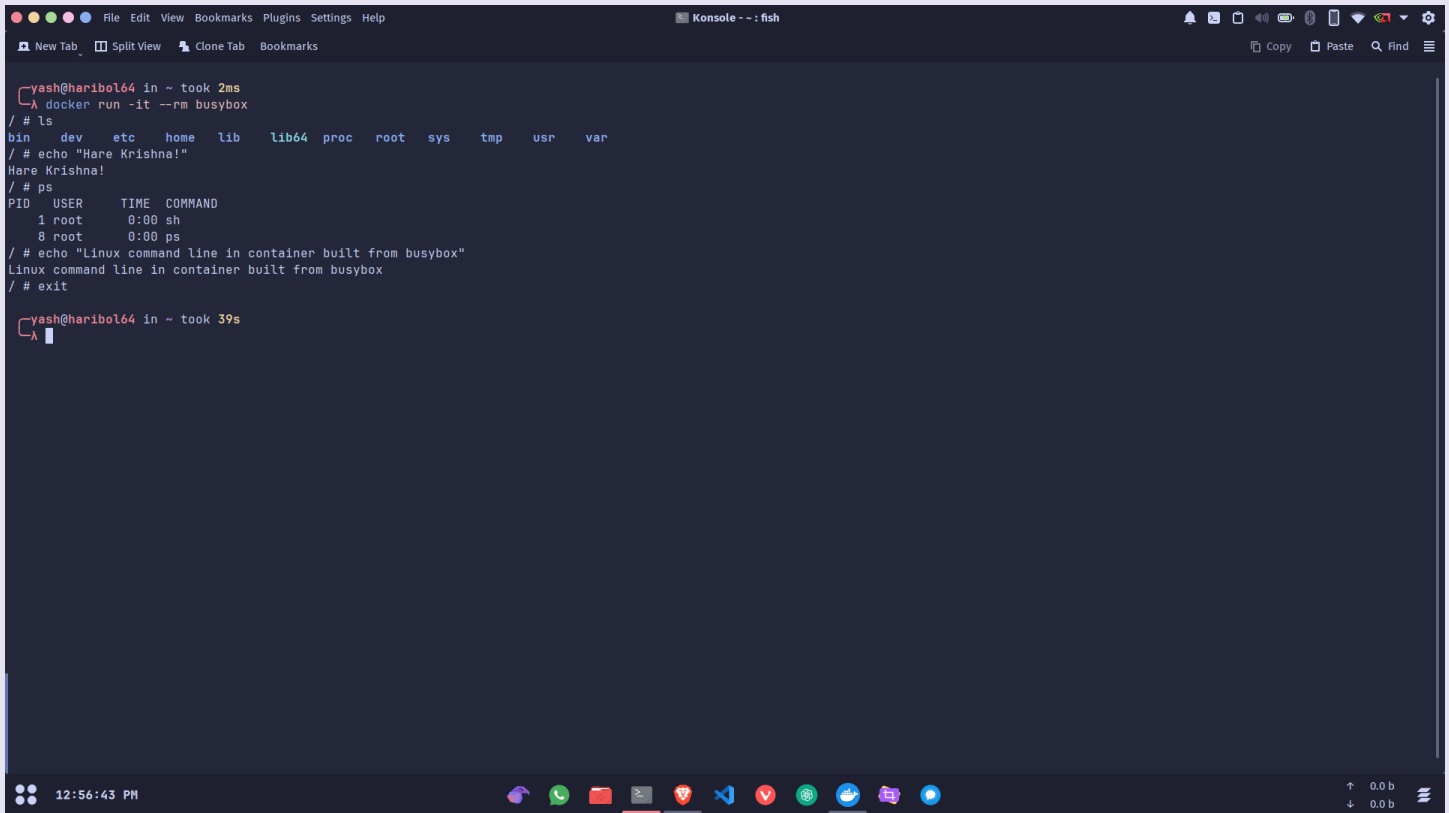
2. Run a Docker container based on this image.

```
yash@haribol64 in ~  
└─ docker image ls  
REPOSITORY                                TAG                                IMAGE ID                            CREATED                            SIZE  
docketeerxiv/docketeer-extension          14.0.1                            22d9f48f97fa                       5 weeks ago                       251MB  
docketeerxiv/prometheus-extension         latest                             162bc37e7bac                       5 weeks ago                       245MB  
docketeerxiv/grafana-extension            latest                             44f287518aa0                       5 weeks ago                       336MB  
codercom/code-server                     4.16.1                             1a335bfd9f62                       2 months ago                      720MB  
busybox                                   latest                             a416a98b71e2                       2 months ago                      4.26MB  
docketeerxiv/node-exporter-extension      latest                             5403b019f9f7                       2 months ago                      22.8MB  
gcr.io/k8s-minikube/kicbase               v0.0.40                            c6cc01e60919                       2 months ago                      1.19GB  
hubproxy.docker.internal:5555/docker/desktop-kubernetes  v1.27.2-cni-v1.2.0-critools-v1.27.0-cni-dockerd-v0.3.2-1-debian c763812a4530                       3 months ago                      418MB  
registry.k8s.io/kube-apiserver            v1.27.2                             c5b13e4f7806                       4 months ago                      121MB  
registry.k8s.io/kube-scheduler            v1.27.2                             89e70da428d2                       4 months ago                      58.4MB  
registry.k8s.io/kube-controller-manager   v1.27.2                             ac2b7465ebba                       4 months ago                      112MB  
