

# Lab Exercise 1- Docker Fundamental

## Commands

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### 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

*Expected Output:* Docker version and system details.

```
C:\Users\ASUS>docker --version
Docker version 28.5.1, build e180ab8

C:\Users\ASUS>docker info
Client:
Version:      28.5.1
Context:      desktop-linux
Debug Mode:   false
Plugins:
ai: Docker AI Agent - Ask Gordon (Docker Inc.)
  Version:    v1.9.11
  Path:       C:\Program Files\Docker\cli-plugins\docker-ai.exe
buildx: Docker Buildx (Docker Inc.)
  Version:    v0.29.1-desktop.1
  Path:       C:\Program Files\Docker\cli-plugins\docker-buildx.exe
compose: Docker Compose (Docker Inc.)
  Version:    v2.40.3-desktop.1
  Path:       C:\Users\ASUS\.docker\cli-plugins\docker-compose.exe
debug: Get a shell into any image or container (Docker Inc.)
  Version:    0.0.45
  Path:       C:\Program Files\Docker\cli-plugins\docker-debug.exe
desktop: Docker Desktop commands (Docker Inc.)
  Version:    v0.2.0
  Path:       C:\Program Files\Docker\cli-plugins\docker-desktop.exe
extension: Manages Docker extensions (Docker Inc.)
  Version:    v0.2.31
  Path:       C:\Program Files\Docker\cli-plugins\docker-extension.exe
init: Creates Docker-related starter files for your project (Docker Inc.)
  Version:    v1.4.0
  Path:       C:\Program Files\Docker\cli-plugins\docker-init.exe
mcp: Docker MCP Plugin (Docker Inc.)
  Version:    v0.24.0
  Path:       C:\Program Files\Docker\cli-plugins\docker-mcp.exe
model: Docker Model Runner (Docker Inc.)
  Version:    v0.1.46
  Path:       C:\Users\ASUS\.docker\cli-plugins\docker-model.exe
offload: Docker Offload (Docker Inc.)
  Version:    v0.5.1
  Path:       C:\Program Files\Docker\cli-plugins\docker-offload.exe
sandbox: Docker Sandbox (Docker Inc.)
  Version:    v0.3.1
  Path:       C:\Program Files\Docker\cli-plugins\docker-sandbox.exe
sbom: View the packaged-based Software Bill Of Materials (SBOM) for an image (Anchore Inc.)
  Version:    0.6.0
  Path:       C:\Program Files\Docker\cli-plugins\docker-sbom.exe
scout: Docker Scout (Docker Inc.)
  Version:    v1.18.3
  Path:       C:\Program Files\Docker\cli-plugins\docker-scout.exe

Server:
error during connect: Get "http://%2F%2F.%2Fpipe%2FdockerDesktopLinuxEngine/v1.51/info": open //./pipe
/dockerDesktopLinuxEngine: The system cannot find the file specified.
```

## Step 2: Pull an Image from Docker Hub

```
docker pull ubuntu:latest
```

*Explanation:* Downloads the latest Ubuntu image from Docker Hub.

```
C:\Users\ASUS>docker pull ubuntu:latest
latest: Pulling from library/ubuntu
a3629ac5b9f4: Pull complete
Digest: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

Check available images:

docker images

```
C:\Users\ASUS>docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
ubuntu        latest    cd1dba651b30   2 weeks ago    117MB
nginx         latest    c881927c4077   2 weeks ago    237MB
```

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### Step 3: Run a Container

Run Ubuntu interactively:

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

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

```
C:\Users\ASUS>docker run -it --name myubuntu ubuntu bash
root@7cdded83b44e:/#
```

Exit:

Exit

```
C:\Users\ASUS>docker run -it --name myubuntu ubuntu bash
root@7cdded83b44e:/# exit
exit
```

---

## Step 4: List Containers

- Show running containers:

```
docker ps
```

```
C:\Users\ASUS>docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED         STATUS      PORTS      NAMES
```

- Show all containers (including stopped):

```
docker ps -a
```

```
C:\Users\ASUS>docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED         STATUS      PORTS      NAMES
7cdded83b44e   ubuntu    "bash"                  About a minute ago    Exited (0) 42 seconds ago           myubuntu
```

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## 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.

```
C:\Users\ASUS>docker start 7cdded83b44e
7cdded83b44e

C:\Users\ASUS>docker stop 7cdded83b44e
7cdded83b44e

C:\Users\ASUS>docker rm 7cdded83b44e
7cdded83b44e
```

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## Step 6: Remove Images

```
docker rmi ubuntu:latest
```

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

```
C:\Users\ASUS>docker rmi ubuntu:latest
Untagged: ubuntu:latest
Deleted: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
```

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