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Assignment 7

Aim: Deploy a web application using Docker.

Theory:

1. **What is Docker ?**

   Docker is a containerization platform that allows developers to package an application and its dependencies into a container that can run on any machine with Docker installed.

2. **Docker Architecture:**

   Docker architecture includes three main components: the Docker daemon, the Docker client, and the Docker registry. The Docker daemon is the background service that manages the containers, images, and networks. The Docker client is a command-line interface that allows users to interact with the Docker daemon. The Docker registry is a place where Docker images can be stored and shared.

3. **Difference between Docker and Virtual machine?**

   Docker is different from a virtual machine in that it shares the host operating system's kernel and doesn't require a separate operating system for each container. This means that Docker containers are much lighter and faster to start up than virtual machines.

4. **Docker Commands:**

   Docker commands include docker run, docker build, docker push, docker pull, docker ps, and docker logs. These commands are used to manage Docker containers, images, and networks.

5. **Dockerfile:**

   A Dockerfile is a text file that contains instructions for building a Docker image. It specifies the base image, any additional software packages to install, and any configuration settings needed for the application to run.

6. **Docker-Compose and Docker-swarm:**

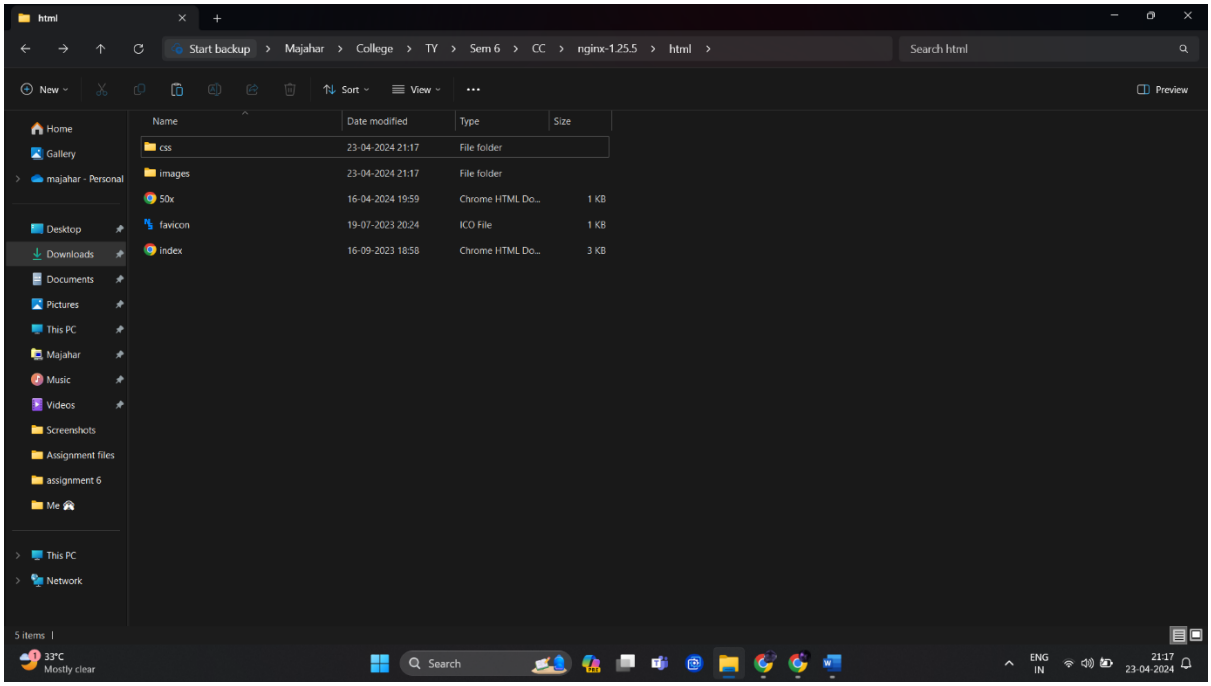
   Docker-compose is a tool for defining and running multi-container Docker applications. Docker-swarm is a tool for managing a cluster of Docker nodes and deploying a Docker stack to that cluster.

Implementation:

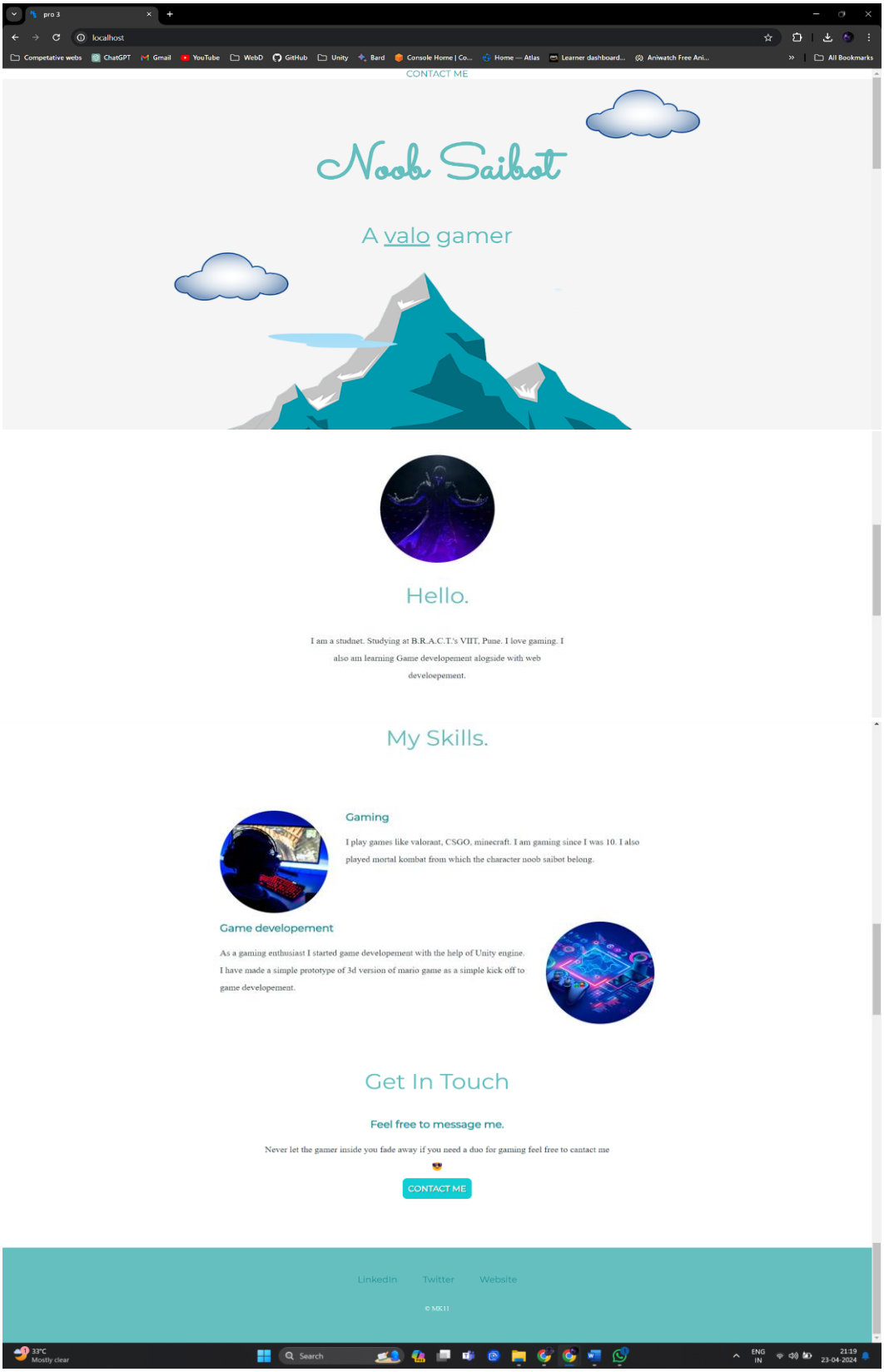
Step 1: Install nginx on windows follow the link:

