

Docker & Docker Hub

Assignment 1:

Demonstrate minimum 15 basic docker command with explanation and screenshot.

Submission Example

`docker images`

Command is used to list all the docker images available locally in your system.

```
avnish@avnish-yadav: ~  
(base) avnish@avnish-yadav:~$ docker images  
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE  
fc                   lts                798cc9fa4cf0       2 days ago         3.6GB  
<none>              <none>             9d5363ff152c       2 days ago         3.6GB  
<none>              <none>             afc978830ad5       2 days ago         2.65GB  
<none>              <none>             ca2c2e784a51       2 days ago         2.65GB  
<none>              <none>             d49cb28c9a07       2 days ago         2.65GB  
<none>              <none>             b076b3e07ef8       2 days ago         2.65GB  
<none>              <none>             7baa35069e12       2 days ago         2.65GB  
<none>              <none>             970795145d9a       2 days ago         2.65GB
```

Ans. The docker commands are as follows:-

1. **`docker --version` → shows installed docker version.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment  
$ docker --version  
Docker version 20.10.17, build 100c701
```

2. **`docker pull [docker_image]:[TAG]` → download an image from DockerHub.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment  
$ docker pull hello-world  
Using default tag: latest  
latest: Pulling from library/hello-world  
2db29710123e: Pull complete  
Digest: sha256:18a657d0cc1c7d0678a3fbea8b7eb4918bba25968d3e1b0adebfa71caddbc346  
Status: Downloaded newer image for hello-world:latest  
docker.io/library/hello-world:latest
```

3. **docker images** → list all the docker images available locally in your system.

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker images
REPOSITORY          TAG         IMAGE ID      CREATED        SIZE
welcome-app         latest      3a0956f1fb0e  2 days ago    1.06GB
mohitmahi/welcome-app latest      3a0956f1fb0e  2 days ago    1.06GB
hello-world         latest      feb5d9fea6a5  12 months ago 13.3kB
```

4. **docker rmi -f [docker_image]** → delete docker image forcefully.

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker rmi -f hello-world
Untagged: hello-world:latest
Untagged: hello-world@sha256:18a657d0cc1c7d0678a3fbea8b7eb4918bba25968d3e1b0adebfa71caddb
c346
Deleted: sha256:feb5d9fea6a5e9606aa995e879d862b825965ba48de054caab5ef356dc6b3412
```

5. **docker run [docker_image]** → Start a new container from an image.

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ 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/
```

6. **docker build -t [image_name] . → build an image from Dockerfile.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker build -t welcome_app .
[+] Building 42.3s (10/10) FINISHED
=> [internal] load build definition from Dockerfile 0.1s
=> => transferring dockerfile: 150B 0.0s
=> [internal] load .dockerignore 0.1s
=> => transferring context: 2B 0.0s
=> [internal] load metadata for docker.io/library/python:3.7 3.9s
=> [auth] library/python:pull token for registry-1.docker.io 0.0s
=> [internal] load build context 0.0s
=> => transferring context: 497B 0.0s
=> CACHED [1/4] FROM docker.io/library/python:3.7@sha256:51dcbb98ba807f3631366d5a 0.0s
=> [2/4] COPY . /app 0.1s
=> [3/4] WORKDIR /app 0.1s
=> [4/4] RUN pip install -r requirements.txt 36.4s
=> exporting to image 1.5s
=> => exporting layers 1.4s
=> => writing image sha256:b0b8de4dbf99f6ad7360ae712d00aaaf7309e1175311670d311259 0.0s
=> => naming to docker.io/library/welcome_app 0.0s
```

7. **docker run -d -p HostPort:ContainerPort image_name → start a new container in background or detached mode and map a port.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker run -d -p 8000:8000 welcome_app
39e709b8e7c4c0657e7cabf1b211d0c97e7ba5721f4dde14218b643c505b7212
```

8. **docker ps → Shows a list of running containers.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                               NAMES
39e709b8e7c4   welcome_app    "python app.py"         16 seconds ago Up 14 seconds  0.0.0.0:8000->8000/tcp             musing_driscoll
```

9. **docker stop [Container_ID] → stops a running container.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker stop 39e709b8e7c4
39e709b8e7c4
```

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                               NAMES
```

10. **docker start [Container_ID] → Start a stopped container.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker start be043bb7f8a9
be043bb7f8a9
```

11. **docker rm -f [Container_ID] → removes the running container.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker rm -f 16b889733ce1
16b889733ce1

91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
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12. **docker rm [Container_ID] → removes a container.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker stop be043bb7f8a9
be043bb7f8a9

91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker rm be043bb7f8a9
be043bb7f8a9
```

