

## Problem 1

- Run the container hello-world

```
aya@aya-virtual-machine:~/Desktop$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:ac69084025c660510933cca701f615283cdbb3aa0963188770b54c31c8962493
Status: Downloaded newer image for hello-world:latest

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.
   (and64)
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/
```

- Check the container status

```
aya@aya-virtual-machine:~/Desktop$ sudo docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS   NAMES
41f30f377885   hello-world    "/hello"                 3 minutes ago   Exited (0)    3 minutes ago           nice_babbage
aya@aya-virtual-machine:~/Desktop$
```

- Start the stopped container

```
aya@aya-virtual-machine:~/Desktop$ sudo docker start 41f3
41f3
```

- Remove the container

```
aya@aya-virtual-machine:~/Desktop$ sudo docker rm c7b1
c7b1
```

- Remove the image

```
aya@aya-virtual-machine:~/Desktop$ sudo docker image rm d2c9
Untagged: hello-world:latest
Untagged: hello-world@sha256:ac69084025c660510933cca701f615283cdbb3aa0963188770b54c31c8962493
Deleted: sha256:d2c94e258dcb3c5ac2798d32e1249e42ef01cba4841c2234249495f87264ac5a
Deleted: sha256:ac2880ec8bb38d5c35b49d45a6ac4777544941199075dff8c4eb63e093aa81e
```

## Problem 2

- Run container centos or ubuntu in an interactive

mode

- o Run the following command in the container

“echo docker ”

- o touch a file named hello-docker

```
aya@aya-virtual-machine:~/Desktop$ sudo docker run -it ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
a48641193673: Pull complete
Digest: sha256:6042500cf4b44023ea1894effe7890666b0c5c7871ed83a97c36c76ae560bb9b
Status: Downloaded newer image for ubuntu:latest
root@2569535006d2:/# echo docker
docker
root@2569535006d2:/# touch hello-docker
root@2569535006d2:/# ls
bin boot dev etc hello-docker home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr
root@2569535006d2:/#
```

- Stop the container and remove it.

- o What is your comment about the file hello-docker?

```
root@2569535006d2:/# exit
exit
aya@aya-virtual-machine:~/Desktop$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
2569535006d2   ubuntu   "/bin/bash"   2 minutes ago   Exited (0) 11 seconds ago           lucid_chandrasekhar
aya@aya-virtual-machine:~/Desktop$ sudo docker rm 2569
2569
aya@aya-virtual-machine:~/Desktop$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
aya@aya-virtual-machine:~/Desktop$ ls
archetc.tar dir1 dir2 docs f1 filink.txt f2 newcommands oldpasswd passwdcopy script tmp
aya@aya-virtual-machine:~/Desktop$
```

The hello-docker file which was created within the container is deleted as well.

- Remove all stopped containers

```
aya@aya-virtual-machine:~/Desktop$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
517d08536676   ubuntu   "/bin/bash"   3 minutes ago   Exited (0) 3 minutes ago           reverent_jennings
c138f0d9b457   ubuntu   "/bin/bash"   3 minutes ago   Exited (0) 3 minutes ago           stupefied_cohen
aya@aya-virtual-machine:~/Desktop$ sudo docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
517d0853667656c75975f6ba22c1e92718f87178f5c1f274111c37dc3e791694
c138f0d9b45717b53daab63ff67379ba6645a087272ec12f89e4f2fc6da67133

Total reclaimed space: 10B
aya@aya-virtual-machine:~/Desktop$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
aya@aya-virtual-machine:~/Desktop$
```

### Problem 3

- Run a container nginx with name mynginx and

attach a volume to the container

- o Volume for containing static html file

```
aya@aya-virtual-machine:~/Desktop$ sudo docker run -d --name mynginx -v /home/Desktop/myvolume:/usr/share/nginx/html nginx
3e42d2ce5f8dd299e92f8a807da7157de47e3c033eade71ab6794e1d3feeb922
aya@aya-virtual-machine:~/Desktop$ cd newcommands/
aya@aya-virtual-machine:~/Desktop/newcommands$ ls
1 cl f1 f2 mtemplate myarray myavr mybackup mycase mycd mychmod mycp myinfo myls mymail mymenu mytest s1 s2 script script2
aya@aya-virtual-machine:~/Desktop/newcommands$ cd ../myvolume/
aya@aya-virtual-machine:~/Desktop/myvolume$ ls
index.html
```

