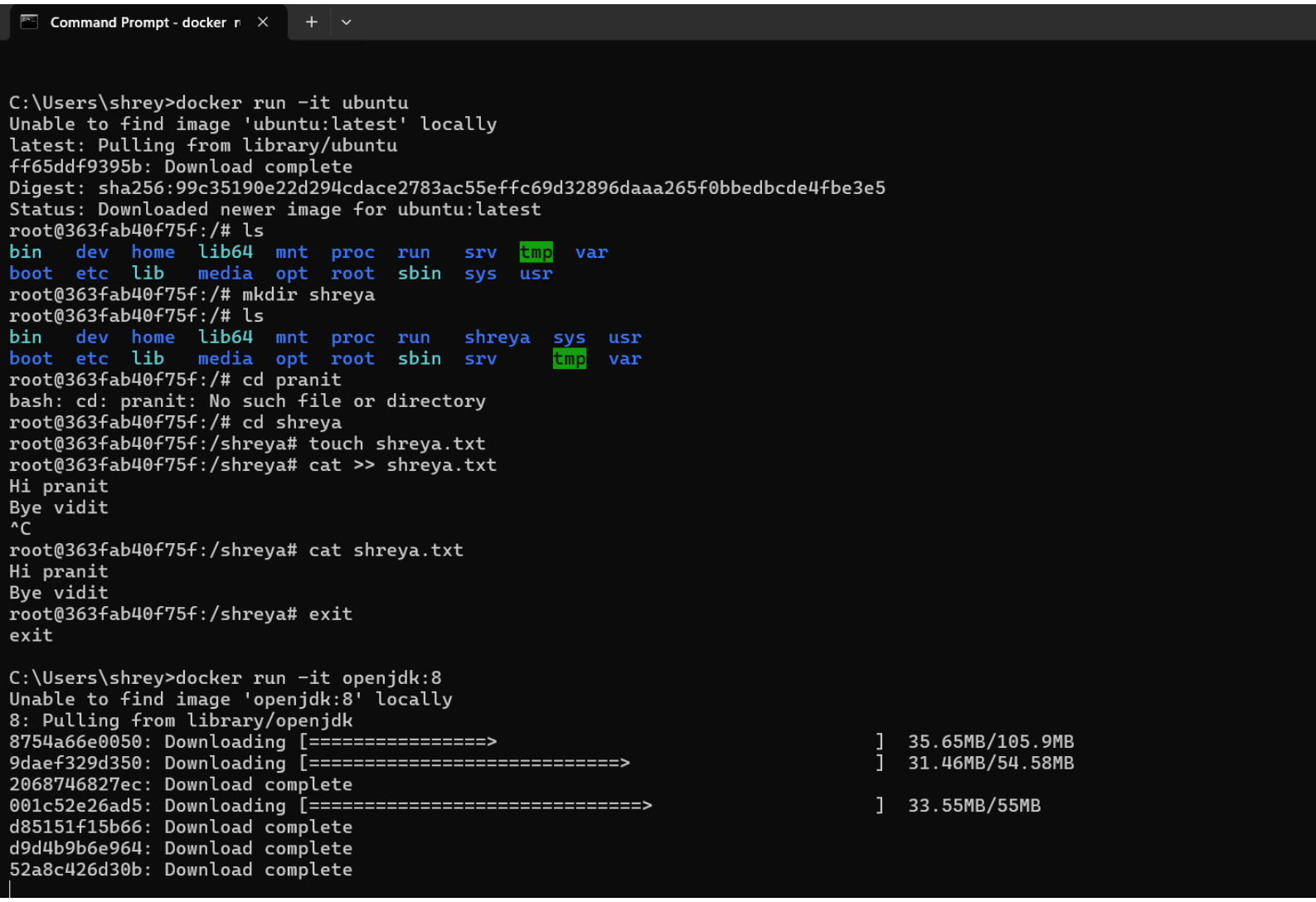
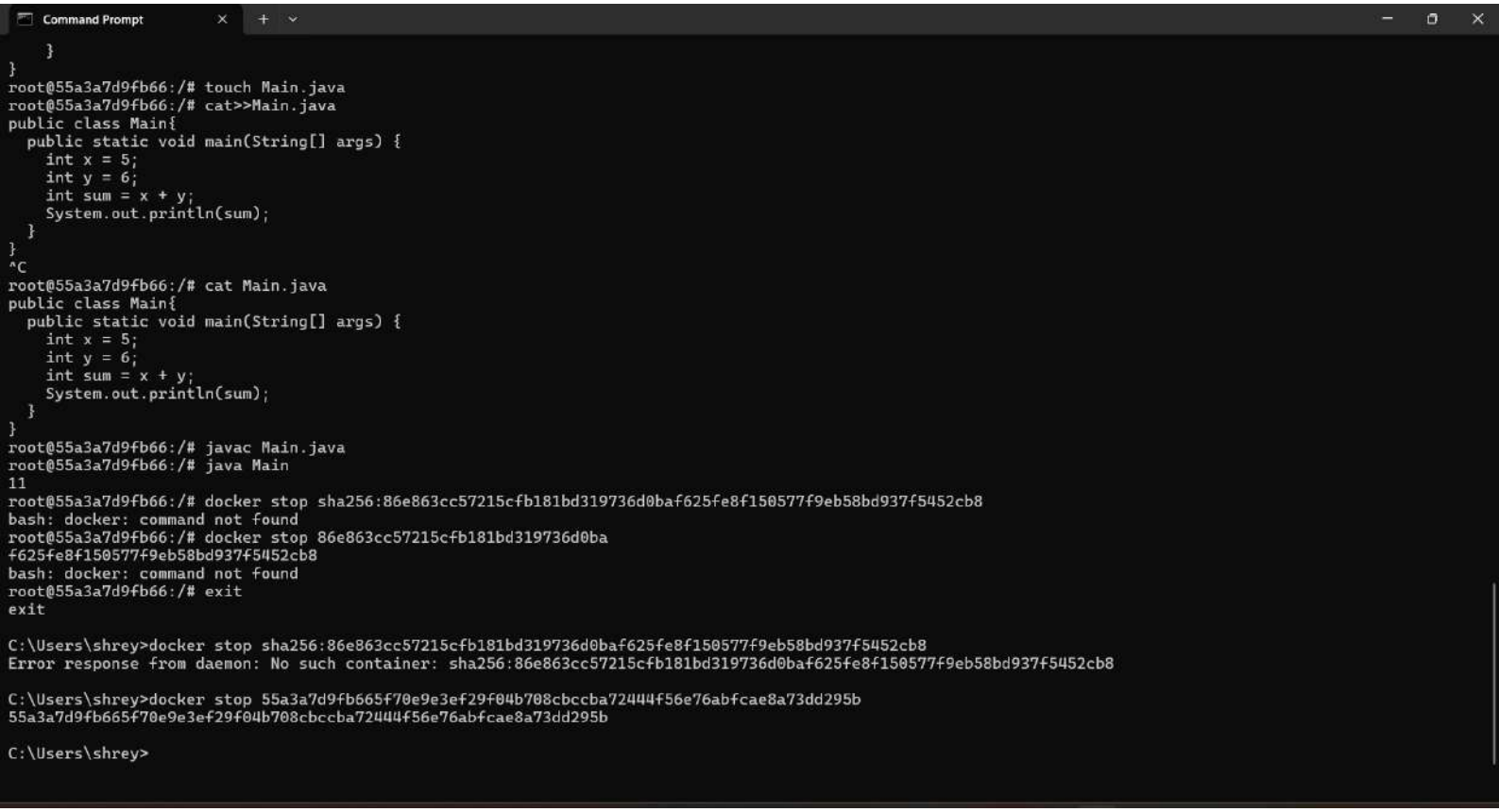
Command Prompt - docker r

```
Microsoft Windows [Version 10.0.22631.4317]
(c) Microsoft Corporation. All rights reserved.

C:\Users\shrey>docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
c1ec31eb5944: Download complete
Digest: sha256:d211f485f2dd1dee407a80973c8f129f00d54604d2c90732e8e320e5038a0348
Status: Downloaded newer image for hello-world:latest
docker.io/library/hello-world:latest

C:\Users\shrey>docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/


C:\Users\shrey>docker run -it ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
ff65ddf9395b: Download complete
Digest: sha256:99c35190e22d294cdace2783ac55effc69d32896daaa265f0bbedbcde4fbe3e5
Status: Downloaded newer image for ubuntu:latest
```