13. **docker rename OLD_NAME NEW_NAME → Rename a container.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
0405321aab0f	welcome_app	"python app.py"	4 minutes ago	Up 3 minutes	0.0.0.0:8000->8000/tcp	strange_mendel

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker rename strange_mendel mohit-Container

91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
0405321aab0f	welcome_app	"python app.py"	8 minutes ago	Up 8 minutes	0.0.0.0:8000->8000/tcp	mohit-Container

14. **docker push [Image_name:TAG] → Upload a docker image from DockerHub.**

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_with_FastAPI
$ docker push mohitmahi/hello_fastapi:latest
The push refers to repository [docker.io/mohitmahi/hello_fastapi]
cfb9d9838ed3: Pushed
5fe4c93ed190: Pushed
5f70bf18a086: Pushed
dc2c0b6f5058: Pushed
4cfc86a86dc9: Pushed
634bb2b2ca8e: Pushed
80bc379fe03f: Pushed
0c7daf9a72c8: Pushed
75ba02937496: Pushed
288cf3a46e32: Pushed
186da837555d: Pushed
955c9335e041: Pushed
8e079fee2186: Pushed
latest: digest: sha256:1a04aeabfd36d012506da159c8b2b4659714f60186785c5736a0d3edf82a3e92 size: 3053
```

15. **docker log [Container_ID] → show logs of the container.**

