# Exercise 2: Changing images

- How to modify an existing Docker image, and commit it as a new one.
- Firstly, pulling and starting the container with the interactive bash environment.

```
alap@sf-cpu-036:~/Exercises-docker$ docker pull ubuntu:22.04
22.04: Pulling from library/ubuntu
2ab09b027e7f: Pull complete
Digest: sha256:67211c14fa74f070d27cc59d69a7fa9aeff8e28ea118ef3babc295a0428a6d21
Status: Downloaded newer image for ubuntu:22.04
docker.io/library/ubuntu:22.04
alap@sf-cpu-036:~/Exercises-docker$ docker run -it ubuntu:22.04 bash
```

- Inside the container if we try to use ping command for www.google.com, it will show error that ping command not found.

```
alap@sf-cpu-036:~/Exercises-docker$ docker run -it ubuntu:22.04 bash
root@fc2dc9269e1b:/# ping www.google.com
bash: ping: command not found
```

- Now, for installing ping command we need to update the container using apt-get update and then running the command apt-get install iputils-ping.

```
root@fc2dc9269e1b:/# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu jammy InRelease [270 kB]
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [911 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy/restricted amd64 Packages [164 kB]
Get:7 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [1000 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [17.5 MB]
Get:9 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [23.2 kB]
Get:10 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [959 kB]
Get:11 http://archive.ubuntu.com/ubuntu jammy/main amd64 Packages [1792 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [266 kB]
Get:13 http://archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [28.6 kB]
Get:14 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1153 kB]
Get:15 http://archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [1054 kB]
Get:16 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1301 kB]
Get:17 http://archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [25.6 kB]
Get:18 http://archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [49.4 kB]
Fetched 26.8 MB in 10s (2558 kB/s)
Reading package lists... Done
```

```
root@fc2dc9269e1b:/# apt-get install iputils-ping
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```

- Now, if we run ping command with www.google.com, we can see the ping command is running.

```
root@fc2dc9269e1b:/# ping www.google.com
PING www.google.com (142.250.199.164) 56(84) bytes of data.
64 bytes from bom07s37-in-f4.1e100.net (142.250.199.164): icmp_seq=1 ttl=57 time=9.50 ms
64 bytes from bom07s37-in-f4.1e100.net (142.250.199.164): icmp_seq=2 ttl=57 time=9.49 ms
^C
--- www.google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 9.494/9.497/9.500/0.003 ms
```

- We will commit these change we have made in this container using docker commit command after exiting from the container.
- Installing ping isn't very special in itself. But what if you wanted to have ping on all of your ubuntu containers? You'd have to redo this installation each time you spin up a new container, and that isn't much fun.
- The Docker way is to create a new image. There are two ways to do this: 1) build a new image from scratch or 2) commit a container state as a new image.
- Docker commit command consists of author name, commit message, and giving it a new image name.

```
root@fc2dc9269e1b:/# exit
exit
alap@sf-cpu-036:~/Exercises-docker$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
alap@sf-cpu-036:~/Exercises-docker$ docker ps -a
CONTAINER ID   IMAGE          COMMAND   CREATED              STATUS                      PORTS     NAMES
fc2dc9269e1b   ubuntu:22.04   "bash"    About a minute ago   Exited (0) 6 seconds ago              crazy_germain
alap@sf-cpu-036:~/Exercises-docker$ docker commit -a 'Alap Pandya' -m 'Added ping utility.' fc2 alappandya05/ping
sha256:6dbcdc89637fd8192f9e511916cbffb798dadfb446f8811fb0ecedd3fea61c41
```

- Now, we can see the new image with docker images command and then run with the docker run command and we can see the ping command is successfully running without installing it.

```
alap@sf-cpu-036:~/Exercises-docker$ docker images
REPOSITORY          TAG       IMAGE ID       CREATED         SIZE
alappandya05/ping   latest    6dbcdc89637f   9 seconds ago   123MB
ubuntu              22.04     08d22c0ceb15   6 weeks ago     77.8MB
alap@sf-cpu-036:~/Exercises-docker$ docker run alappandya05/ping
alap@sf-cpu-036:~/Exercises-docker$ docker run -it  alappandya05/ping bash
root@96ee9da58ccb:/# ping www.google.com
PING www.google.com (142.250.183.164) 56(84) bytes of data.
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=1 ttl=57 time=9.32 ms
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=2 ttl=57 time=9.39 ms
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=3 ttl=57 time=10.0 ms
^C
--- www.google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 9.322/9.583/10.043/0.325 ms
root@96ee9da58ccb:/# exit
exit
```