registry.k8s.io/kube-proxy                v1.27.2                             b8ae50768fd6                       4 months ago                      71.1MB  
docker/desktop-vpnkit-controller          dc331cb22850be0cdd97c84a9cfecaf44a1afb6e 556098075b3d                       4 months ago                      36.2MB  
registry.k8s.io/coredns/coredns          v1.10.1                             ead0a4e53df8                       7 months ago                      53.6MB  
registry.k8s.io/etcd                     3.5.7-0                             86b6af7dd652                       8 months ago                      296MB  
docketeerxiv/cadvisor-extension          latest                             3c4855e64666                       8 months ago                      87.3MB  
registry.k8s.io/pause                    3.9                                 e6f181688397                       11 months ago                     744kB  
docker/desktop-storage-provisioner        v2.0                                99f89471f470                       2 years ago                       41.9MB  
  
yash@haribol64 in ~ took 17ms  
└─ docker run busybox  
  
yash@haribol64 in ~ took 298ms  
└─ docker ps -a  
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES  
6162cfbb085a   busybox                            "sh"                   6 seconds ago   Exited (0) 5 seconds ago           festive_kirch  
4cd7ddf199f    gcr.io/k8s-minikube/kicbase:v0.0.40 "/usr/local/bin/entr..." 4 days ago     Exited (130) 4 hours ago           minikube  
  
yash@haribol64 in ~ took 21ms  
└─
```

```
yash@haribol64 in ~ took 5ms  
└─ docker image ls  
REPOSITORY                                TAG                                IMAGE ID                            CREATED                            SIZE  
docketeerxiv/docketeer-extension          14.0.1                            22d9f48f97fa                       5 weeks ago                       251MB  
docketeerxiv/prometheus-extension         latest                             162bc37e7bac                       5 weeks ago                       245MB  