Command Prompt - docker r
C:\Users\shrey>docker run -it ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
ff65ddf9395b: Download complete
Digest: sha256:99c35190e22d294cdace2783ac55effc69d32896daaa265f0bbedbcde4fbe3e5
Status: Downloaded newer image for ubuntu:latest
root@363fab40f75f:/# ls
bin dev home lib64 mnt proc run srv tmp var
boot etc lib media opt root sbin sys usr
root@363fab40f75f:/# mkdir shreya
root@363fab40f75f:/# ls
bin dev home lib64 mnt proc run shreya sys usr
boot etc lib media opt root sbin srv tmp var
root@363fab40f75f:/# cd pranit
bash: cd: pranit: No such file or directory
root@363fab40f75f:/# cd shreya
root@363fab40f75f:/shreya# touch shreya.txt
root@363fab40f75f:/shreya# cat >> shreya.txt
Hi pranit
Bye vidit
^C
root@363fab40f75f:/shreya# cat shreya.txt
Hi pranit
Bye vidit
root@363fab40f75f:/shreya# exit
exit
C:\Users\shrey>docker run -it openjdk:8
Unable to find image 'openjdk:8' locally
8: Pulling from library/openjdk
8754a66e0050: Downloading [=================>] 35.65MB/105.9MB
9daef329d350: Downloading [============================>] 31.46MB/54.58MB
2068746827ec: Download complete
001c52e26ad5: Downloading [==============================>] 33.55MB/55MB
d85151f15b66: Download complete
d9d4b9b6e964: Download complete
52a8c426d30b: Download complete