http://nginx.org/en/docs/windows.html

Step 2: Copy the sample-website in “C:\nginx\html\” folder

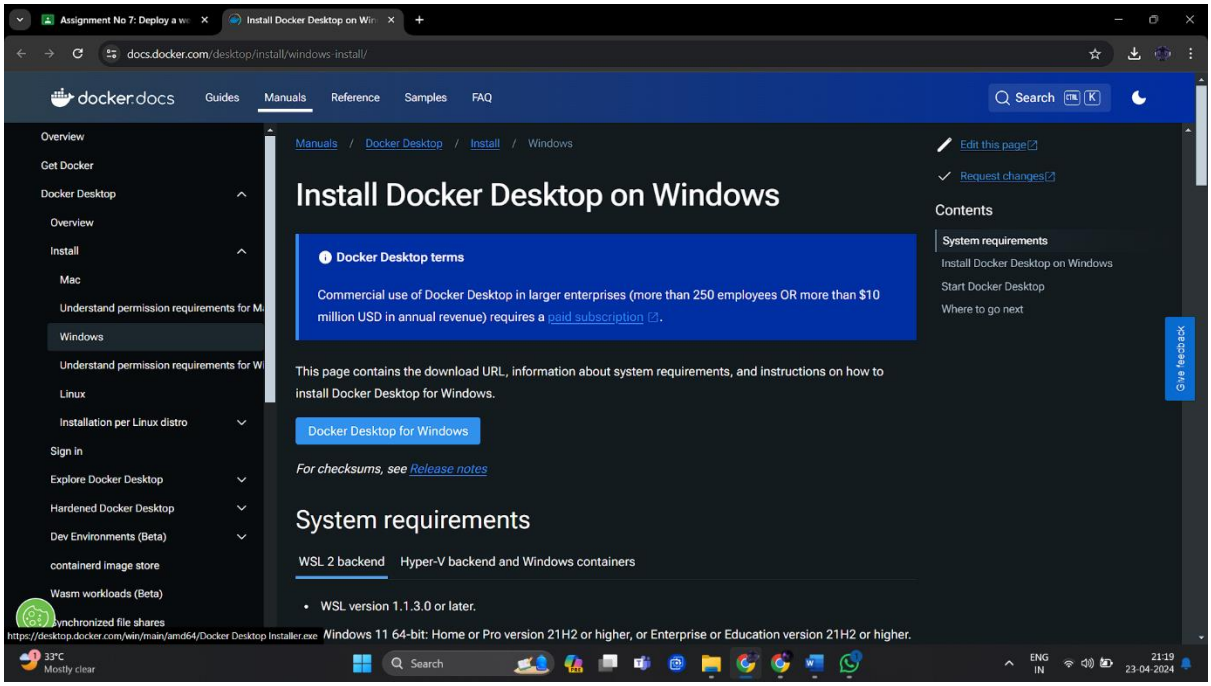


Step 3: open browser and run “localhost:80”



Step 4: Download Docker for windows, follow the link

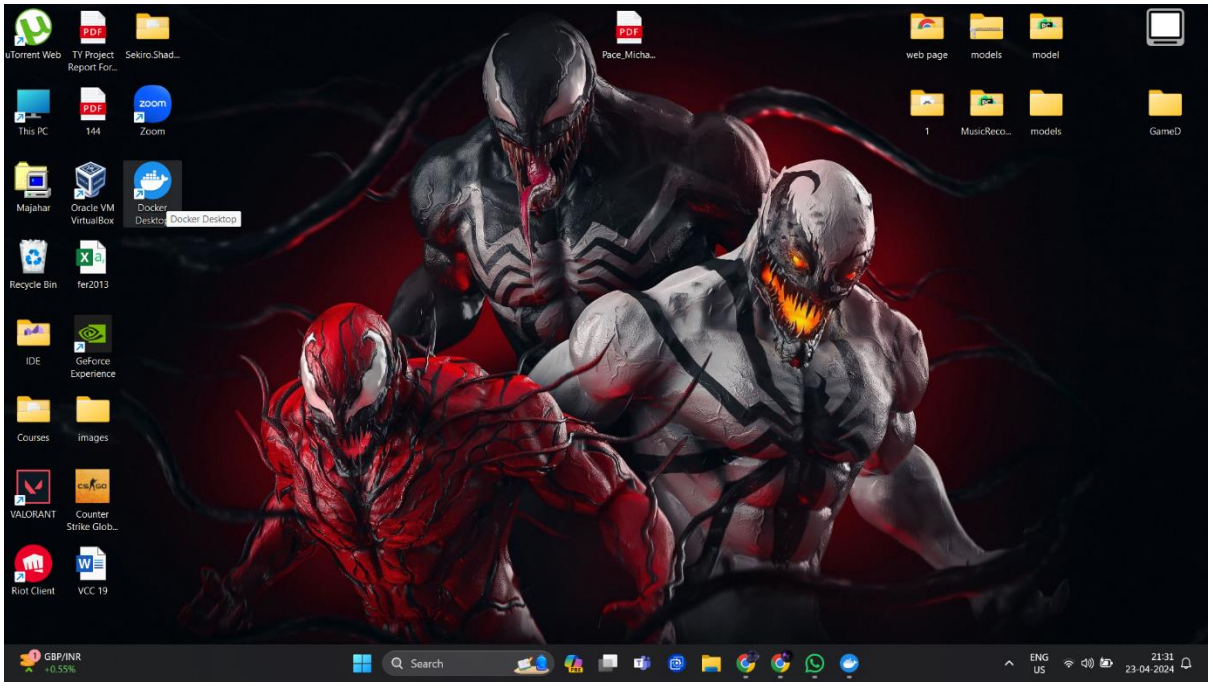
https://docs.docker.com/desktop/install/windows-install/

