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Class :- D20B

Roll No:- 57

Experiment no :- 10

Aim: To Study and implement containerization using DOCKER.

Theory :-

Containerization is a technique used to package an application and its dependencies together, ensuring that it runs seamlessly in any environment. Docker is a popular tool for containerization. Here's a brief overview of the key concepts:

1. Containers: Containers are lightweight, standalone, executable packages of software that include everything needed to run a piece of software, including the code, runtime, libraries, and dependencies.

2. Images: Images are read-only templates that contain the application and its dependencies. They are used to create containers.

3. Dockerfile: A Dockerfile is a text file that contains instructions for building a Docker image. It specifies the base image, dependencies to install, and commands to run.

4. Docker Hub: Docker Hub is a cloud-based registry service that allows you to store and share Docker images.

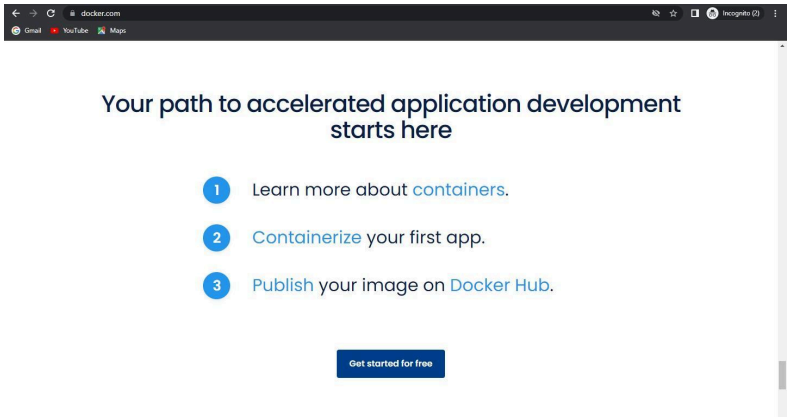
5. Docker Compose: Docker Compose is a tool used to define and run multi-container Docker applications. It uses a YAML file to configure the application's services.

6. Docker Swarm: Docker Swarm is a clustering and scheduling tool for Docker containers. It allows you to create and manage a cluster of Docker nodes.

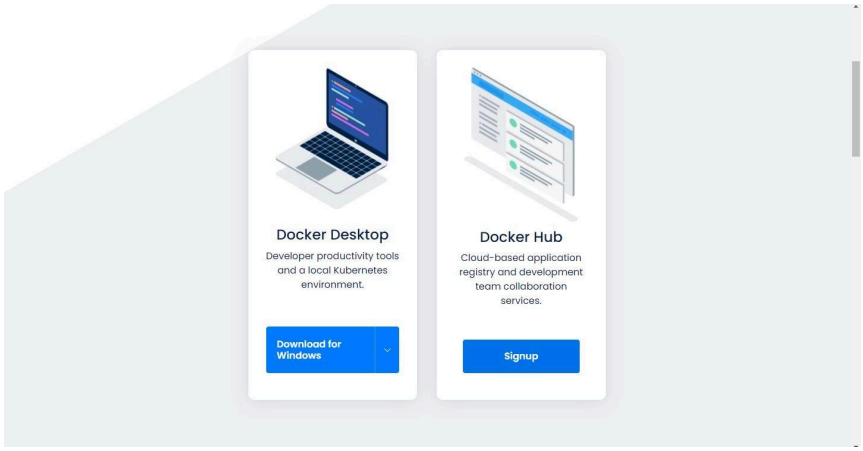
To start learning Docker, you can begin by installing Docker on your machine and exploring its documentation and tutorials. Practice building and running containers, creating Dockerfiles, and using Docker Compose to manage multi-container applications.