Command Prompt
}
}
root@55a3a7d9fb66:/# touch Main.java
root@55a3a7d9fb66:/# cat>>Main.java
public class Main{
public static void main(String[] args) {
int x = 5;
int y = 6;
int sum = x + y;
System.out.println(sum);
}
}
^C
root@55a3a7d9fb66:/# cat Main.java
public class Main{
public static void main(String[] args) {
int x = 5;
int y = 6;
int sum = x + y;
System.out.println(sum);
}
}
root@55a3a7d9fb66:/# javac Main.java
root@55a3a7d9fb66:/# java Main
11
root@55a3a7d9fb66:/# docker stop sha256:86e863cc57215cfb181bd319736d0baf625fe8f150577f9eb58bd937f5452cb8
bash: docker: command not found
root@55a3a7d9fb66:/# docker stop 86e863cc57215cfb181bd319736d0ba
f625fe8f150577f9eb58bd937f5452cb8
bash: docker: command not found
root@55a3a7d9fb66:/# exit
exit
C:\Users\shrey>docker stop sha256:86e863cc57215cfb181bd319736d0baf625fe8f150577f9eb58bd937f5452cb8
Error response from daemon: No such container: sha256:86e863cc57215cfb181bd319736d0baf625fe8f150577f9eb58bd937f5452cb8
C:\Users\shrey>docker stop 55a3a7d9fb665f70e9e3ef29f04b708cbccba72444f56e76abfcae8a73dd295b
55a3a7d9fb665f70e9e3ef29f04b708cbccba72444f56e76abfcae8a73dd295b
C:\Users\shrey>

Command Prompt

```
root@55a3a7d9fb66:/# exit
exit

C:\Users\shrey>docker stop sha256:86e863cc57215cfb181bd319736d0baf625fe8f150577f9eb58bd937f5452cb8
Error response from daemon: No such container: sha256:86e863cc57215cfb181bd319736d0baf625fe8f150577f9eb58bd937f5452cb8

C:\Users\shrey>docker stop 55a3a7d9fb665f70e9e3ef29f04b708cbccba72444f56e76abfcae8a73dd295b
55a3a7d9fb665f70e9e3ef29f04b708cbccba72444f56e76abfcae8a73dd295b

C:\Users\shrey>docker start fervent_keller
fervent_keller

C:\Users\shrey>docker stop 55a3a7d9fb665f70e9e3ef29f04b708cbccba72444f56e76abfcae8a73dd295b
55a3a7d9fb665f70e9e3ef29f04b708cbccba72444f56e76abfcae8a73dd295b

C:\Users\shrey>docker run -it python:3.9.19-bullseye
Unable to find image 'python:3.9.19-bullseye' locally
3.9.19-bullseye: Pulling from library/python
54cfd30604e6: Download complete
ba83bbfca944: Download complete
6d691dff6d17: Download complete
9b36d483c6c2: Download complete
303a1cf41ce1: Download complete
48e779000ed2: Download complete
ee26ff40ab0c: Download complete
1e1a6321ee78: Download complete
Digest: sha256:5f263dd7b57313903fe9494e9a01bbb9148eabc8e6a826c6b2b1f5fe279d87bb
Status: Downloaded newer image for python:3.9.19-bullseye
Python 3.9.19 (main, Sep  5 2024, 00:26:10)
[GCC 10.2.1 20210110] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Aditya is mad")
Aditya is mad
>>> exit()

C:\Users\shrey>
```

```
C:\Users\LAB503>docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

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 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```
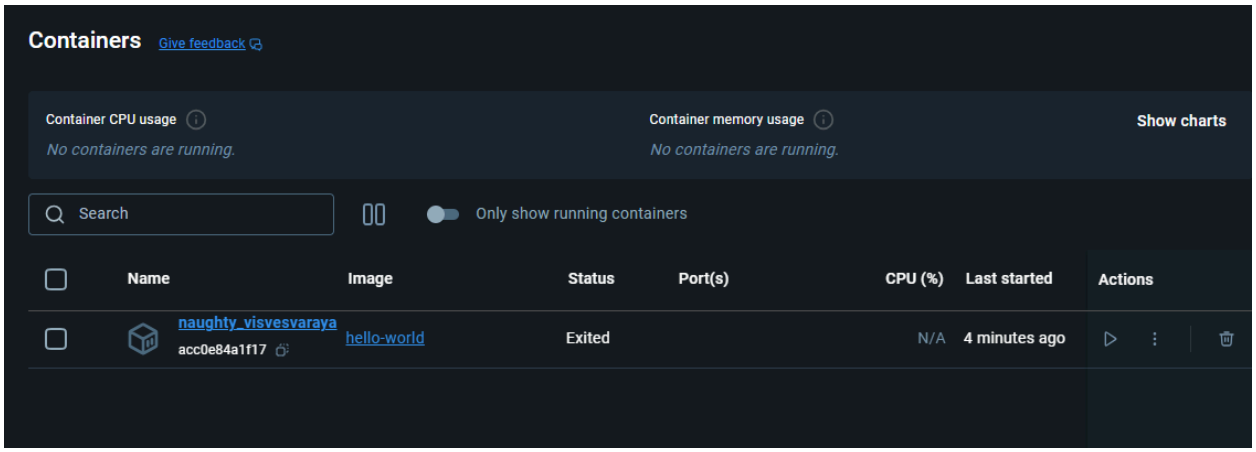
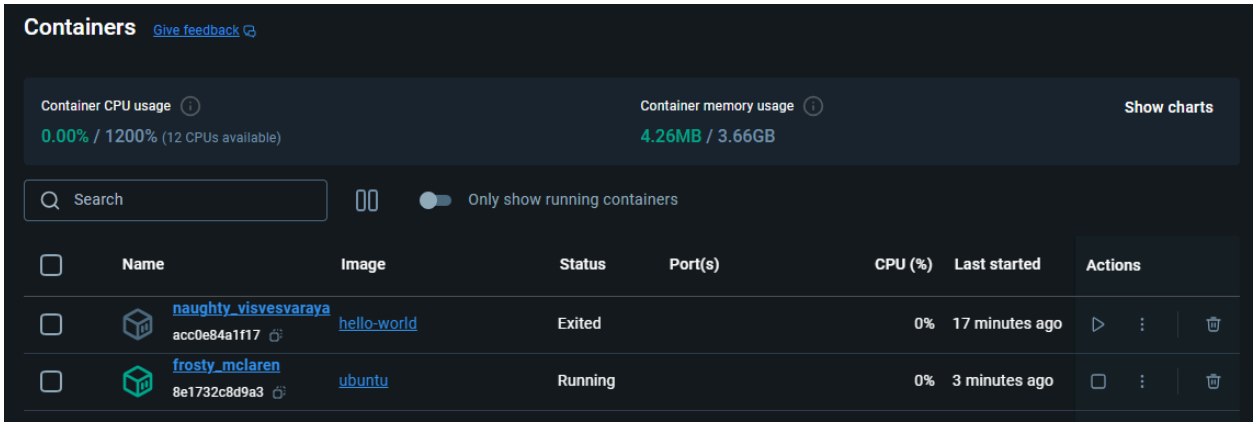
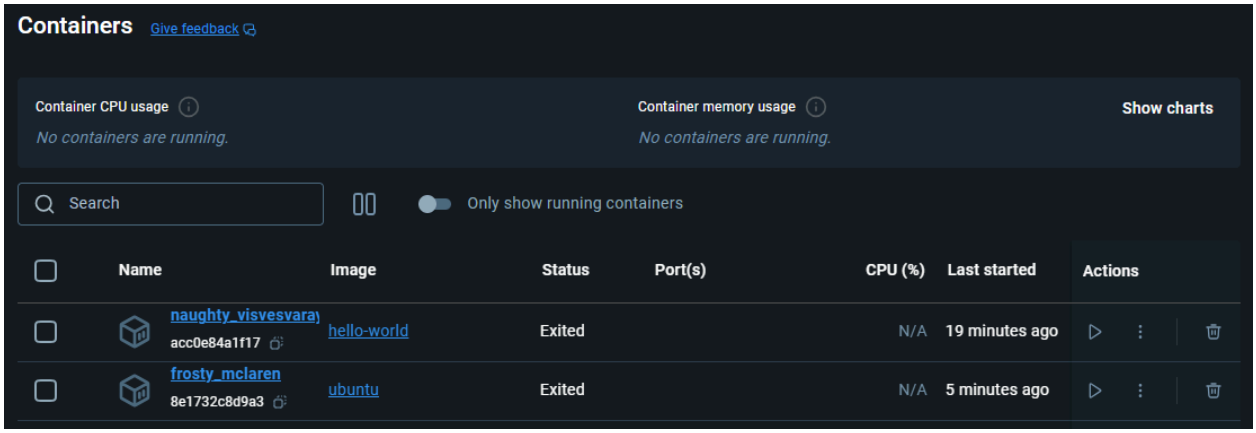