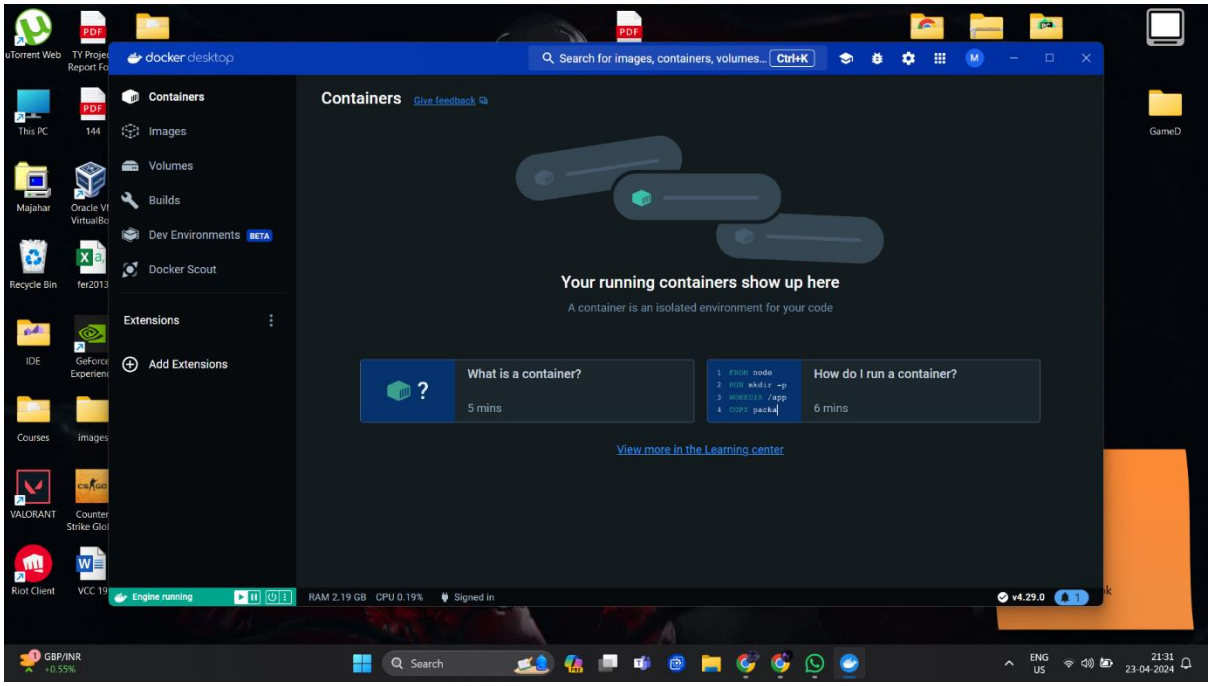


Step 5: Start Docker Desktop

Docker Desktop does not start automatically after installation. To start Docker Desktop:

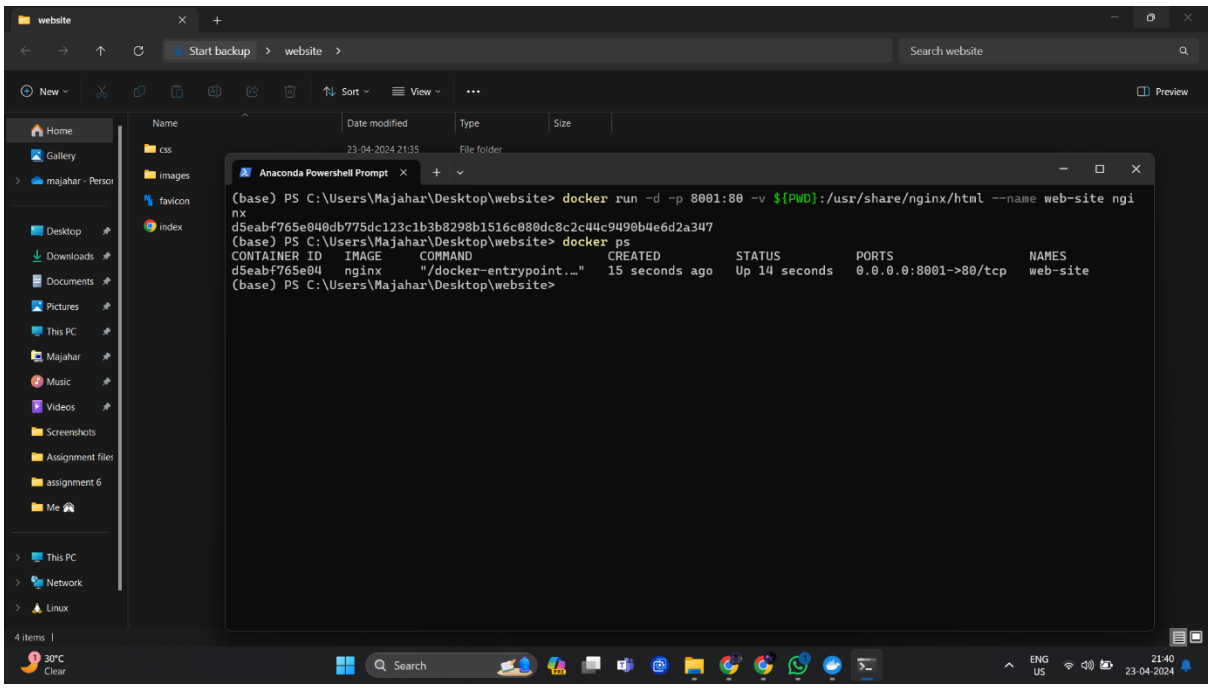
1. Search for Docker, and select Docker Desktop in the search results.