docketeerxiv/grafana-extension            latest                             44f287518aa0                       5 weeks ago                       336MB  
codercom/code-server                     4.16.1                             1a335bfd9f62                       2 months ago                      720MB  
busybox                                   latest                             a416a98b71e2                       2 months ago                      4.26MB  
docketeerxiv/node-exporter-extension      latest                             5403b019f9f7                       2 months ago                      22.8MB  
gcr.io/k8s-minikube/kicbase               v0.0.40                            c6cc01e60919                       2 months ago                      1.19GB  
hubproxy.docker.internal:5555/docker/desktop-kubernetes  v1.27.2-cni-v1.2.0-critools-v1.27.0-cni-dockerd-v0.3.2-1-debian c763812a4530                       3 months ago                      418MB  
registry.k8s.io/kube-apiserver            v1.27.2                             c5b13e4f7806                       4 months ago                      121MB  
registry.k8s.io/kube-scheduler            v1.27.2                             89e70da428d2                       4 months ago                      58.4MB  
registry.k8s.io/kube-controller-manager   v1.27.2                             ac2b7465ebba                       4 months ago                      112MB  
registry.k8s.io/kube-proxy                v1.27.2                             b8ae50768fd6                       4 months ago                      71.1MB  
docker/desktop-vpnkit-controller          dc331cb22850be0cdd97c84a9cfecaf44a1afb6e 556098075b3d                       4 months ago                      36.2MB  
registry.k8s.io/coredns/coredns          v1.10.1                             ead0a4e53df8                       7 months ago                      53.6MB  
registry.k8s.io/etcd                     3.5.7-0                             86b6af7dd652                       8 months ago                      296MB  
