

1. Docker installation: Install Docker on your local system (Windows, macOS, or Linux). Verify the installation by running the `docker --version` and `docker info` commands.

```
root@Nilam:~# docker --version
Docker version 24.0.7, build afdd53b

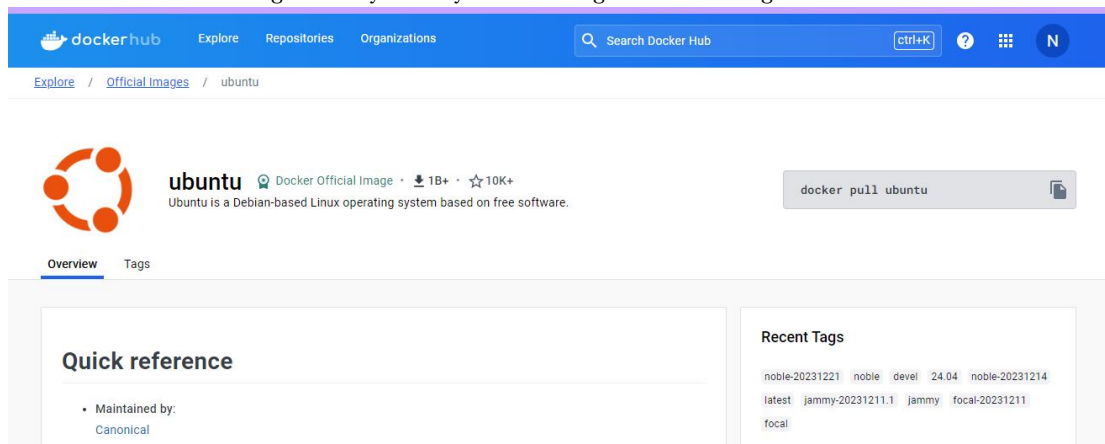
root@Nilam:~# docker

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers

Common Commands:
run      Create and run a new container from an image
exec     Execute a command in a running container
ps       List containers
build    Build an image from a Dockerfile
pull     Download an image from a registry
push     Upload an image to a registry
images   List images
login    Log in to a registry
logout   Log out from a registry
search   Search Docker Hub for images
```

2. Working with Docker images: Search for the official Ubuntu image on Docker Hub, pull it to your local system using `docker pull`, and list all available images on your system using `docker images`.



The screenshot shows the Docker Hub interface for the 'ubuntu' image. The header includes the Docker Hub logo, navigation links (Explore, Repositories, Organizations), a search bar, and user controls. The main content area features the Ubuntu logo, the text 'ubuntu Docker Official Image', and a 'docker pull ubuntu' button. Below this, there are tabs for 'Overview' and 'Tags'. The 'Overview' tab is active, showing a 'Quick reference' section with the note 'Maintained by: Canonical'. To the right, a 'Recent Tags' section lists various image versions like 'noble-20231221', 'noble', 'devel', '24.04', 'noble-20231214', 'latest', 'jammy-20231211.1', 'jammy', 'focal-20231211', and 'focal'.

```
root@Nilam:~# docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
Digest: sha256:604250cf4b44023ea1894effe789066b0c5c7871ed83a97c36c76ae560bb9b
Status: Image is up to date for ubuntu:latest
docker.io/library/ubuntu:latest
root@Nilam:~#
```

```
root@Nilam:~# docker image ls
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
ubuntu        latest    174c8c134b2a   3 weeks ago   77.9MB
nginx         latest    d453dd892d93   2 months ago  187MB
httpd         latest    6fd77d7e5eb7   2 months ago  167MB
root@Nilam:~#
```

3. Creating a Docker container: Run a Docker container using the Ubuntu image, and execute a command inside the container (e.g., echo "Hello, Docker!").

```
root@Nilam:~# docker image pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
a48641193673: Pull complete
Digest: sha256:6042500cf4b44023ea1894effe7890666b0c5c7871ed83a97c36c76ae560bb9b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

```
root@Nilam:~# docker image ls
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
ubuntu	latest	174c8c134b2a	3 weeks ago	77.9MB
nginx	latest	d453dd892d93	2 months ago	187MB

```
root@Nilam:~#
```

```
root@Nilam:~# docker container run ubuntu
root@Nilam:~# docker container ls
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
13fdf46eb4ae	nginx	"/docker-entrypoint..."	18 minutes ago	Up 18 minutes	0.0.0.0:89->80/tcp, :::89->80/tcp	Nilam1
2c94dc1cd3c4	nginx	"/docker-entrypoint..."	22 minutes ago	Up 22 minutes	0.0.0.0:87->80/tcp, :::87->80/tcp	Nilam