Step 6: Open Powershell and check Docker installation using commands:

a. docker –version



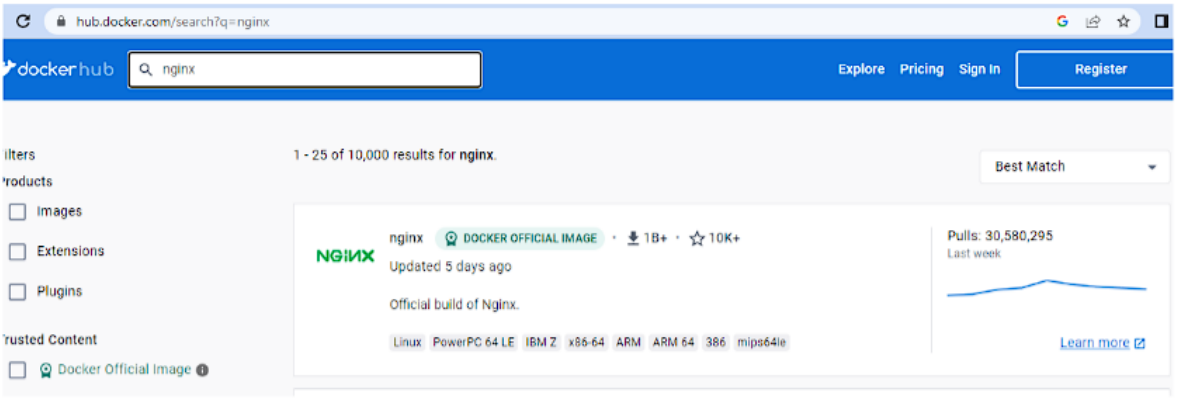
b. docker info

c. docker version –format {{json .}};

Steps to run the “Sample website” in Docker container

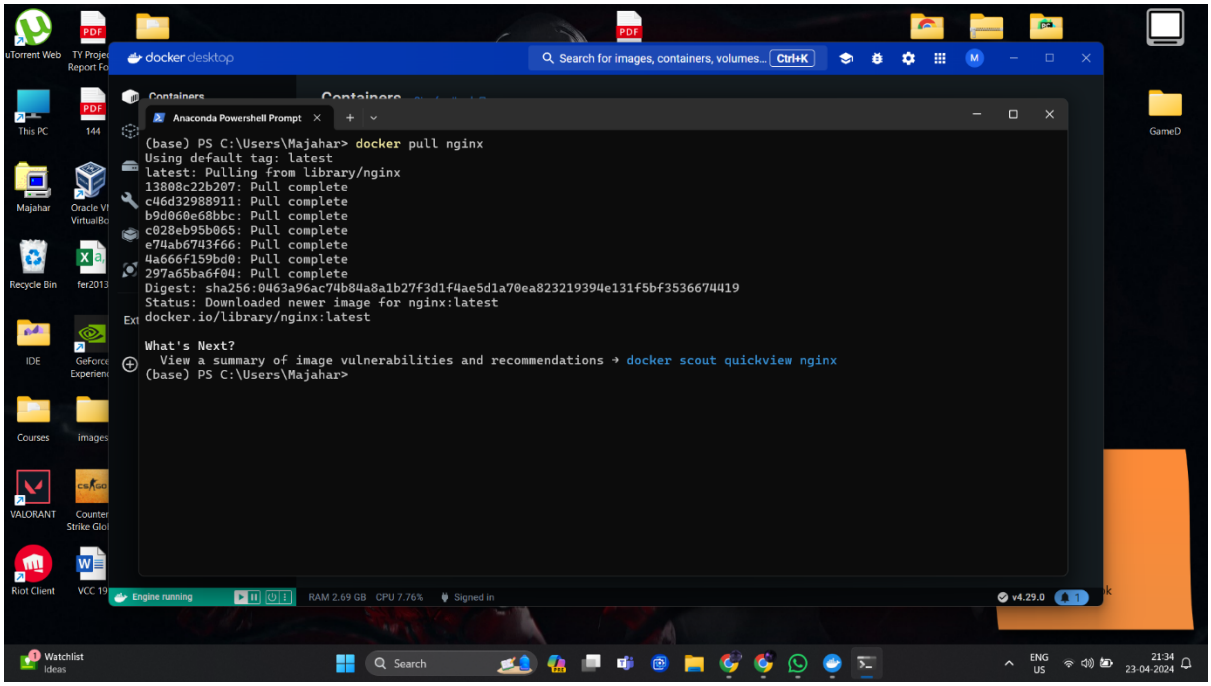
Step 1) visit to Docker hub web site: https://hub.docker.com/

Step 2) search for “nginx” image on site



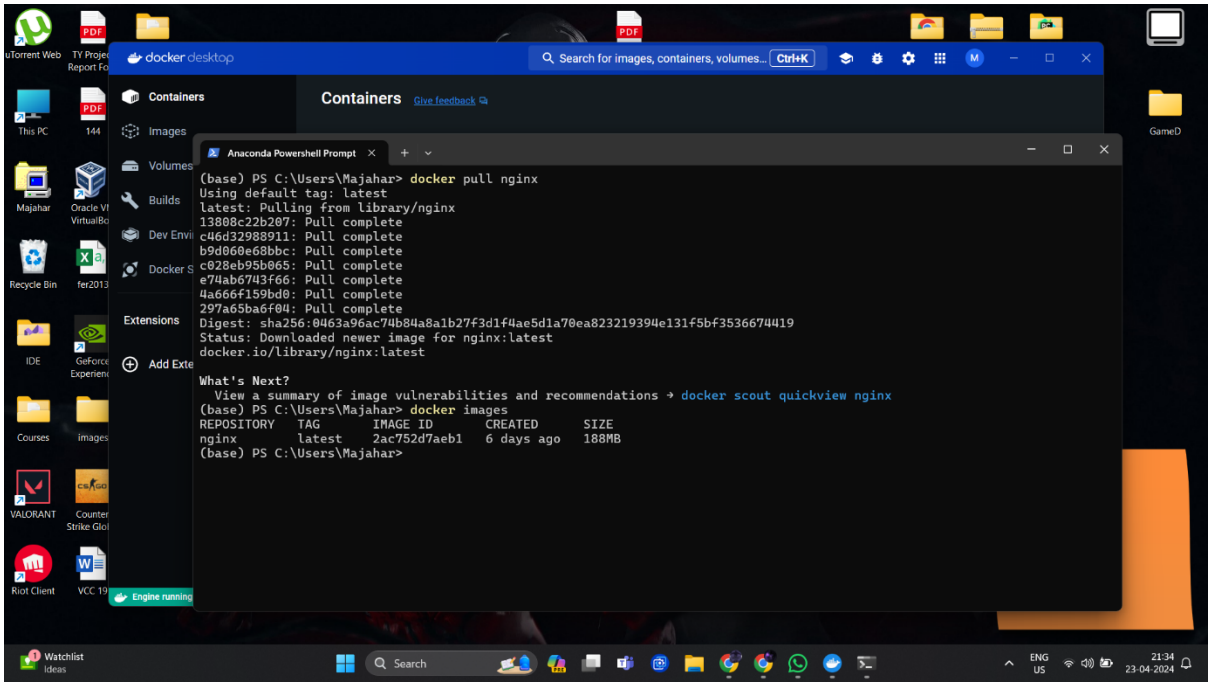
Step 3) pull the latest image of nginx using command

```
docker pull nginx
```