docketeerxiv/cadvisor-extension          latest                             3c4855e64666                       8 months ago                      87.3MB  
registry.k8s.io/pause                    3.9                                 e6f181688397                       11 months ago                     744kB  
docker/desktop-storage-provisioner        v2.0                                99f89471f470                       2 years ago                       41.9MB  
  
yash@haribol64 in ~ took 18ms  
└─ docker ps -a  
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES  
6162cfbb085a   busybox                            "sh"                   3 minutes ago   Exited (0) 3 minutes ago           festive_kirch  
4cd7ddf199f    gcr.io/k8s-minikube/kicbase:v0.0.40 "/usr/local/bin/entr..." 4 days ago     Exited (130) 4 hours ago           minikube  
  
yash@haribol64 in ~ took 18ms  
└─ docker rename festive_kirch p11-1  
  
yash@haribol64 in ~ took 25ms  
└─ docker ps -a  
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES  
6162cfbb085a   busybox                            "sh"                   5 minutes ago   Exited (0) 5 minutes ago           p11-1  
4cd7ddf199f    gcr.io/k8s-minikube/kicbase:v0.0.40 "/usr/local/bin/entr..." 4 days ago     Exited (130) 4 hours ago           minikube  
  
yash@haribol64 in ~ took 20ms  
└─
```

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3. Run a container from the image and enter the BusyBox shell.



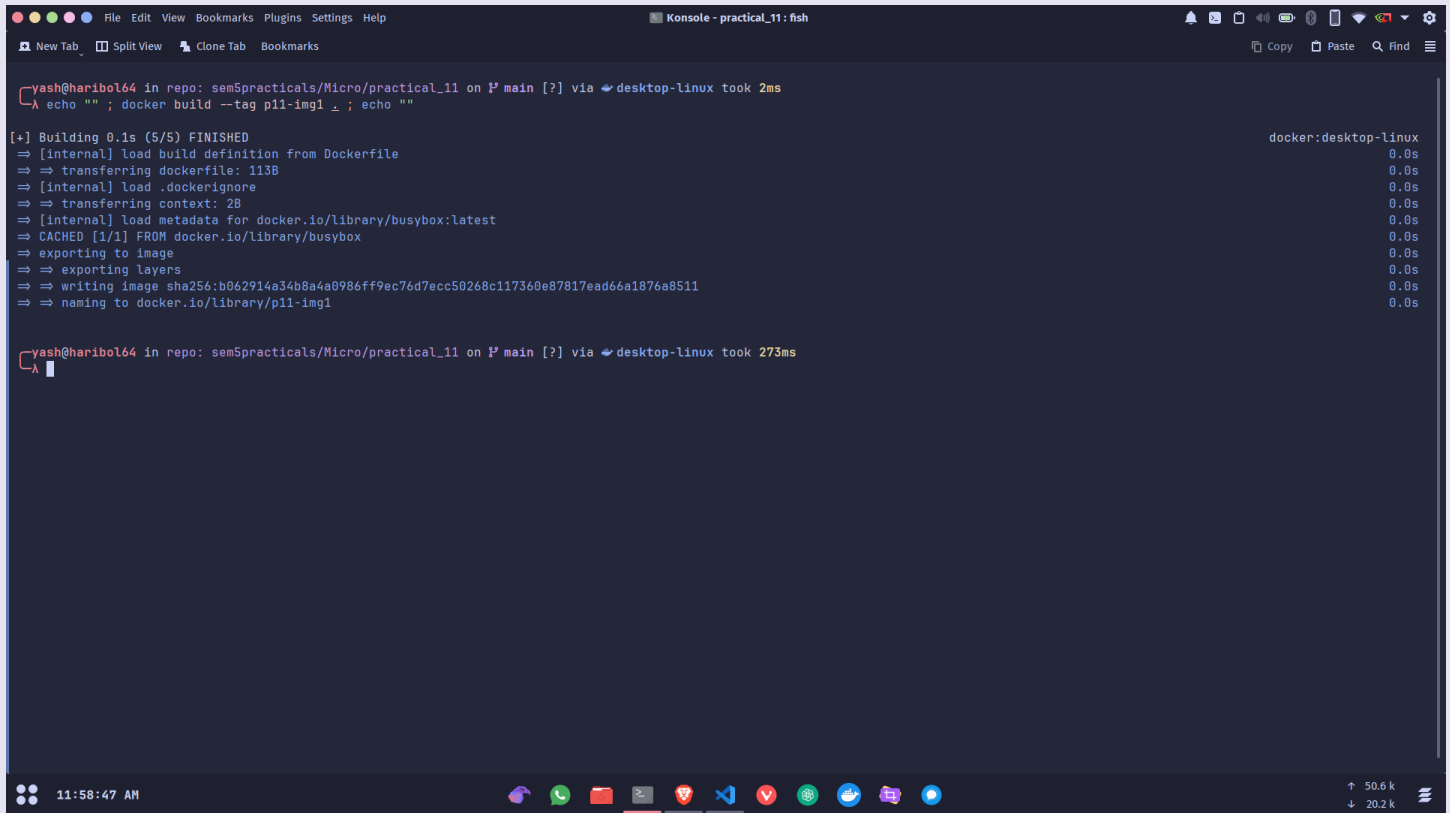
```
yash@haribol64 in ~ took 2ms
^ docker run -it --rm busybox
/ # ls
bin      dev      etc      home     lib      lib64    proc    root     sys      tmp      usr      var
/ # echo "Hare Krishna!"
Hare Krishna!
/ # ps
PID   USER     TIME   COMMAND
  1  root      0:00   sh
   8  root      0:00   ps
/ # echo "Linux command line in container built from busybox"
Linux command line in container built from busybox
/ # exit

yash@haribol64 in ~ took 39s
```

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4. Create an image to do something useful that you can share with others.