Steps :

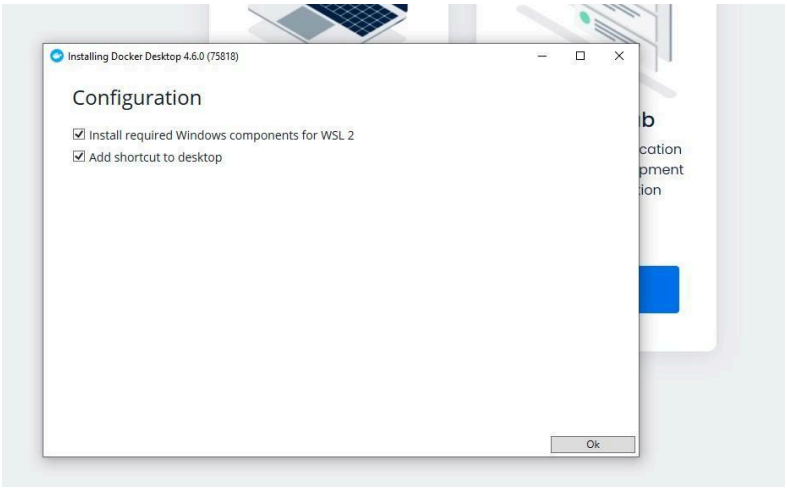
Step 01: Open docker.com Scroll down, Click on ‘Get started for free’ tab.



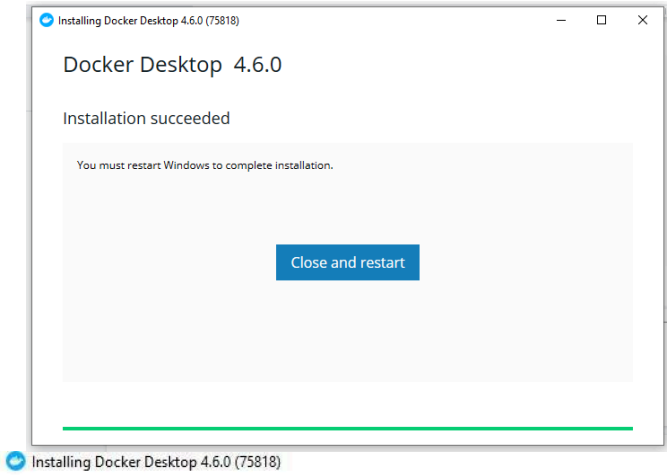
Step 02: Click on Docker Desktop, Download it.

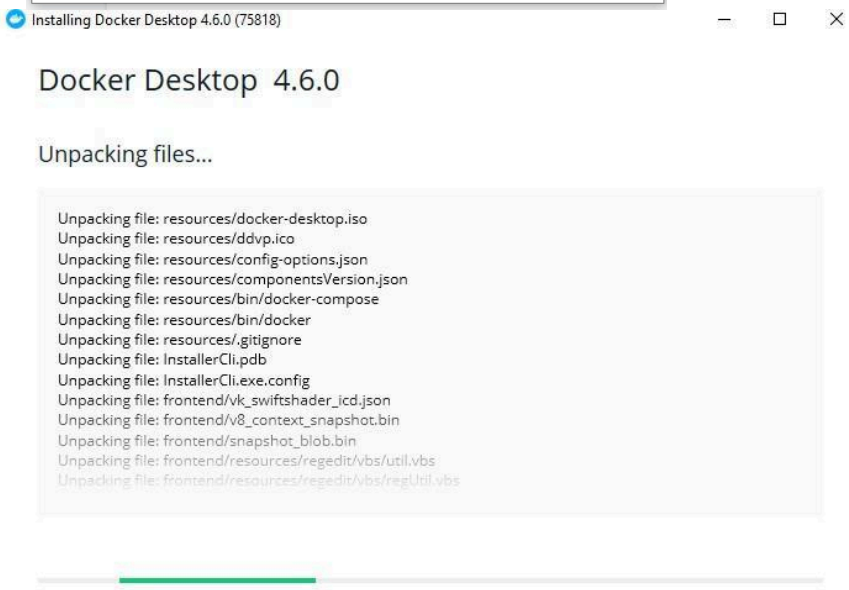


Step 03: After downloading, Open ‘Docker Desktop Installer’ & start installation.