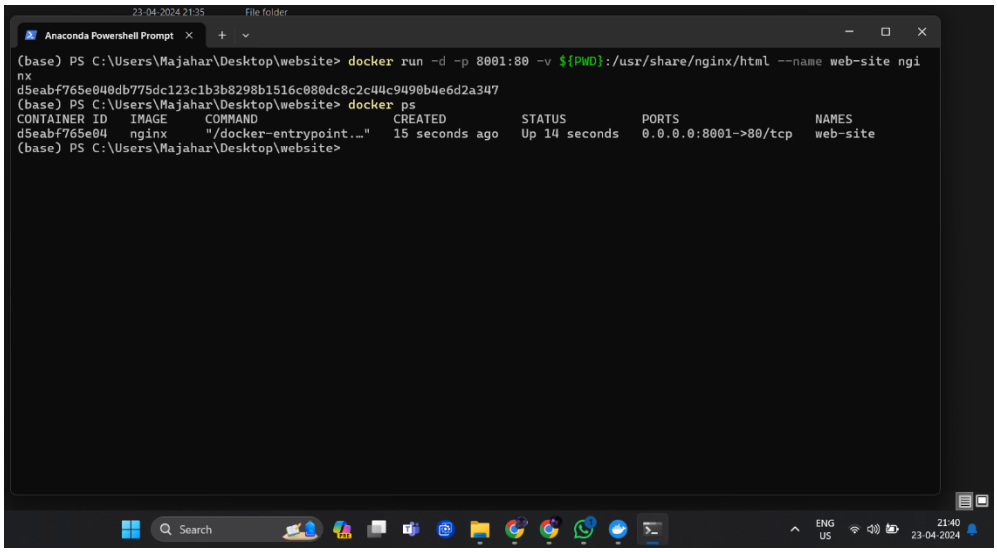
Step 4) check the docker images on your desktop by using command:

docker image



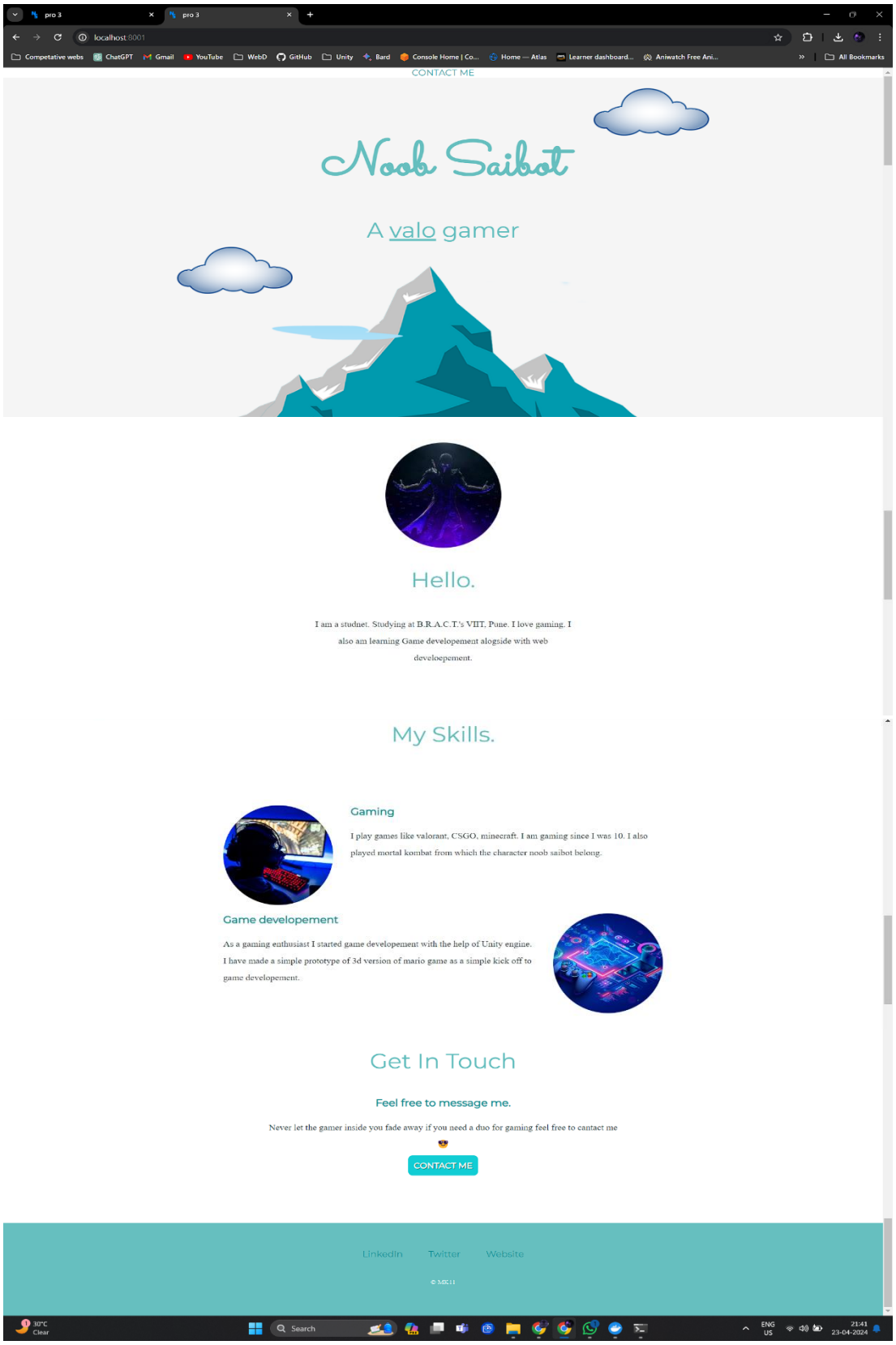
Step 5) go in the "SampleWebsite" folder and then Create a container using the docker command and sync the "SampleWebsite" folder with folder inside the container folder. (This is called Mount Bind")

"docker run -d -p 8001:80 -v ${PWD}:/usr/share/nginx/html --name web-site nginx"



Step 6)verify the website open browser and chec “localhost:8001”. Now this

website is running inside your container.