```
C:\Users\LAB503>docker run -it ubuntu
root@8e1732c8d9a3:/# ls
bin   dev  home  lib64  mnt  proc  run   srv  tmp  var
boot  etc  lib   media  opt  root  sbin  sys  usr
root@8e1732c8d9a3:/# touch vanshita
root@8e1732c8d9a3:/# ls
bin   dev  home  lib64  mnt  proc  run   srv  tmp  vanshita
boot  etc  lib   media  opt  root  sbin  sys  usr  var
root@8e1732c8d9a3:/#
```

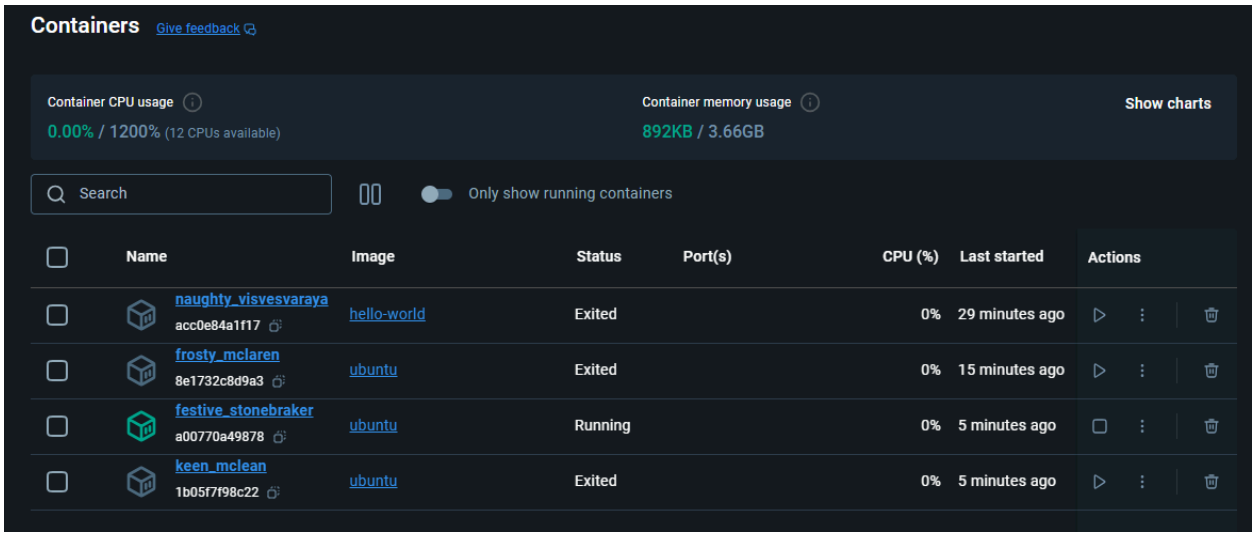