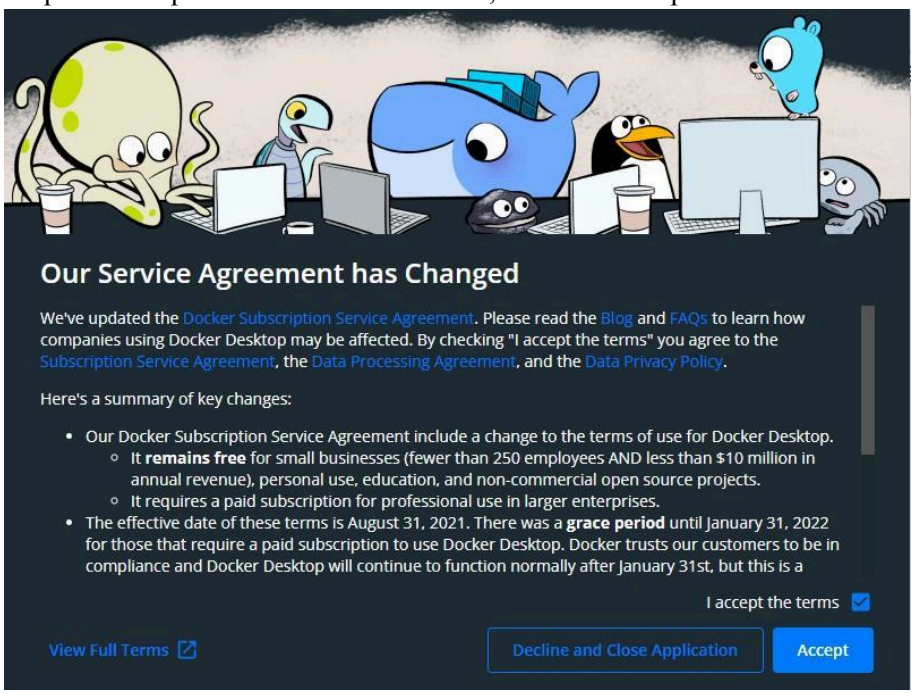


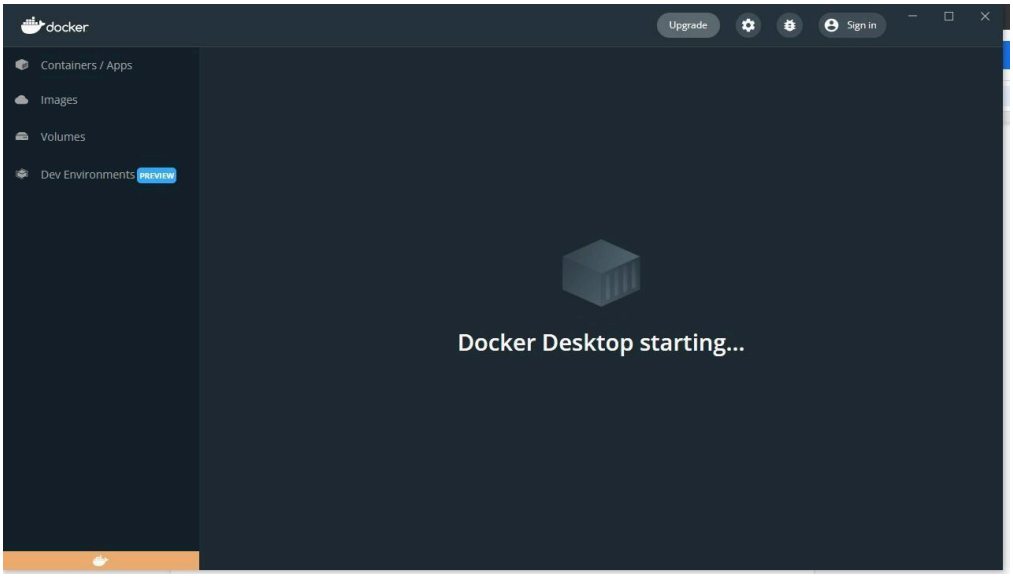
Step 04: After Installation, Restart your device.