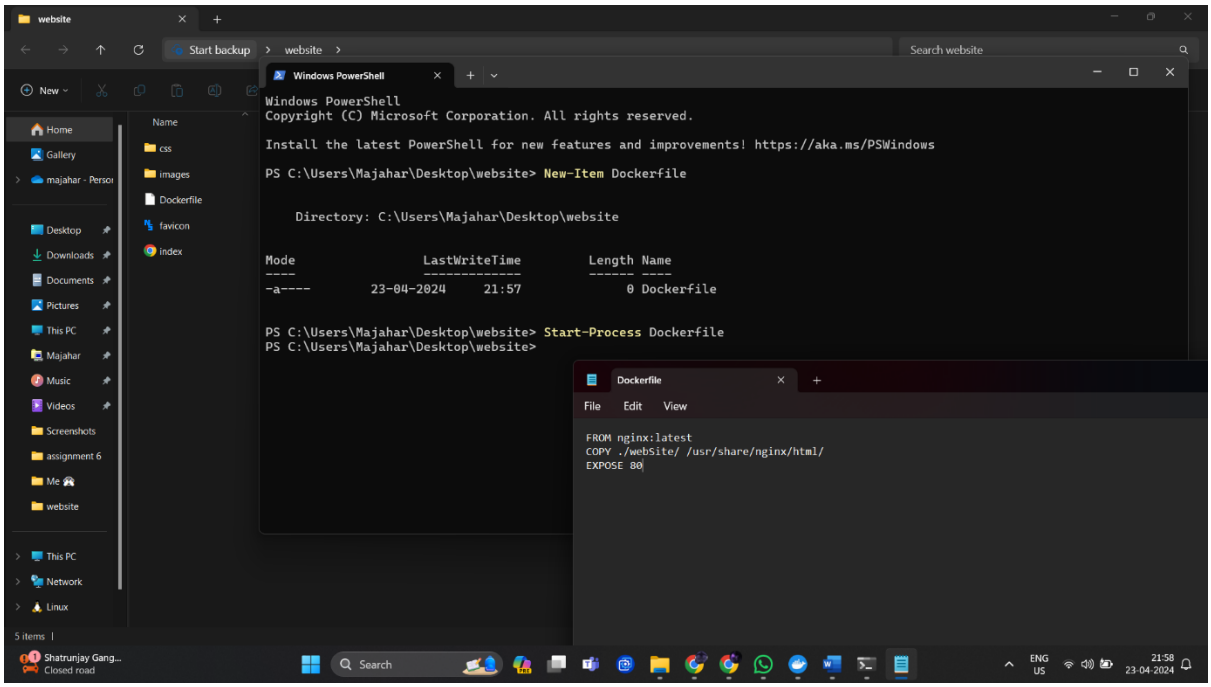
DockerFile

Step 1) Create a Directory structure like

App

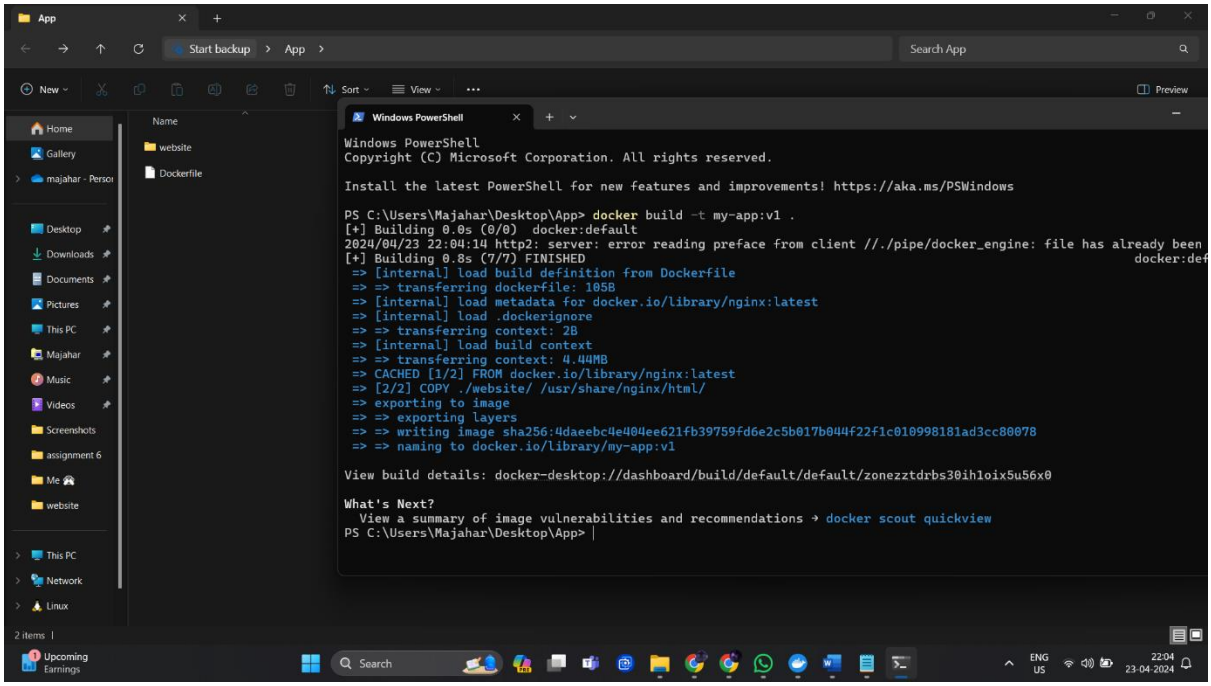
- Website
- Dockerfile

Step 2) Write a following script into “Dockerfile”

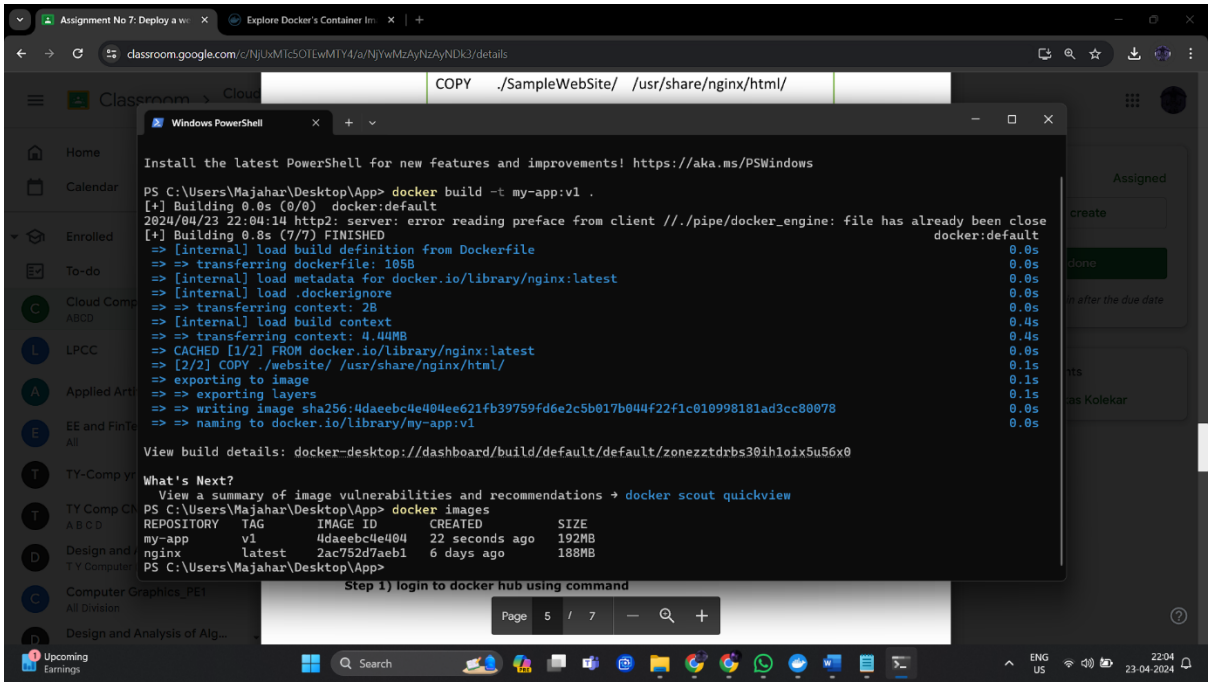


Step 3) build image from docker file using command

“docker build -t my-app:v1 . ”

