

Lab Exercise 1- Docker Fundamental Commands

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Batch-2(DevOps)

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
```

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

C:\Users\Misha>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: v2.40.2-desktop.1
      Path: C:\Program Files\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.)
```

Expected Output: Docker version and system details.

Step 2: Pull an Image from Docker Hub

```
docker pull ubuntu:latest
```

```
C:\Users\Misha>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
```

Explanation: Downloads the latest Ubuntu image from Docker Hub.

Check available images:

```
docker images
```

```
C:\Users\Misha>docker images
REPOSITORY          TAG      IMAGE ID      CREATED       SIZE
ubuntu              latest   cd1dba651b30  5 days ago   117MB
smartcampus-frontend    latest   584edc3d6c7f  7 weeks ago  85MB
misha1207/smartcampus-frontend    latest   584edc3d6c7f  7 weeks ago  85MB
<none>              <none>   177318997aef  7 weeks ago  84.9MB
smartcampus        latest   bc572bac8bbe  7 weeks ago  199MB
misha1207/smartcampus        latest   bc572bac8bbe  7 weeks ago  199MB
nginx-html-app      latest   f2185d94d89c  2 months ago  225MB
sonarqube           lts     f709975ab31d  4 months ago  1.02GB
hello-world         latest   f7931603f70e  5 months ago  20.3kB
```

Step 3: Run a Container

Run Ubuntu interactively:

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

```
C:\Users\Misha>docker run -it --name myubuntu ubuntu bash
root@93542becf8ad:/# |
```

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

Exit:

Exit

```
C:\Users\Misha>docker run -it --name myubuntu ubuntu bash
root@93542becf8ad:/# exit
exit

C:\Users\Misha>
```

Step 4: List Containers

- Show running containers:

```
docker ps
```

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

- Show all containers (including stopped):

```
docker ps -a
```

```
C:\Users\Misha>docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS
NAMES
93542becf8ad      ubuntu              "bash"              About a minute ago   Exited (0) About a minute ago
myubuntu
d780008ef8b3      177318997aef    "/docker-entrypoint...."  7 weeks ago       Exited (0) 7 weeks ago
youthful_gagarin
466a1f3515b4      177318997aef    "/docker-entrypoint...."  7 weeks ago       Created
great_williams
3a844f4e1cb3      smartcampus       "docker-entrypoint.s..."  7 weeks ago       Exited (255) 7 weeks ago      0.0.0.0:300
0->3000/tcp        youthful_lichterman
6ec9ca2fd92a      smartcampus       "docker-entrypoint.s..."  7 weeks ago       Created
quizzical_davinci
c4d7dc365d02      hello-world       "/hello"             2 months ago      Exited (0) 2 months ago
gifted_gates
3be0342fd4e2      sonarqube:lts   "/opt/sonarqube/dock..."  2 months ago      Exited (255) 8 weeks ago      0.0.0.0:900
0->9000/tcp        sonar
```

Step 5: Start / Stop / Remove Containers

```
# Start a stopped container
```

```
docker start <container_id>
```

```
C:\Users\Misha>docker start 93542becf8ad
93542becf8ad
```

```
# Stop a running container
```

```
docker stop <container_id>
```

```
C:\Users\Misha>docker stop 93542becf8ad  
93542becf8ad
```

Remove a container

```
docker rm <container_id>
```

```
C:\Users\Misha>docker rm c4d7dc365d02  
c4d7dc365d02
```

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

Step 6: Remove Images

```
docker rmi ubuntu:latest
```

```
C:\Users\Misha>docker rmi ubuntu:latest  
Error response from daemon: conflict: unable to delete ubuntu:latest (must be forced) - container 93542becf8ad is using  
its referenced image cd1dba651b30
```

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