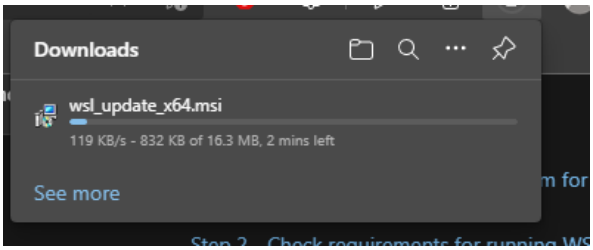
Step 05: Accept the terms and conditions, Click on Accept.

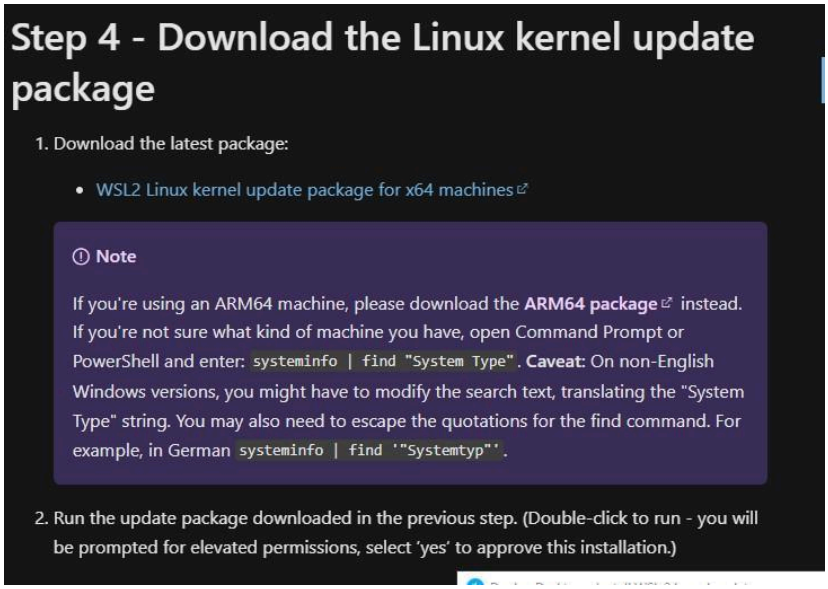




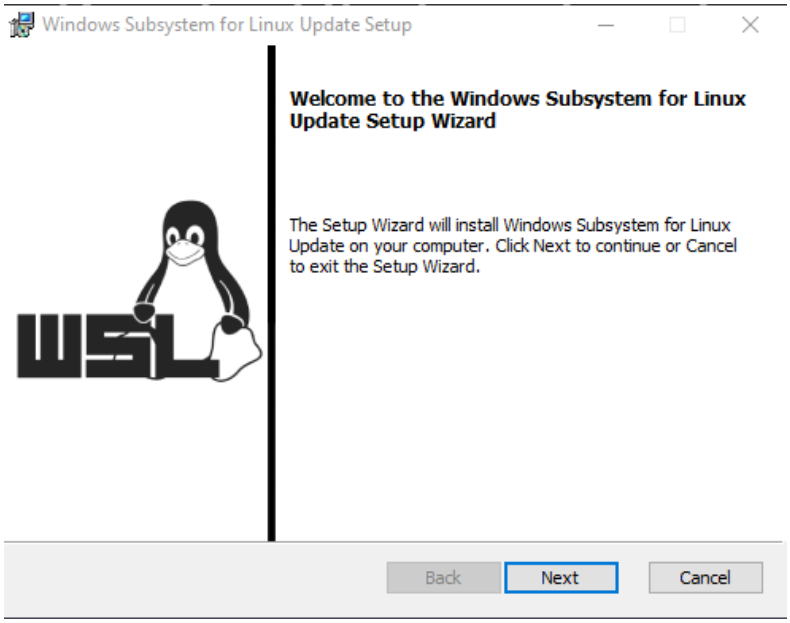
step 06 :- The following window should pop up.Click on the link https://aka.ms/wsl2kernel.do not close this window.