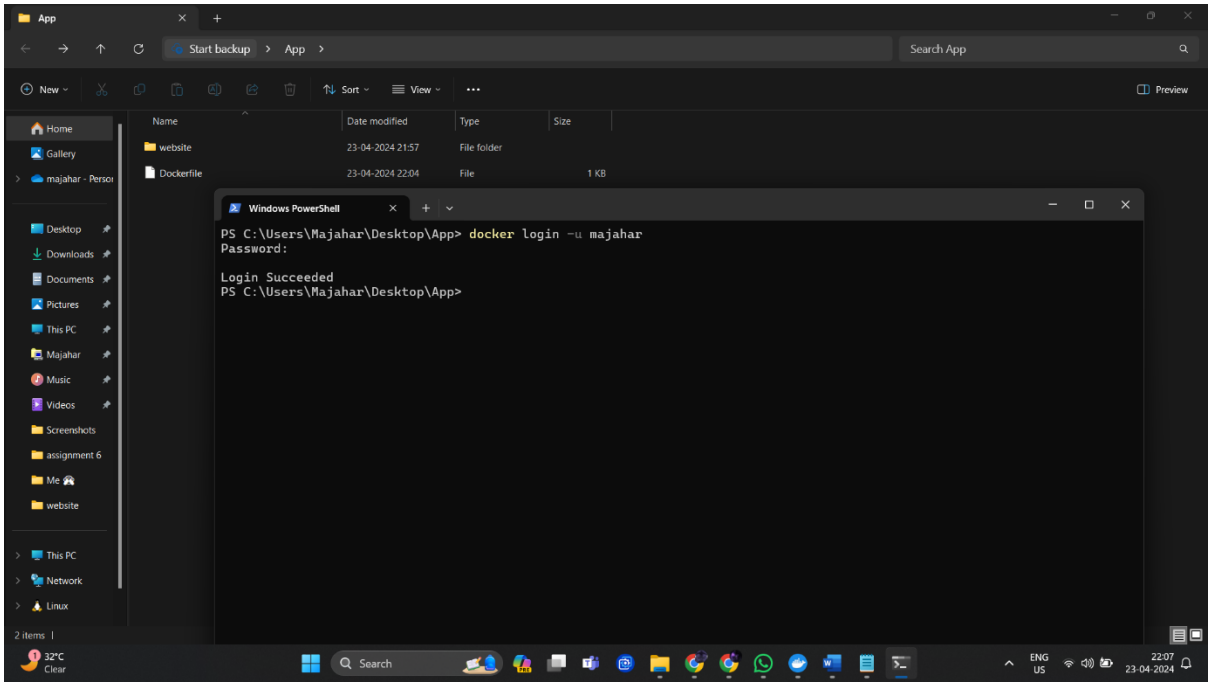


Step 4) check images using command: docker images

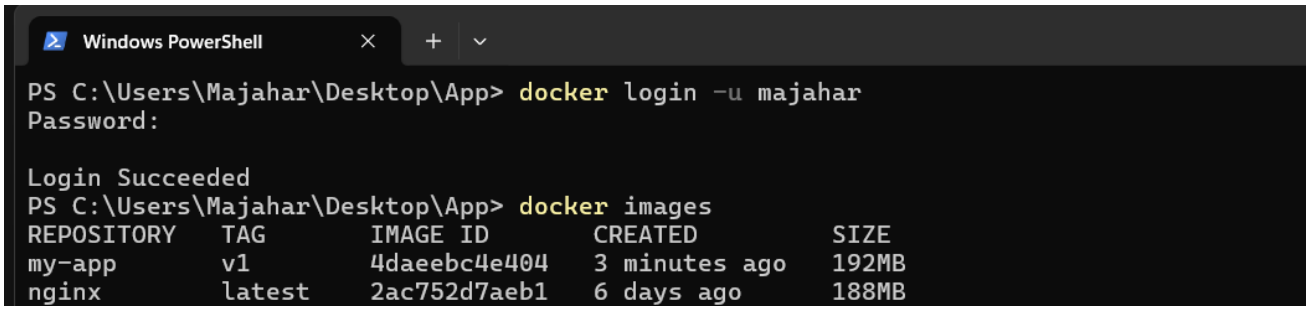


PUSH Image to “DockerHub”