```
root@8e1732c8d9a3:/# exit
exit
```

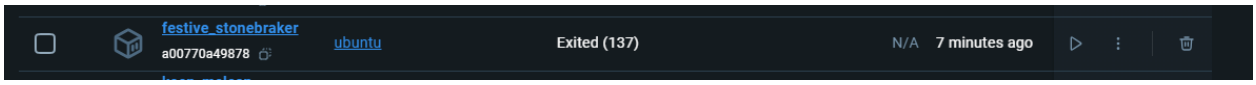



```
Command Prompt

C:\Users\LAB503>docker run -it ubuntu
root@1b05f7f98c22:/# ls
bin   dev  home  lib64  mnt  proc  run   srv  tmp  var
boot  etc  lib   media  opt  root  sbin  sys  usr
root@1b05f7f98c22:/# touch vanshita
root@1b05f7f98c22:/# ls
bin   dev  home  lib64  mnt  proc  run   srv  tmp  vanshita
boot  etc  lib   media  opt  root  sbin  sys  usr  var
root@1b05f7f98c22:/# exit
exit

C:\Users\LAB503>
```

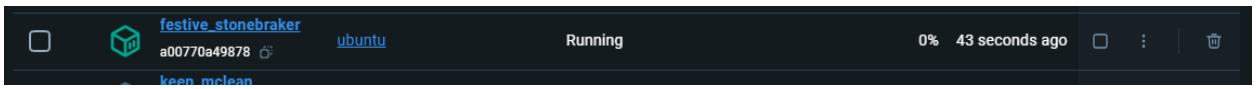
```
root@a00770a49878: /
Microsoft Windows [Version 10.0.22631.3958]
(c) Microsoft Corporation. All rights reserved.

C:\Users\LAB503>docker run -it ubuntu
root@a00770a49878:/#
```




```
C:\Users\LAB503>docker stop festive_stonebraker
festive_stonebraker

C:\Users\LAB503>
```



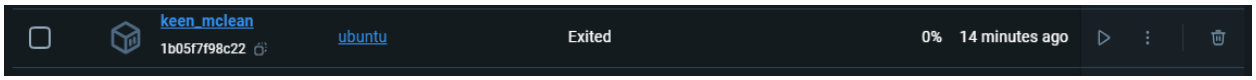

```
C:\Users\LAB503>docker start festive_stonebraker
festive_stonebraker
```




```
C:\Users\LAB503>docker container ls
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS              PORTS     NAMES
a00770a49878   ubuntu    "/bin/bash"   10 minutes ago   Up About a minute             festive_stonebraker
```

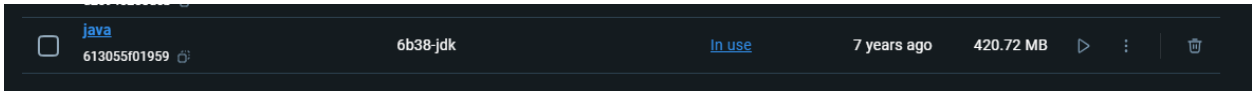
Command Prompt

```
C:\Users\LAB503>docker container ls -a
CONTAINER ID   IMAGE         COMMAND       CREATED          STATUS                      PORTS     NAMES
1b05f7f98c22   ubuntu        "/bin/bash"   10 minutes ago   Exited (0) 7 minutes ago              keen_mclean
a00770a49878   ubuntu        "/bin/bash"   10 minutes ago   Up 2 minutes                          festive_stone
braker
8e1732c8d9a3   ubuntu        "/bin/bash"   20 minutes ago   Exited (0) 15 minutes ago             frosty_mclare
n
acc0e84a1f17   hello-world   "/hello"      34 minutes ago   Exited (0) 34 minutes ago             naughty_visve
svaraya
```



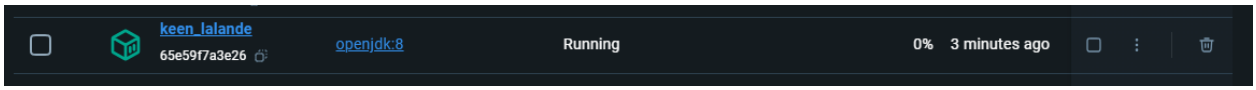

```
C:\Users\LAB503>docker start keen_mclean
keen_mclean

C:\Users\LAB503>docker exec -it keen_mclean ls
bin   dev  home  lib64  mnt  proc  run   srv  tmp  vanshita
boot  etc  lib   media  opt  root  sbin  sys  usr  var

What's next:
    Try Docker Debug for seamless, persistent debugging tools in any container or image → docker debug keen_mcl
ean
    Learn more at https://docs.docker.com/go/debug-cli/