Download the WSL2 Linux kernel update package for x64 machines.

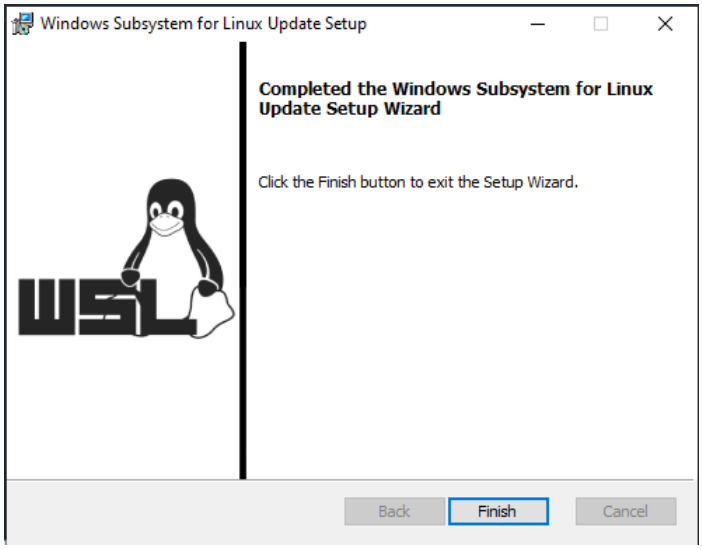




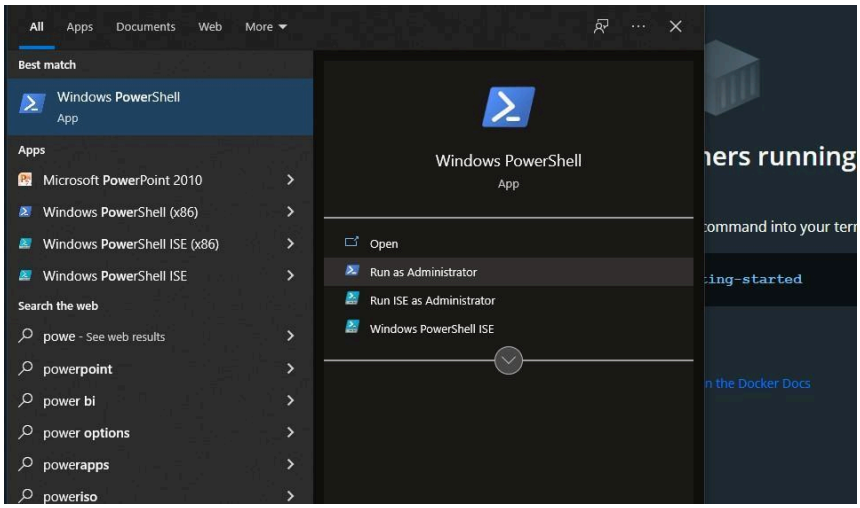
After Download is complete, Run the *.msi* package. Click on next.



After, the setup is complete, Click on finish.



Open Powershell as an Administrator.