```
FROM busybox  
  
LABEL yash, yashlakhtariya1010@gmail.com
```



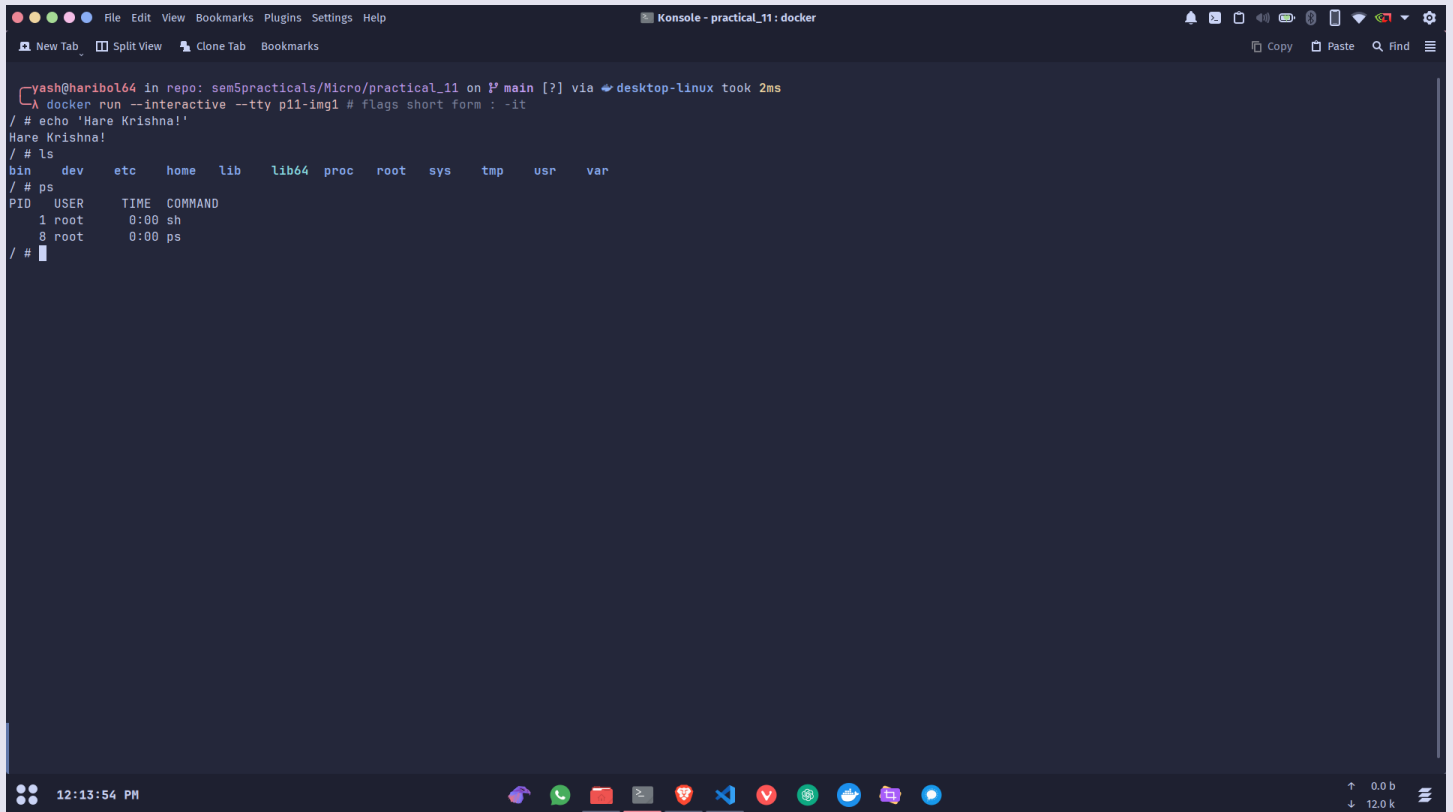
```
Konsole - practical_11: fsh  
New Tab Split View Clone Tab Bookmarks Copy Paste Find  
yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 2ms  
echo "" ; docker build --tag p11-img1 . ; echo ""  
[+] Building 0.1s (5/5) FINISHED  
=> [internal] load build definition from Dockerfile  
=> => transferring dockerfile: 113B  
=> [internal] load .dockerignore  
=> => transferring context: 2B  
=> [internal] load metadata for docker.io/library/busybox:latest  
=> CACHED [1/1] FROM docker.io/library/busybox  
=> exporting to image  
=> => exporting layers  
=> => writing image sha256:b062914a34b8a6a0986ff9ec76d7ecc50268c117360e87817ead66a1876a8511  
=> => naming to docker.io/library/p11-img1  
yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 273ms  
11:58:47 AM  
50.6 k  
20.2 k
```

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The screenshot shows a terminal window titled "Konsole - practical_11: docker". The terminal output is as follows:

```
yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 2ms
# docker run --interactive --tty p11-img1 # flags short form : -it
# echo 'Hare Krishna!'
Hare Krishna!