C:\Users\LAB503>
```

```
C:\Users\LAB503>docker images
REPOSITORY    TAG       IMAGE ID       CREATED          SIZE
ubuntu        latest    35a88802559d   2 months ago     78.1MB
hello-world   latest    d2c94e258dcb   16 months ago    13.3kB
```



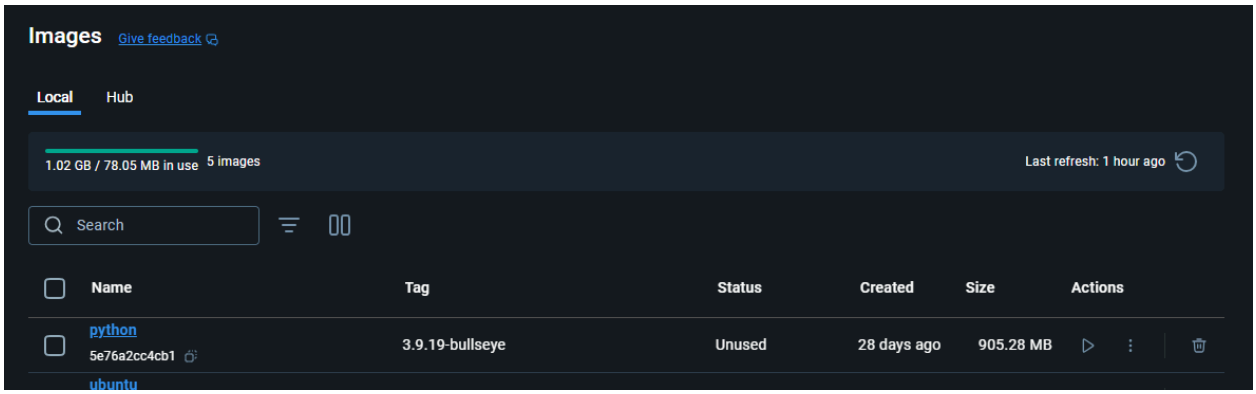

```
C:\Users\LAB503>docker run -it java:6b38-jdk

C:\Users\LAB503>
```

```
C:\Users\LAB503>docker run -it openjdk:8
Unable to find image 'openjdk:8' locally
8: Pulling from library/openjdk
001c52e26ad5: Pull complete
d9d4b9b6e964: Pull complete
2068746827ec: Pull complete
9daef329d350: Pull complete
d85151f15b66: Pull complete
52a8c426d30b: Pull complete
8754a66e0050: Pull complete
Digest: sha256:86e863cc57215cfb181bd319736d0baf625fe8f150577f9eb58bd937f5452cb8
Status: Downloaded newer image for openjdk:8
root@65e59f7a3e26:/#
```




```
root@65e59f7a3e26:/# touch helloworld.java
root@65e59f7a3e26:/# ls
bin   dev  helloworld.java  lib    media  opt   root  sbin  sys  usr
boot  etc  home             lib64  mnt    proc  run   srv   tmp  var
root@65e59f7a3e26:/# cat >>helloworld.java
class helloworld{
public static void main(String args []){
System.out.println("Hello World!)
}
}^C
```

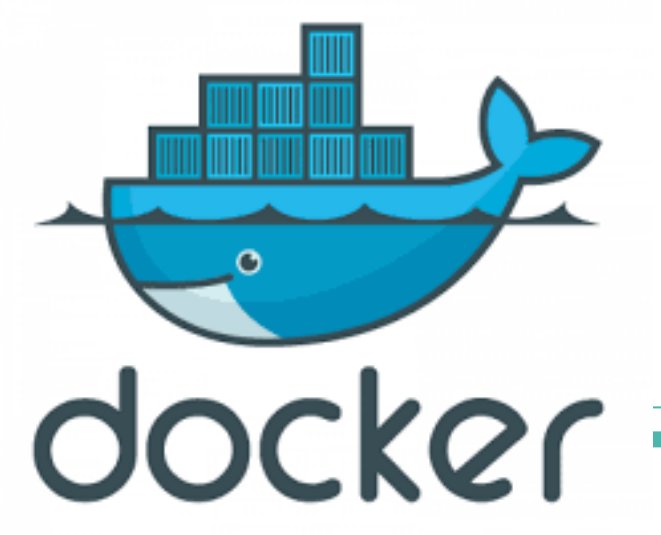
```
root@65e59f7a3e26:/# javac helloworld.java
root@65e59f7a3e26:/# java helloworld
Hello World!
root@65e59f7a3e26:/# exit
exit
```




```
C:\Users\LAB503>docker run -it python:3.9.19-bullseye
Python 3.9.19 (main, Aug 13 2024, 02:07:28)
[GCC 10.2.1 20210110] on linux
Type "help", "copyright", "credits" or "license" for more information.
```