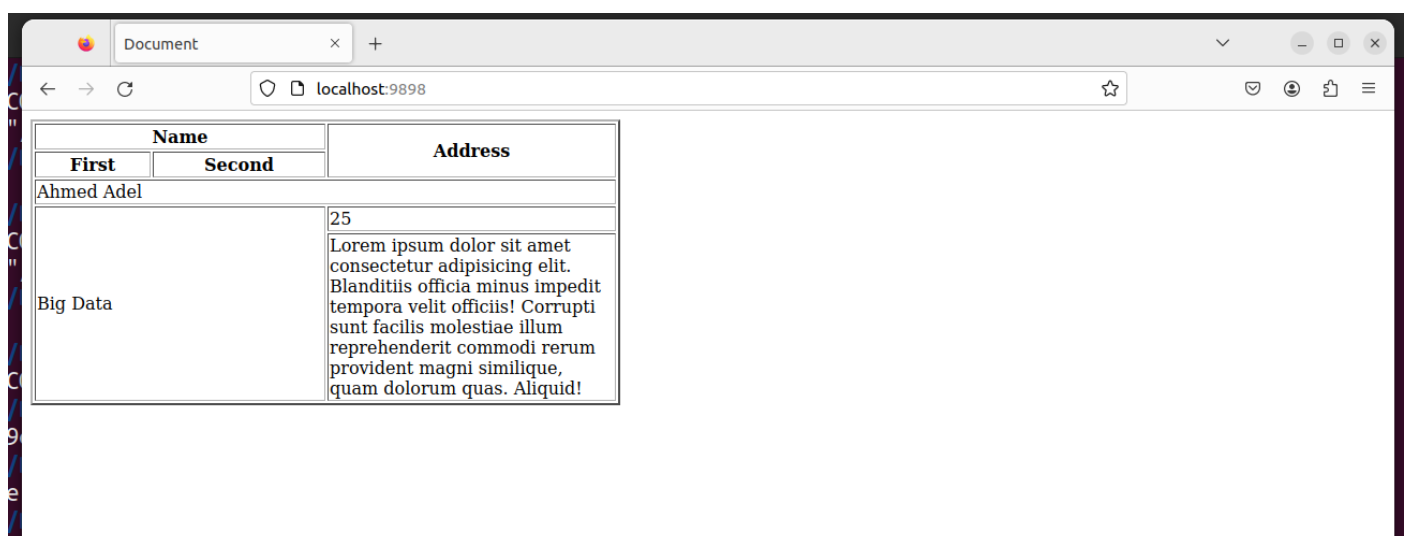
- Remove the container

```
aya@aya-virtual-machine:~/Desktop/myvolume$ sudo docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS      NAMES
3e42d2ce5f8d   nginx    "/docker-entrypoint..." 2 minutes ago  Up 2 minutes  80/tcp     mynginx
aya@aya-virtual-machine:~/Desktop/myvolume$ sudo docker stop 3e42
3e42
aya@aya-virtual-machine:~/Desktop/myvolume$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS      NAMES
3e42d2ce5f8d   nginx    "/docker-entrypoint..." 4 minutes ago  Exited (0)    13 seconds ago
aya@aya-virtual-machine:~/Desktop/myvolume$ sudo docker rm 3e4
3e4
aya@aya-virtual-machine:~/Desktop/myvolume$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS      NAMES
aya@aya-virtual-machine:~/Desktop/myvolume$
```

- Run a new container with the following:

- o Attach the volume that was attached to the previous container
- o Map port 80 to port 9898 on you host machine
- o Access the html files from your browser

```
761
aya@aya-virtual-machine:~/Desktop/myvolume$ sudo docker run -d -p 9898:80 -v /home/aya/Desktop/myvolume:/usr/share/nginx/html nginx
e8dd3fb2971add1ee1eb45e3741ebe0d0e3dd2c3801bd0fffd9a3ecf1e54b530a
aya@aya-virtual-machine:~/Desktop/myvolume$
```



#### Problem 4

- Run a container using nginx image "without attaching any volumes"

```
aya@aya-virtual-machine:~/Desktop$ sudo docker run -d -p 8080:80 --name newnginx nginx  
ebcb5ad4bd7e1433730caade8696ff608a9481a0a8684df9d194d49125939b83
```

- Add html static files to the container and make sure they are accessible

```
aya@aya-virtual-machine:~/Desktop$ sudo docker exec -i -t newnginx sh  
# pwd  
/  
# touch index.html
```

- Commit the container with image name "my-nginx"
- Run new container with the new image my-nginx
  - o What will happen to the static file?

```
aya@aya-virtual-machine:~/Desktop$ sudo docker commit ebcb5ad4bd7e my-nginx  
sha256:5df0250ede31d48756db0e6f57bd708eed4d2b2bb62e08fa8db40e2b74e6a21a  
aya@aya-virtual-machine:~/Desktop$ sudo docker run -d -p 8000:80 --name subnginx my-nginx  
d76c2c8809a2a6f7f6ffb163a785fad34d6b1746c3bd0d508956d76a7a47a346
```

```
aya@aya-virtual-machine:~/Desktop$ sudo docker exec -i -t subnginx /bin/bash  
root@d76c2c8809a2:/# ls  
bin    dev          docker-entrypoint.sh  home      lib      lib64    media  opt    root  sbin  sys  usr  
boot  docker-entrypoint.d  etc          index.html  lib32    libx32  mnt    proc  run  srv  tmp  var  
root@d76c2c8809a2:/#
```

The index.html file which was created within the container of the nginx image is inside the other container that is an instance of the new image we committed.

## Problem 5

- Create a volume called `mysql_data`, then deploy a MySQL database called `app-database`. Use the `mysql` latest image, and use the `-e` flag to set `MYSQL_ROOT_PASSWORD` to `P4sSw0rd0!.M`ount the `mysql_data` volume to `/var/lib/mysql`. The container should run in the background.

```
aya@aya-virtual-machine:~/Desktop$ mkdir mysql_data
aya@aya-virtual-machine:~/Desktop$ sudo docker run --name app-database -e MYSQL_ROOT_PASSWORD=P4sSw0rd0!.M -v ~/Desktop:/var/lib/mysql -d mysql:latest
[sudo] password for aya:
Unable to find image 'mysql:latest' locally
latest: Pulling from library/mysql
bce031bc522d: Pull complete
cf7e9f463619: Pull complete
105f403783c7: Pull complete
878e53a613d8: Pull complete
2a362044e79f: Pull complete
6e4df4f73cfe: Pull complete
69263d634755: Pull complete
fe5e85549202: Pull complete
5c02229ce6f1: Pull complete
7320aa32bf42: Pull complete
Digest: sha256:4ef30b2c11a3366d7bb9ad95c70c0782ae435df52d046553ed931621ea36ffa5
Status: Downloaded newer image for mysql:latest
4cec28d440dc6c16387454f8726b38cd7f50aa4d4dfb092a3c0cee365719a5d7
aya@aya-virtual-machine:~/Desktop$
```