# ls
bin      dev      etc      home    lib      lib64    proc    root    sys      tmp      usr      var
# ps
PID  USER  TIME  COMMAND
1    root   0:00  sh
8    root   0:00  ps
#
```

The terminal window has a menu bar with "File", "Edit", "View", "Bookmarks", "Plugins", "Settings", and "Help". The status bar at the bottom shows the time "12:13:54 PM" and system resources: "0.0 b" (up) and "12.0 k" (down).

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5. Show all containers that are currently running.

```
yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 2ms
A docker run --interactive --tty p11-img1 # flags short form : -it
/# echo 'Hare Krishna!'
Hare Krishna!
/# ls
bin      dev      etc      home     lib      lib64    proc     root     sys      tmp      usr      var
/# ps
PID      USER     TIME    COMMAND
1 root    0:00    sh
8 root    0:00    ps
/# exit

yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 6m16s
A docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS              PORTS          NAMES
73f97d189500   p11-img1      "sh"                    6 minutes ago Exited (0) 2 seconds ago           kind_dirac
7cf31db2a579   busybox       "ls"                    24 hours ago  Exited (0) 24 hours ago           p11-2
6162cfbb085a   busybox       "sh"                    24 hours ago  Exited (0) 24 hours ago           p11-1
4cd7ddf199f    gcr.io/k8s-minikube/kicbase:v0.0.40 "/usr/local/bin/entr..." 5 days ago    Exited (130) 28 hours ago          minikube

yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 21ms
A docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS              PORTS          NAMES

yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 18ms
A
```

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6. Delete images that you no longer need.

```
yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 2ms
^ docker rmi p11-img1
Untagged: p11-img1:latest
Deleted: sha256:5169880ee63e27ff7c41cffbea018911db6b98a2a73459d016fc7f9fa9b669c8

yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 23ms
^ docker image ls
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
docketeerxiv/docketeer-extension	14.0.1	22d9f48f97fa	5 weeks ago	251MB
docketeerxiv/prometheus-extension	latest	162bc37e7bac	5 weeks ago	245MB
docketeerxiv/grafana-extension	latest	44f287518aa0	5 weeks ago	336MB
coderecom/code-server	4.16.1	1a335bfd9f62	2 months ago	720MB
busybox	latest	a416a98b71e2	2 months ago	4.26MB
<none>	<none>	b062914a34b8	2 months ago	4.26MB
docketeerxiv/node-exporter-extension	latest	5403b019f9f7	2 months ago	22.8MB
gcr.io/k8s-minikube/kicbase	v0.0.40	c6cc01e60919	2 months ago	1.19GB
hubproxy.docker.internal:5555/docker/desktop-kubernetes	kubernetes-v1.27.2-cni-v1.2.0-critools-v1.27.0-cri-dockerd-v0.3.2-1-debian	c763812a4530	3 months ago	418MB
registry.k8s.io/kube-apiserver	v1.27.2	c5b13e4f7806	4 months ago	121MB
registry.k8s.io/kube-scheduler	v1.27.2	89e70da428d2	4 months ago	58.4MB
registry.k8s.io/kube-controller-manager	v1.27.2	ac2b7465ebba	4 months ago	112MB
registry.k8s.io/kube-proxy	v1.27.2	b8aa50768fd6	4 months ago	71.1MB
docker/desktop-vpnkit-controller	dc331cb22850be0cdd97c84a9cfecaf44a1afb6e	556098075b3d	4 months ago	36.2MB
registry.k8s.io/coredns/coredns	v1.10.1	ead0a4a53df8	7 months ago	53.6MB
registry.k8s.io/etcd	3.5.7-0	86b6af7dd652	8 months ago	296MB
docketeerxiv/cadvisor-extension	latest	3c4855e64666	8 months ago	87.3MB
registry.k8s.io/pause	3.9	e6f181688397	11 months ago	744kB
docker/desktop-storage-provisioner	v2.0	99f89471f470	2 years ago	41.9MB

```
yash@haribol64 in repo: sem5practicals/Micro/practical_11 on P main [?] via desktop-linux took 16ms
```