Step 1) login to docker hub using command

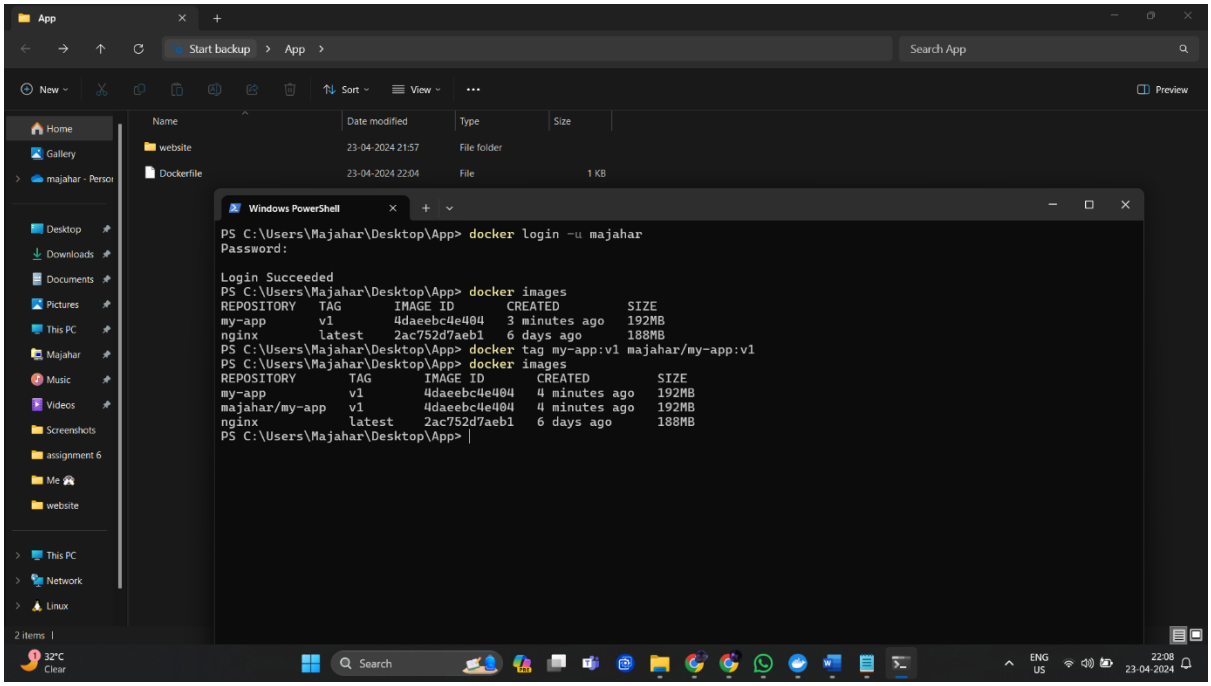


Step 2) docker images

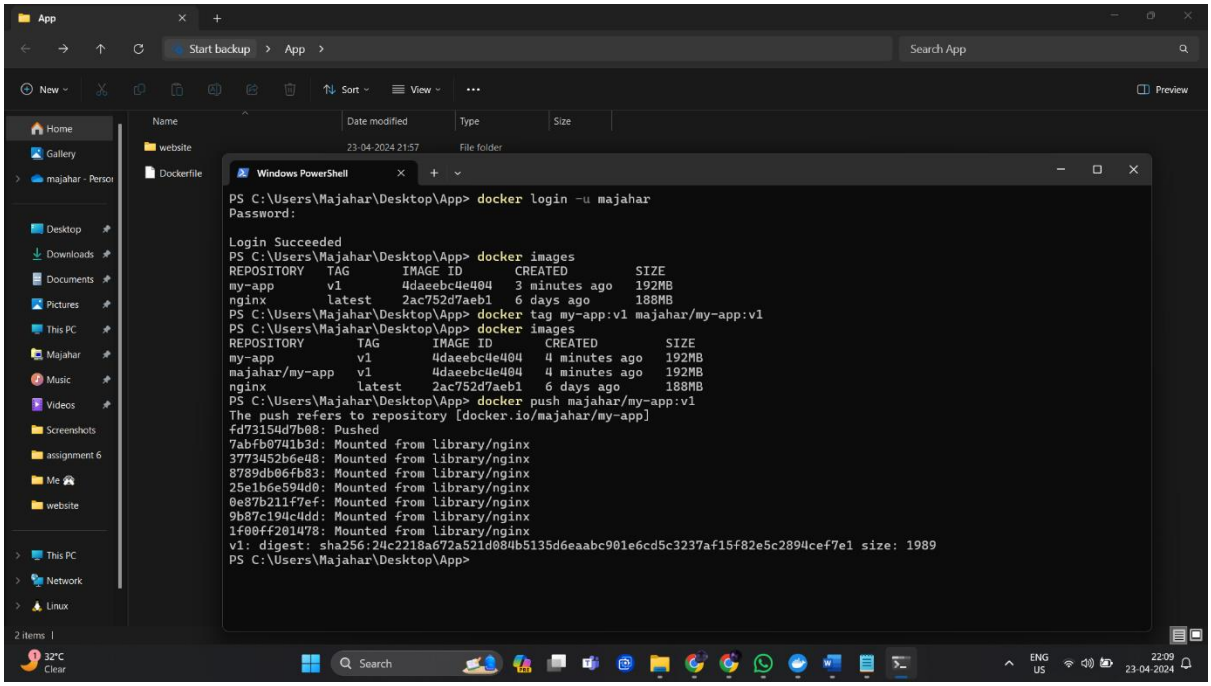


Step 3) docker tag (old image name) majahar/newname

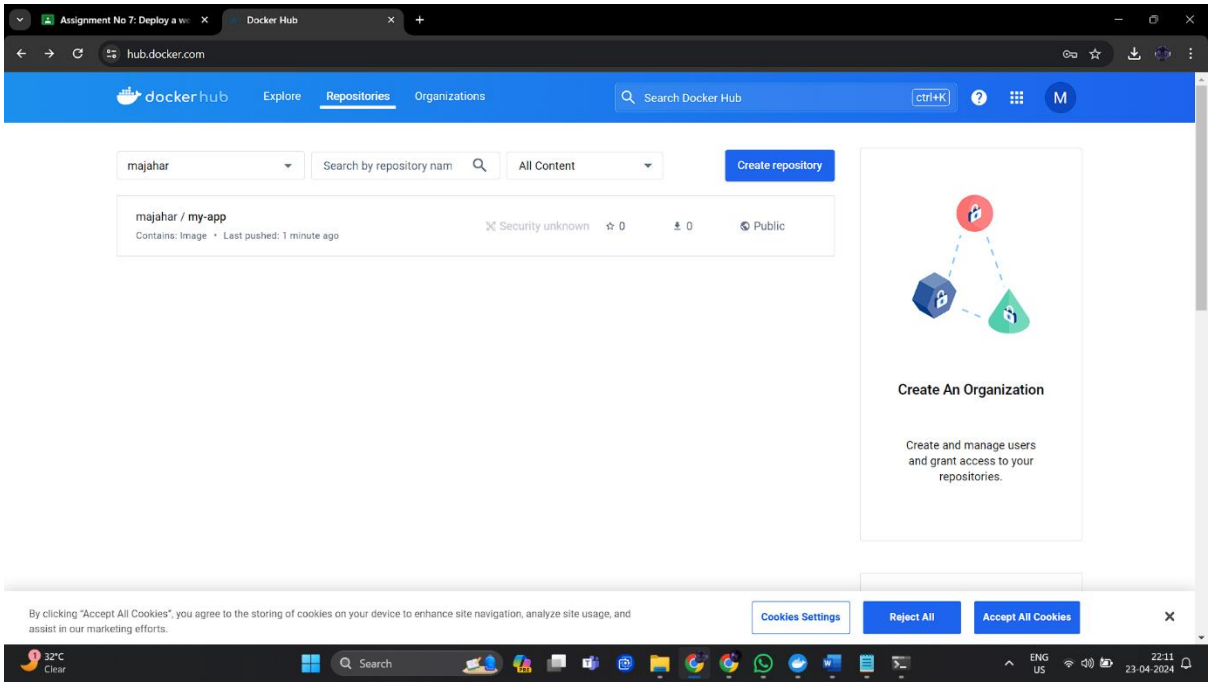
docker tag my-web:v1 majahar/newapp



Step 4) docker push majahar/newapp



Step 5) Login to Docker Hub and check the repository



Congratulations!!!!

Now you can share this image with anyone with running nginx

and your web application.

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Tuesday 23 April 2024 9:04:15 PM IST