Run the following Command:

wsl --set-default-version 2

```
PS C:\WINDOWS\system32> wsl --set-default-version 2
For information on key differences with WSL 2 please visit https://aka.ms/wsl2
The operation completed successfully.
PS C:\WINDOWS\system32>
```

Now, Click on Restart

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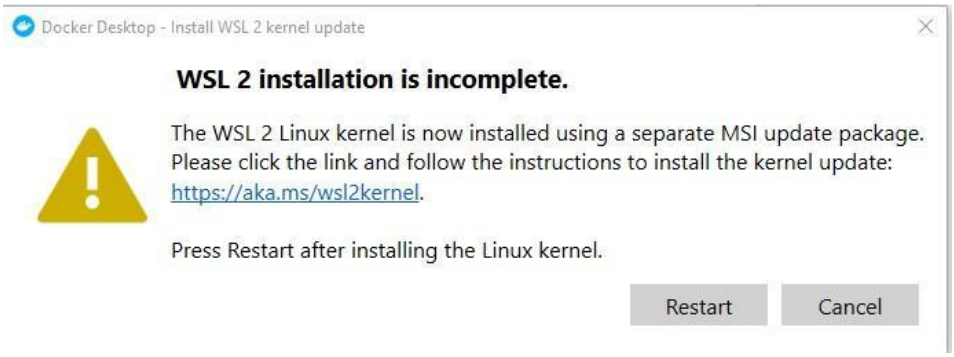
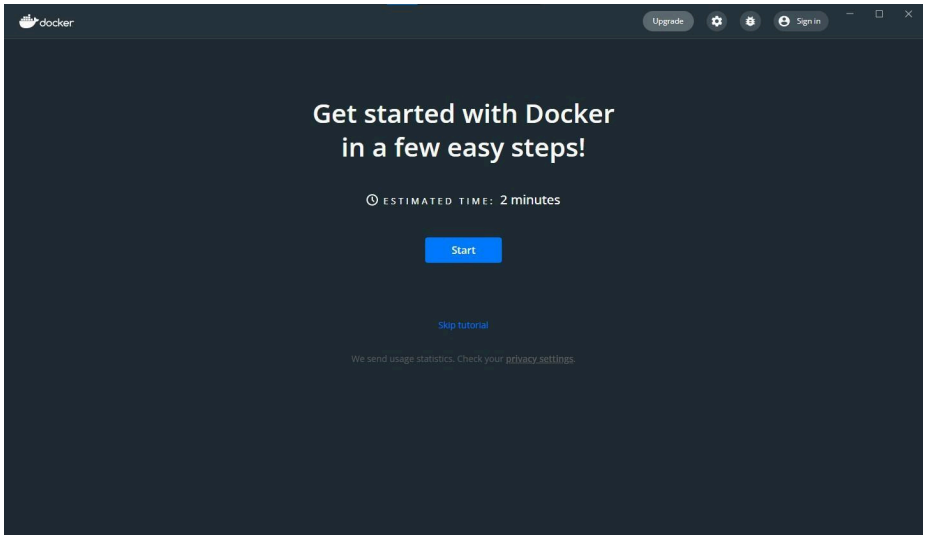
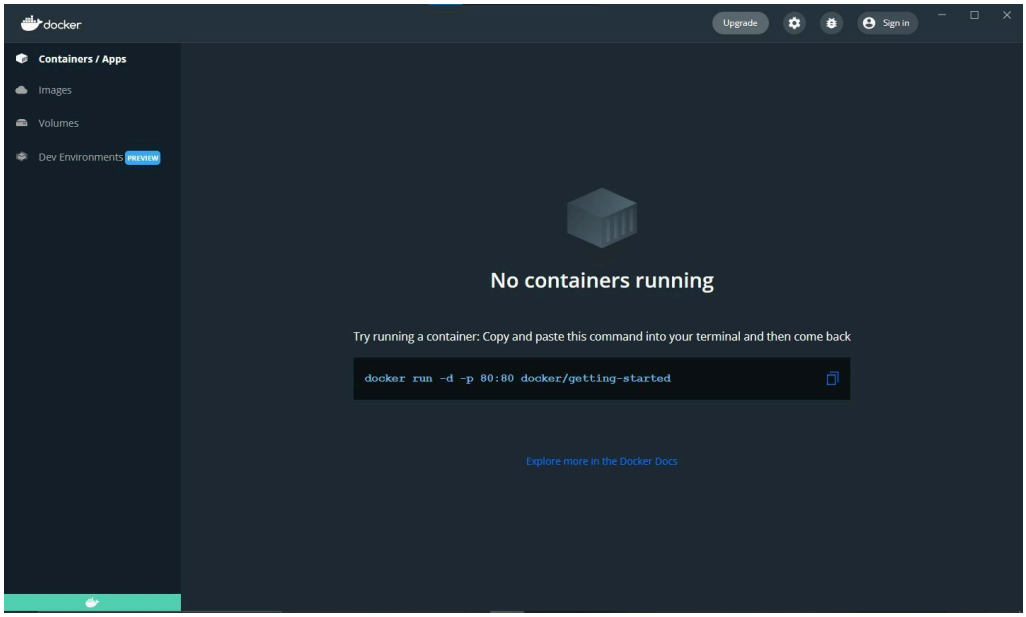


