

Lab Exercise 1- Docker Fundamental Commands

Objective

Learn and practice the fundamental Docker CLI commands to:

- Manage images and containers
 - Understand container lifecycle
 - Build and run applications using Docker
-

1. Setup

Prerequisites

- Docker installed on your system
(Check using: docker --version)
 - Internet access to pull images
-

2. Basic Docker Commands

Step 1: Verify Installation

```
docker --version  
docker info
```

```
[mohdanas@Mohds-MacBook-Air ~ % docker info
Client:
  Version:  28.3.2
  Context:  desktop-linux
  Debug Mode: false
  Plugins:
    ai: Docker AI Agent - Ask Gordon (Docker Inc.)
      Version: v1.6.0
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-ai
    buildx: Docker Buildx (Docker Inc.)
      Version: v0.25.0-desktop.1
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-buildx
    cloud: Docker Cloud (Docker Inc.)
      Version: v0.4.2
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-cloud
    compose: Docker Compose (Docker Inc.)
      Version: v2.38.2-desktop.1
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-compose
    debug: Get a shell into any image or container (Docker Inc.)
      Version: 0.0.41
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-debug
    desktop: Docker Desktop commands (Docker Inc.)
      Version: v0.1.11
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-desktop
    extension: Manages Docker extensions (Docker Inc.)
      Version: v0.2.29
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-extension
    init: Creates Docker-related starter files for your project (Docker Inc.)
      Version: v1.4.0
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-init
    mcp: Docker MCP Plugin (Docker Inc.)
      Version: v0.9.9
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-mcp
    model: Docker Model Runner (EXPERIMENTAL) (Docker Inc.)
      Version: v0.1.33
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-model
    sbom: View the packaged-based Software Bill Of Materials (SBOM) for an image (Anchore Inc.)
      Version: 0.6.0
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-sbom
    scout: Docker Scout (Docker Inc.)
      Version: v1.18.1
      Path:  /Users/mohdanas/.docker/cli-plugins/docker-scout
```

Step 2: Pull an Image from Docker Hub

```
docker pull ubuntu:latest
```

Explanation: Downloads the latest Ubuntu image from Docker Hub.

```
[mohdanas@Mohds-MacBook-Air ~ % docker pull ubuntu:latest
latest: Pulling from library/ubuntu
36bf709aa36d: Pull complete
Digest: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

Check available images:

```
docker images
```

```
[mohdanas@Mohds-MacBook-Air ~ % docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
ubuntu          latest   cd1dba651b30   5 days ago   139MB
nginx-html-app  latest   174b9ceb80b6   2 months ago  244MB
```

Step 3: Run a Container

Run Ubuntu interactively:

```
docker run -it --name myubuntu ubuntu bash
```

```
[mohdanas@Mohds-MacBook-Air ~ % docker run -it --name myubuntu ubuntu bash
[root@5d9a89598e1c:/# ls
bin  dev  home  media  opt  root  sbin  sys  usr
boot  etc  lib  mnt  proc  run  srv  tmp  var
[root@5d9a89598e1c:/# mkdir Hello
[root@5d9a89598e1c:/# ls
Hello  boot  etc  lib  mnt  proc  run  srv  tmp  var
bin  dev  home  media  opt  root  sbin  sys  usr
```

Now you're inside a running container (prompt will change).

Exit:

```
exit
```

```
[root@5d9a89598e1c:/Hello# exit
exit
mohdanas@Mohds-MacBook-Air ~ %
```

Step 4: List Containers

- Show running containers:

```
docker ps
```

- Show all containers (including stopped):

```
docker ps -a
```

```
[mohdanas@Mohds-MacBook-Air ~ % docker ps
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
[mohdanas@Mohds-MacBook-Air ~ % docker ps -a
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
S      NAMES
5d9a89598e1c  ubuntu      "bash"      5 minutes ago  Exited (127) About a minute ago
      myubuntu
mohdanas@Mohds-MacBook-Air ~ %
```

Step 5: Start / Stop / Remove Containers

```
# Start a stopped container

docker start <container_id>

# Stop a running container

docker stop <container_id>

# Remove a container

docker rm <container_id>
```

Tip: Use docker ps -a to get container IDs.

```
[mohdanas@Mohds-MacBook-Air ~ % docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
[mohdanas@Mohds-MacBook-Air ~ % docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5d9a89598e1c ubuntu "bash" 5 minutes ago Exited (127) About a minute ago
[mohdanas@Mohds-MacBook-Air ~ % docker start 5d9a89598e1c
5d9a89598e1c
[mohdanas@Mohds-MacBook-Air ~ % docker stop 5d9a89598e1c
5d9a89598e1c
[mohdanas@Mohds-MacBook-Air ~ % docker rm 5d9a89598e1c
5d9a89598e1c
[mohdanas@Mohds-MacBook-Air ~ % docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
```

Step 6: Remove Images

```
docker rmi ubuntu:latest
```

Note: You must stop and remove all containers using that image first.

```
[mohdanas@Mohds-MacBook-Air ~ % docker rmi ubuntu:latest
Untagged: ubuntu:latest
Deleted: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
```