```
>>> print("Hello World!")
Hello World!
>>>
```

Docker and Containerization



About DOCKER

What is Docker?

- Docker is an open-source platform that automates the deployment of applications inside lightweight, portable containers.
- Developed in 2013 by Docker, Inc.

What is Containerization?

- A method of packaging an application and its dependencies into a single container.
- Containers are lightweight, consistent, and isolated.

Why Containerization?

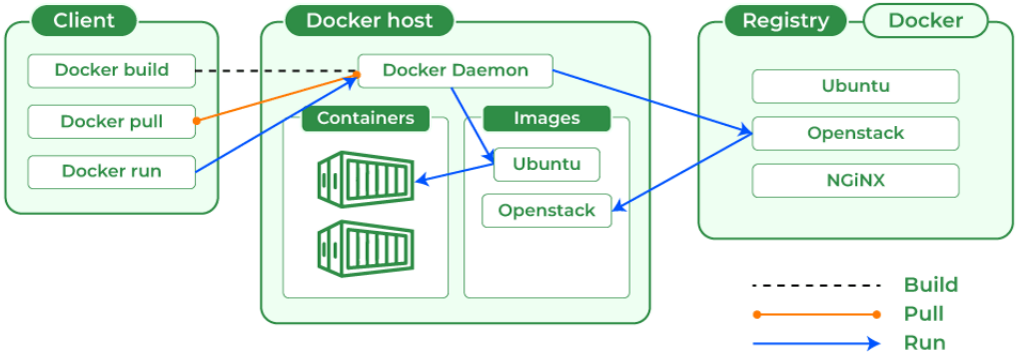
Challenges with Traditional Deployment:

- Dependency issues.
- Environment inconsistencies.
- Resource inefficiency.

Benefits of Containerization:

- **Portability:** Containers run the same, regardless of where they're deployed.
- **Isolation:** Each container is isolated from others, ensuring that apps don't interfere with each other.
- **Efficiency:** Containers share the host system's kernel, making them lighter and faster than traditional virtual machines.

Docker Architecture



Docker Engine:

The core component of Docker, consisting of:

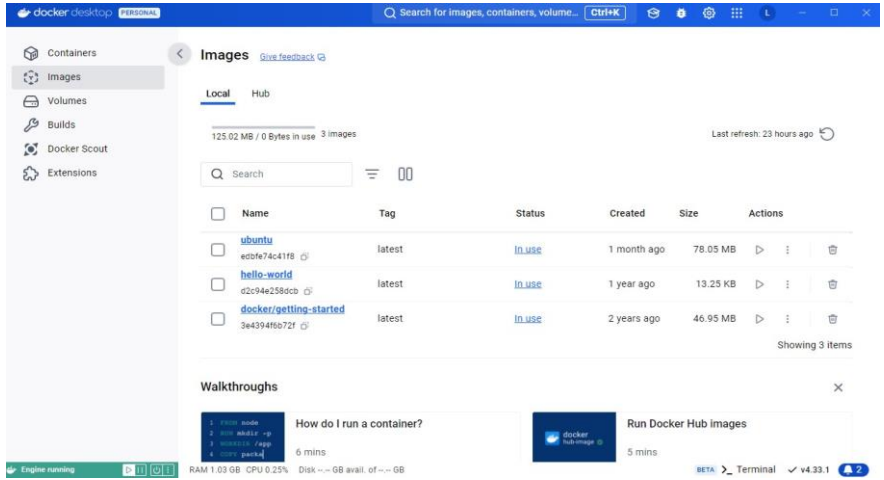
- **Docker Daemon:** Manages Docker objects like containers, images, and networks.
- **Docker CLI:** Command-line interface for interacting with the Docker Daemon.
- **Docker Images:** Read-only templates used to create containers.

Container vs. Virtual Machine:

Containers share the host OS kernel, while VMs include a full OS, making containers much more lightweight.

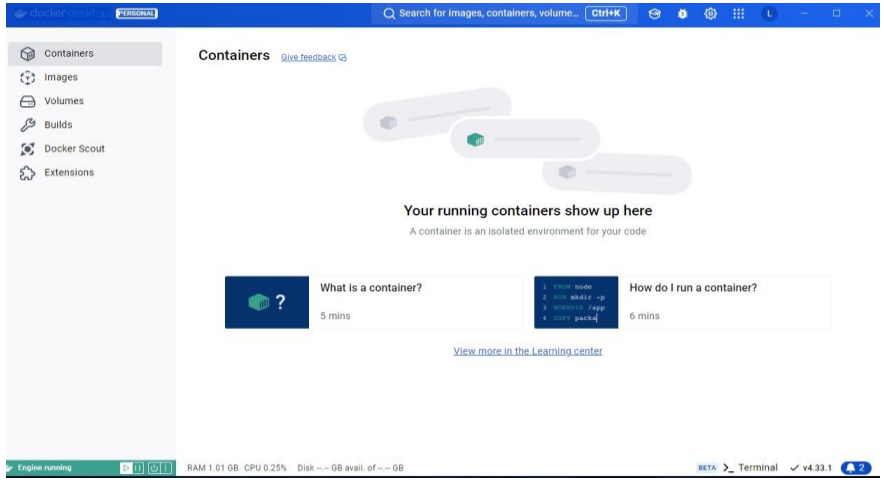
DOCKER Images

A file that contains the instructions for creating a Docker container



DOCKER Containers

A software package that includes all the necessary components to run an application, and can run on many different operating systems and devices



DOCKER Commands

```
C:\Users\Siddesh>docker -v
Docker version 27.1.1, build 6312585
```

To check DOCKER Version

```
C:\Users\Siddesh>docker images
REPOSITORY    TAG       IMAGE ID       CREATED          SIZE
ubuntu        latest    edbfe74c41f8   4 weeks ago      78.1MB
hello-world   latest    d2c94e258dcb   16 months ago    13.3kB
```

DOCKER images