```
root@Nilam:~# docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1e8a13f1bc10	ubuntu	"/bin/bash"	21 seconds ago	Exited (0) 20 seconds ago		quirky_payne
13fdf46eb4ae	nginx	"/docker-entrypoint..."	18 minutes ago	Up 18 minutes	0.0.0.0:89->80/tcp, :::89->80/tcp	Nilam1
2c94dc1cd3c4	nginx	"/docker-entrypoint..."	22 minutes ago	Up 22 minutes	0.0.0.0:87->80/tcp, :::87->80/tcp	Nilam

```
root@Nilam:~#
```

```
root@Nilam:~# docker container run -itd --name myubuntu ubuntu
cd86416144c5029226297c0d0a4f9e84ad2b2a71c498833a2dd79286e56d2a15
root@Nilam:~# docker container ls
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cd86416144c5	ubuntu	"/bin/bash"	5 seconds ago	Up 3 seconds		myubuntu
13fdf46eb4ae	nginx	"/docker-entrypoint..."	27 minutes ago	Up 27 minutes	0.0.0.0:89->80/tcp, :::89->80/tcp	Nilam1
2c94dc1cd3c4	nginx	"/docker-entrypoint..."	31 minutes ago	Up 31 minutes	0.0.0.0:87->80/tcp, :::87->80/tcp	Nilam

```
root@Nilam:~# docker container exec -it 1e8a13f1bc10 /bin/bash
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cd86416144c5	ubuntu	"/bin/bash"	5 seconds ago	Up 3 seconds		myubuntu
13fdf46eb4ae	nginx	"/docker-entrypoint..."	27 minutes ago	Up 27 minutes	0.0.0.0:89->80/tcp, :::89->80/tcp	Nilam1
2c94dc1cd3c4	nginx	"/docker-entrypoint..."	31 minutes ago	Up 31 minutes	0.0.0.0:87->80/tcp, :::87->80/tcp	Nilam

```
root@cd86416144c5:/# echo "Hello Docker "
```

Hello Docker

```
root@cd86416144c5:/#
```

4. Inspect the Ubuntu Docker container to ensure it is in the "created" state only.

```
root@Nilam:~# docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
cd86416144c5	ubuntu	"/bin/bash"	11 minutes ago	Up 11 minutes		myubuntu
1e8a13f1bc10	ubuntu	"/bin/bash"	20 minutes ago	Exited (0) 12 minutes ago		quirky_payne
13fdf46eb4ae	nginx	"/docker-entrypoint..."	38 minutes ago	Up 38 minutes	0.0.0.0:89->80/tcp, :::89->80/tcp	Nilam1
2c94dc1cd3c4	nginx	"/docker-entrypoint..."	42 minutes ago	Up 42 minutes	0.0.0.0:87->80/tcp, :::87->80/tcp	Nilam

```
root@Nilam:~#
```

```
root@Nilam:~# docker container inspect cd86416144c5
```

```
[
  {
    "Id": "cd86416144c5029226297c0d0a4f9e84ad2b2a71c498833a2dd79286e56d2a15",
    "Created": "2024-01-09T08:28:05.638722542Z",
    "Path": "/bin/bash",
    "Args": [],
    "State": {
      "Status": "running",
      "Running": true,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 11417,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2024-01-09T08:28:06.09059978Z",
      "FinishedAt": "0001-01-01T00:00:00Z"
    }
  },
]
```

5. Execute the Ubuntu Docker container and confirm that the container's state is "running."

```
root@Nilam:/# docker container ls
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
cd86416144c5   ubuntu    "/bin/bash"             14 minutes ago Up 14 minutes                               myubuntu
13fdf46eb4ae   nginx     "/docker-entrypoint..." 42 minutes ago Up 42 minutes   0.0.0.0:89->80/tcp, :::89->80/tcp   Nilam1
2c94dc1cd3c4   nginx     "/docker-entrypoint..." 45 minutes ago Up 45 minutes   0.0.0.0:87->80/tcp, :::87->80/tcp   Nilam
root@Nilam:/#
```

6. Launch an HTTP container, verify its state, and then remove the container and image from your local system.

```
root@Nilam:/# docker image ls
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
ubuntu        latest    174c8c134b2a   3 weeks ago    77.9MB
nginx         latest    d453dd892d93   2 months ago   187MB
httpd         latest    6fd77d7e5eb7   2 months ago   167MB
```

```
root@Nilam:/# docker run -d --name my-http3993-container -p 8080:80 httpd
25bc715fb4e020cd91a196cf85e814dd1054a42e69ab1217baad80ee81dc1c24
root@Nilam:/#
root@Nilam:/#
```

```
root@Nilam:/# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
25bc715fb4e0   httpd     "httpd-foreground"       11 seconds ago Up 10 seconds   0.0.0.0:8080->80/tcp, :::8080->80/tcp   my-http3993-container
cd86416144c5   ubuntu    "/bin/bash"             20 minutes ago Up 20 minutes                               myubuntu
```

```
root@Nilam:/# docker stop my-http3993-container
my-http3993-container
root@Nilam:/# docker rm my-http3993-container
my-http3993-container
root@Nilam:/#
```

7. Execute a command to display a filtered list of containers, showing only their short container IDs.

```
root@Nilam:/# docker ps -q
cd86416144c5
13fdf46eb4ae
2c94dc1cd3c4
root@Nilam:/#
```