Docker should now restart. Click on Start.



The following window should pop up. This means, Installation is now complete.



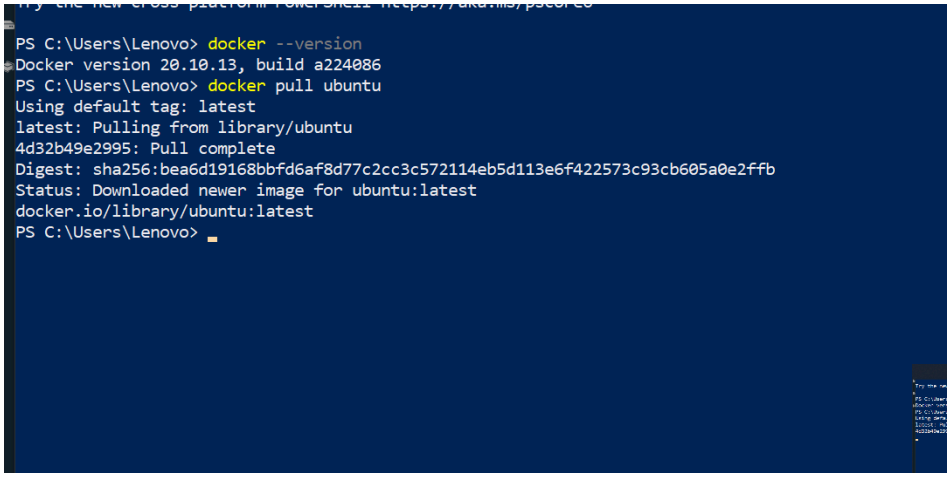
Open Command Prompt, run the following commands:

1) To check the version of Docker:

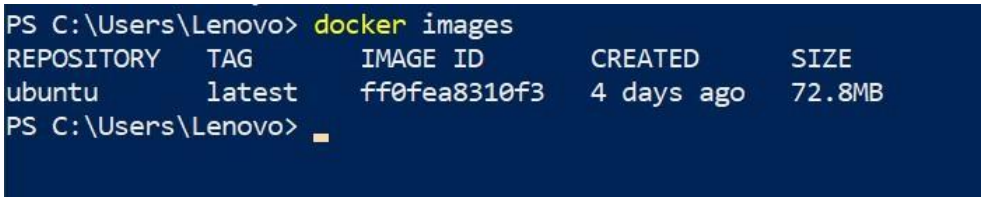
docker --version

2) To install image of ubuntu

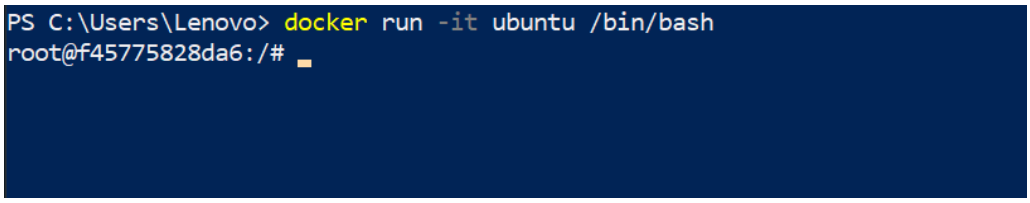
docker pull ubuntu



3) Check downloaded images,docker images



4) Run ubuntu OS *docker run -it ubuntu /bin/bash*



5) Open another Command Prompt and follow the steps shown below.