```
C:\Users\Siddesh>docker container ls -a
CONTAINER ID   IMAGE                     COMMAND                  CREATED              STATUS                          PORTS                  NAMES
ef9791705606   ubuntu                    "/bin/bash"              About a minute ago   Exited (0) 11 seconds ago                              sharp_ellis
d7f527d874a4   docker/getting-started    "/docker-entrypoint.…"   20 minutes ago       Up 20 minutes                   0.0.0.0:80->80/tcp     elegant_newton
71edd6e8e02a   hello-world               "/hello"                 34 minutes ago       Exited (0) 34 minutes ago                              serene_greider
```

DOCKER container ls -a

```
C:\Users\Siddesh>docker container ls
CONTAINER ID   IMAGE                    COMMAND                  CREATED
     STATUS          PORTS               NAMES
d7f527d874a4   docker/getting-started   "/docker-entrypoint.…"   18 minutes a
go   Up 18 minutes   0.0.0.0:80->80/tcp   elegant_newton

C:\Users\Siddesh>docker container ls
CONTAINER ID   IMAGE                    COMMAND                  CREATED
     STATUS          PORTS               NAMES
ef9791705606   ubuntu                   "/bin/bash"              4 seconds ag
o    Up 4 seconds                       sharp_ellis
d7f527d874a4   docker/getting-started   "/docker-entrypoint.…"   18 minutes a
go   Up 18 minutes   0.0.0.0:80->80/tcp   elegant_newton
```

```
C:\Users\Siddesh>docker run -it ubuntu
root@ef9791705606:/#
```

container ls


```
C:\Users\Siddesh>docker container ls
CONTAINER ID   IMAGE                    COMMAND                  CREATED
     STATUS          PORTS               NAMES
d7f527d874a4   docker/getting-started   "/docker-entrypoint.…"   18 minutes a
go   Up 18 minutes   0.0.0.0:80->80/tcp   elegant_newton

C:\Users\Siddesh>docker container ls
CONTAINER ID   IMAGE                    COMMAND                  CREATED
     STATUS          PORTS               NAMES
ef9791705606   ubuntu                   "/bin/bash"              4 seconds ag
o    Up 4 seconds                       sharp_ellis
d7f527d874a4   docker/getting-started   "/docker-entrypoint.…"   18 minutes a
go   Up 18 minutes   0.0.0.0:80->80/tcp   elegant_newton
```

```
C:\Users\Siddesh>docker run -it ubuntu
root@ef9791705606:/#
```


To start and stop container

```
C:\Users\Siddesh>docker run -it ubuntu bash
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
31e907dcc94a: Pull complete
Digest: sha256:8a37d68f4f73ebf3d4efafbcf66379bf3728902a8038616808f04e34a9ab63ee
Status: Downloaded newer image for ubuntu:latest
root@e23ea2dec4aa:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@e23ea2dec4aa:/# cd home
root@e23ea2dec4aa:/home# ls
ubuntu
root@e23ea2dec4aa:/home# ^C
root@e23ea2dec4aa:/home# exit
exit

C:\Users\Siddesh>
```

Run ubuntu bash command

```
C:\Users\Siddesh>docker exec sharp_ellis ls
bin
boot
dev
etc
home
lib
lib64
media
mnt
opt
proc
root
run
sbin
srv
sys
tmp
usr
var
```

Exec sharp_ellis ls command

```
C:\Users\Siddesh>docker run -d -p 80:80 docker/getting-started
Unable to find image 'docker/getting-started:latest' locally
latest: Pulling from docker/getting-started
c158987b0551: Pull complete
1e35f6679fab: Pull complete
cb9626c74200: Pull complete
b6334b6ace34: Pull complete
f1d1c9928c82: Pull complete
9b6f639ec6ea: Pull complete
ee68d3549ec8: Pull complete
33e0cbbb4673: Pull complete
4f7e34c2de10: Pull complete
Digest: sha256:d79336f4812b6547a53e735480dde67f8f8f7071b414fbd9297609ffb989abc1
Status: Downloaded newer image for docker/getting-started:latest
d7f527d874a45efa649af4a47f537dd3900518a3acf8e4f4c307fbf7b6001f38
```

DOCKER getting started command

```
C:\Users\Siddesh>docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:53cc4d415d839c98be39331c948609b659ed725170ad2ca8eb36951288f81b75
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```

‘Hello world’ using DOCKER

```
C:\Users\Siddesh>docker run -it python
Python 3.12.5 (main, Aug 13 2024, 02:19:05) [GCC 12.2.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> print(hello world)
  File "<stdin>", line 1
    print(hello world)
          ^^^^^^^^^^^
SyntaxError: invalid syntax. Perhaps you forgot a comma?
>>> print("hello world")
hello world
```

Execute python program

Advantages of Docker

Consistency Across Environments: "It works on my machine" problem is eliminated.

Resource Efficiency: Less overhead compared to VMs.

Scalability: Easily scale applications horizontally.

Challenges with Docker

Security Concerns: Containers share the host OS, which can lead to potential security vulnerabilities.

Complexity: Managing large numbers of containers can be challenging.

Persistent Storage: Managing data persistence requires additional tools and strategies.

Conclusion

- Docker is transforming how applications are deployed and managed.
- It offers a powerful solution for modern, cloud-native applications, enabling consistency, efficiency, and scalability.