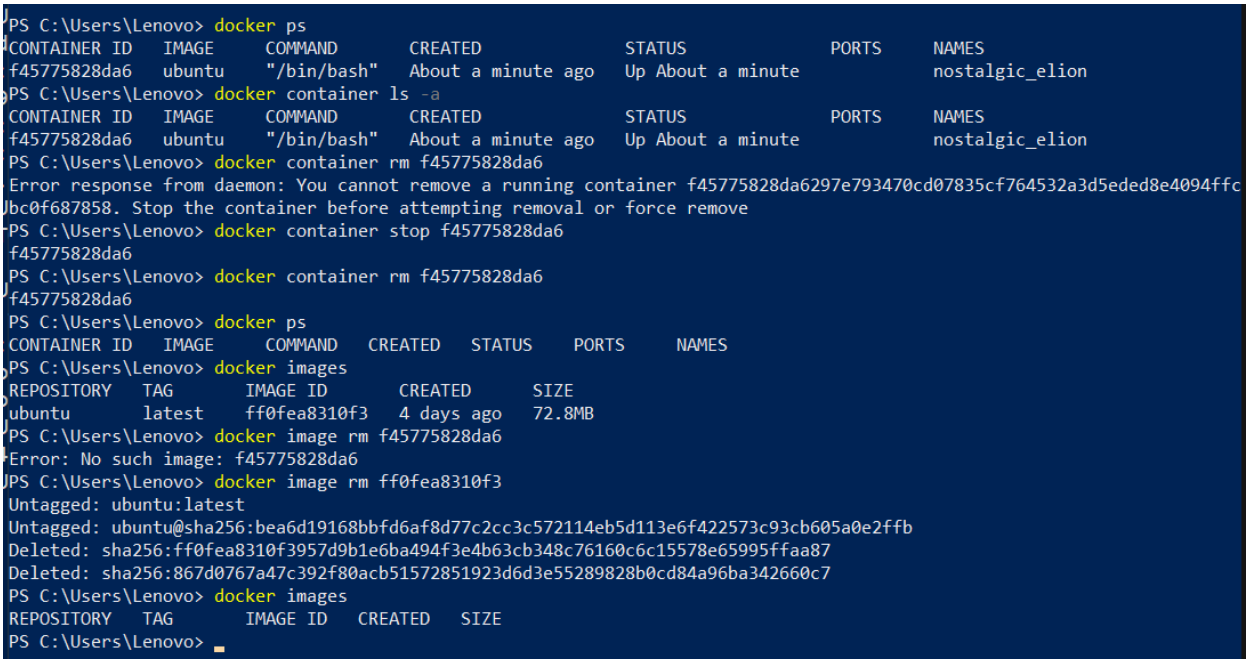
-docker ps

docker container ls –a

docker container rm b71e3e6b1118 //copy docker id for remove but first (Use your container ID in the above command)

stop your docker

- docker container stop b71e3e6b1118
- docker container rm b71e3e6b1118
- docker ps
- docker //list all docker commands
- docker images
- docker image rm ff0fea8310f3 // copy image id from previous output (Use your image ID in the above command)
- docker run -it ubuntu /bin/bash //check output



conclusion:-

Docker is a tool for containerization, allowing you to package and run applications with their dependencies in a consistent environment. It simplifies deployment and scaling, making it easier to develop and manage applications.