```
(base)
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_with_FastAPI
$ docker logs 539620f2c9f6
INFO:      Will watch for changes in these directories: ['/app']
INFO:      Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to qu
it)
INFO:      Started reloader process [1] using StatReload
INFO:      Started server process [8]
INFO:      Waiting for application startup.
INFO:      Application startup complete.
```

Assignment 2:

Hello World Docker Image Run Hello World Docker Image Locally.

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:18a657d0cc1c7d0678a3fbea8b7eb4918bba25968d3e1b0adebfa71
caddbc346
Status: Downloaded newer image for hello-world:latest
docker.io/library/hello-world:latest

91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
welcome-app         latest      3a0956f1fb0e  2 days ago   1.06GB
mohitmahi/welcome-app latest      3a0956f1fb0e  2 days ago   1.06GB
hello-world         latest      feb5d9fea6a5  12 months ago 13.3kB

91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_Assignment
$ 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:
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 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.

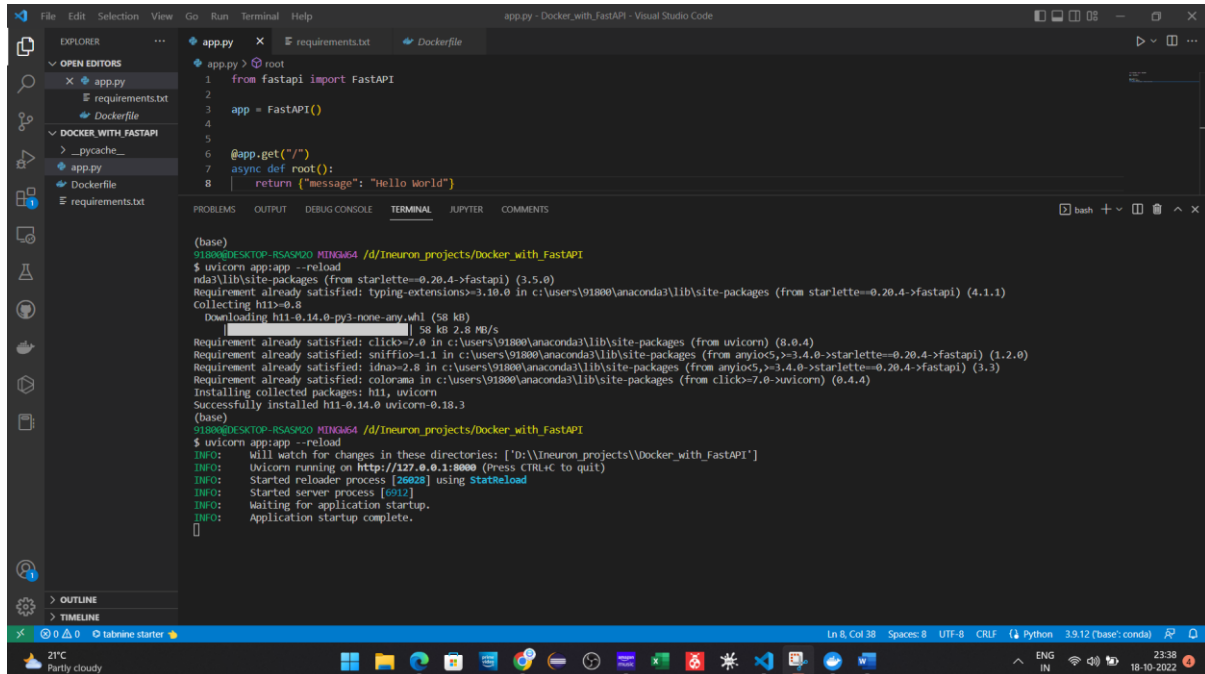
To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

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For more examples and ideas, visit:
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```

Assignment 3:

Create a hello world fastapi application. Create a Dockerfile for your fastapi hello world application. Build Docker image using Docker file. Run docker image build in previous step. Push your Docker image to Docker Hub.

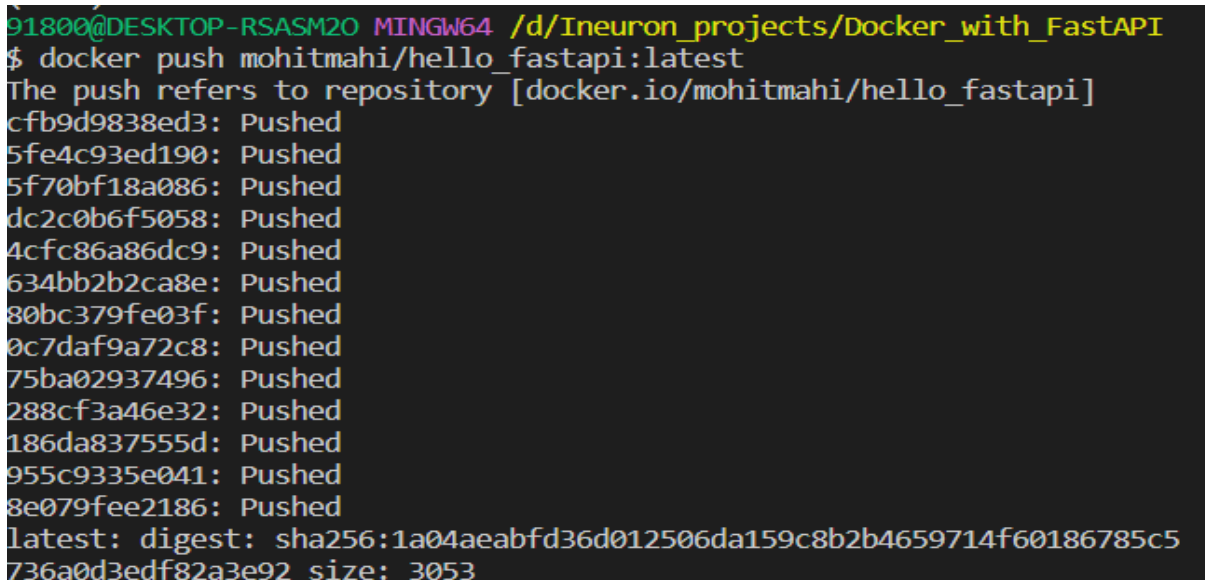


The screenshot shows the Visual Studio Code interface with a project named 'app.py - Docker_with_FastAPI'. The Explorer sidebar on the left shows the file structure with 'app.py', 'requirements.txt', and 'Dockerfile'. The main editor displays the 'app.py' file with the following code:

```
1 from fastapi import FastAPI
2
3 app = FastAPI()
4
5
6 @app.get("/")
7 async def root():
8     return {"message": "Hello World"}
```

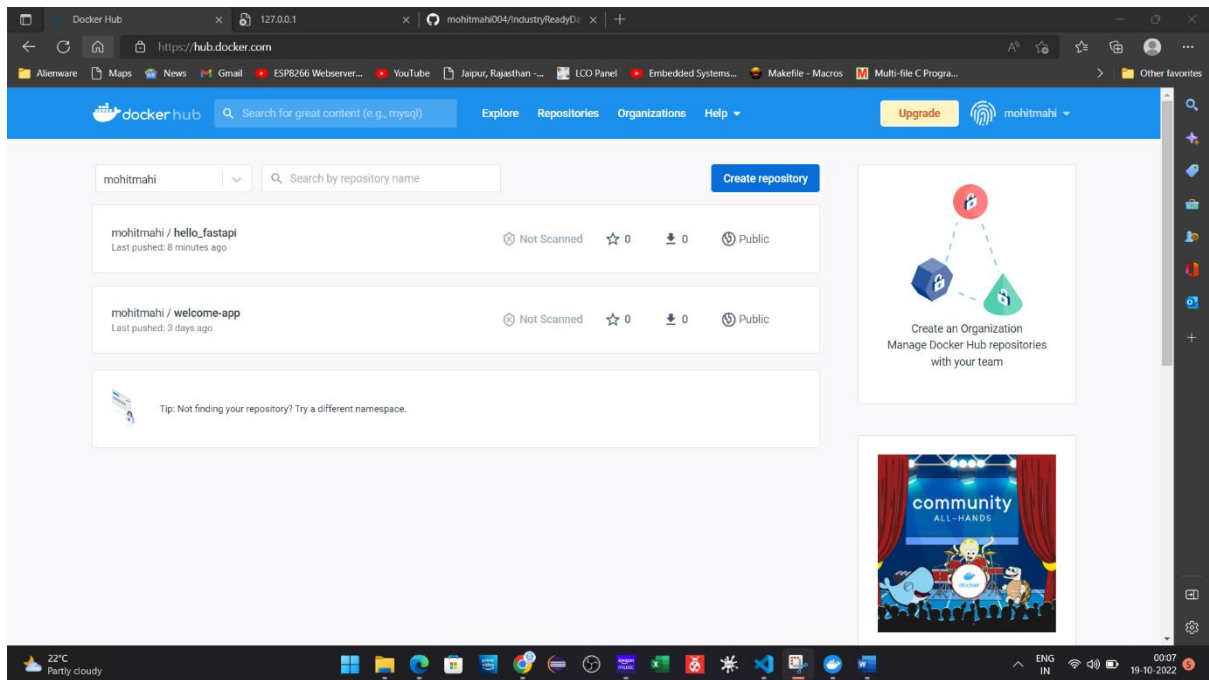
The TERMINAL panel at the bottom shows the command prompt output for running the application:

```
(base)
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_with_FastAPI
$ uvicorn app:app --reload
nd3\lib\site-packages (from starlette==0.20.4->fastapi) (3.5.0)
Requirement already satisfied: typing-extensions>=3.10.0 in c:\users\91800\anaconda3\lib\site-packages (from starlette==0.20.4->fastapi) (4.1.1)
collecting h11==0.8
Downloading h11-0.14.0-py3-none-any.whl (58 kB)
Requirement already satisfied: click=7.0 in c:\users\91800\anaconda3\lib\site-packages (from uvicorn) (8.0.4)
Requirement already satisfied: sniffio=1.1 in c:\users\91800\anaconda3\lib\site-packages (from anyio<5,>=3.4.0->starlette==0.20.4->fastapi) (1.2.0)
Requirement already satisfied: idna>=2.8 in c:\users\91800\anaconda3\lib\site-packages (from anyio<5,>=3.4.0->starlette==0.20.4->fastapi) (3.3)
Requirement already satisfied: colorama in c:\users\91800\anaconda3\lib\site-packages (from click=7.0->uvicorn) (0.4.4)
Installing collected packages: h11, uvicorn
Successfully installed h11-0.14.0 uvicorn-0.18.3
(base)
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_with_FastAPI
$ uvicorn app:app --reload
INFO: Will watch for changes in these directories: ['D:\Ineuron_projects\docker_with_FastAPI']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reload process [26028] using Starlette
INFO: Started server process [6912]
INFO: Waiting for application startup.
INFO: Application startup complete.
```



The screenshot shows a terminal window with the following output:

```
91800@DESKTOP-RSASM20 MINGW64 /d/Ineuron_projects/Docker_with_FastAPI
$ docker push mohitmahi/hello_fastapi:latest
The push refers to repository [docker.io/mohitmahi/hello_fastapi]
cfb9d9838ed3: Pushed
5fe4c93ed190: Pushed
5f70bf18a086: Pushed
dc2c0b6f5058: Pushed
4cfc86a86dc9: Pushed
634bb2b2ca8e: Pushed
80bc379fe03f: Pushed
0c7daf9a72c8: Pushed
75ba02937496: Pushed
288cf3a46e32: Pushed
186da837555d: Pushed
955c9335e041: Pushed
8e079fee2186: Pushed
latest: digest: sha256:1a04aeabfd36d012506da159c8b2b4659714f60186785c5
736a0d3edf82a3e92 size: 3053
```

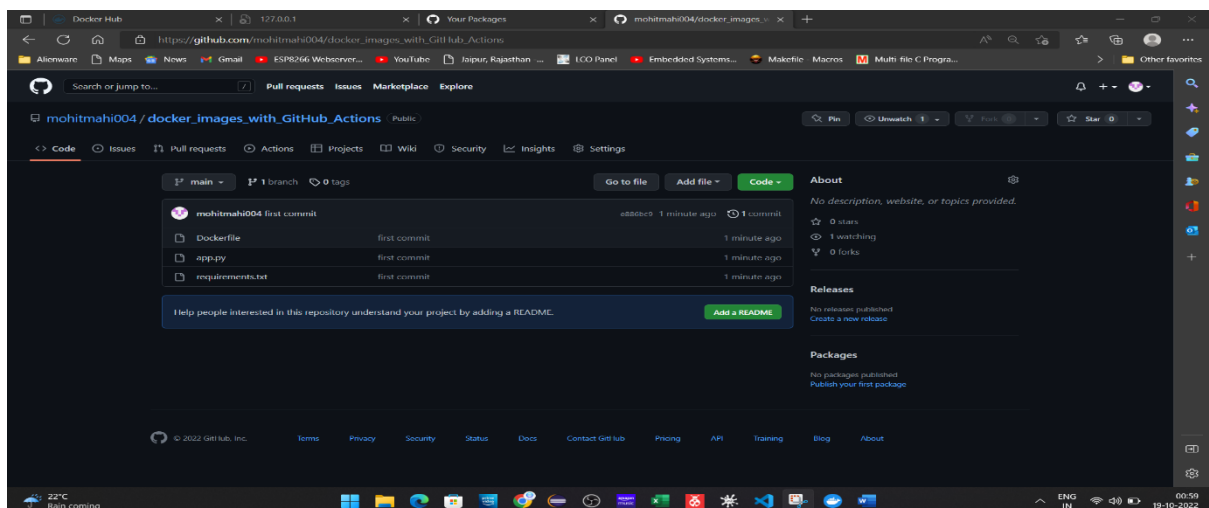


Assignment 4:

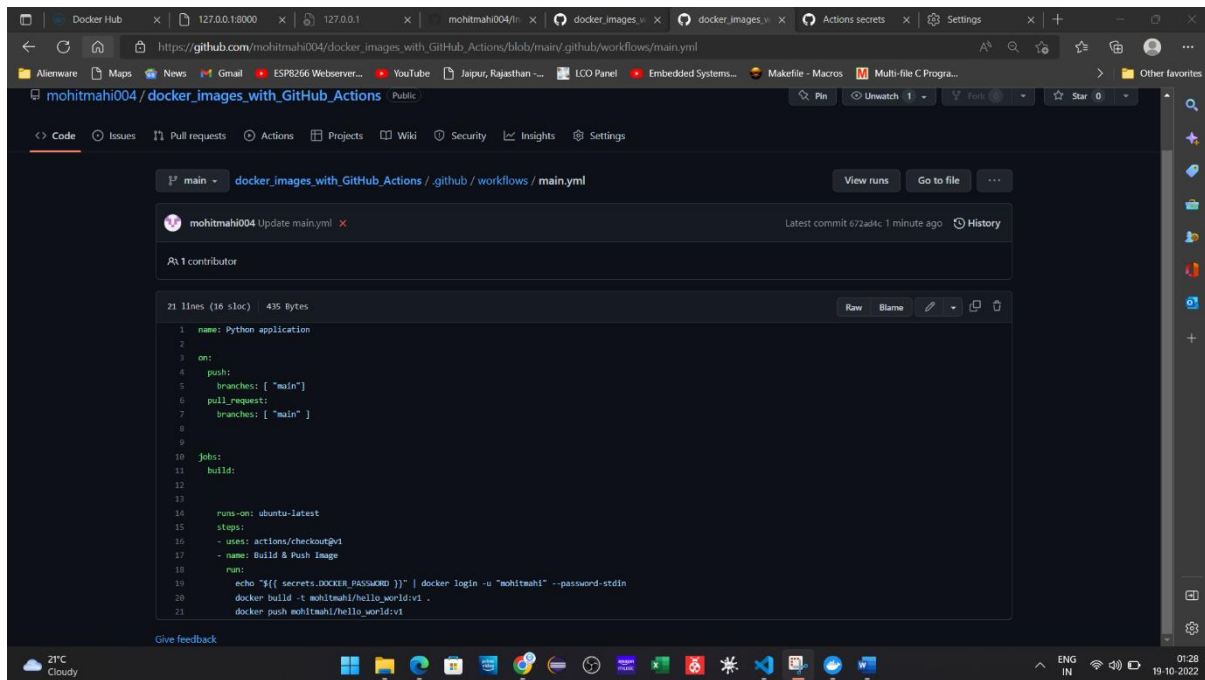
Automate Assignment below task using github action.

1. Build Docker Image
2. Push Docker Image to Docker hub.

1. Adding files to github



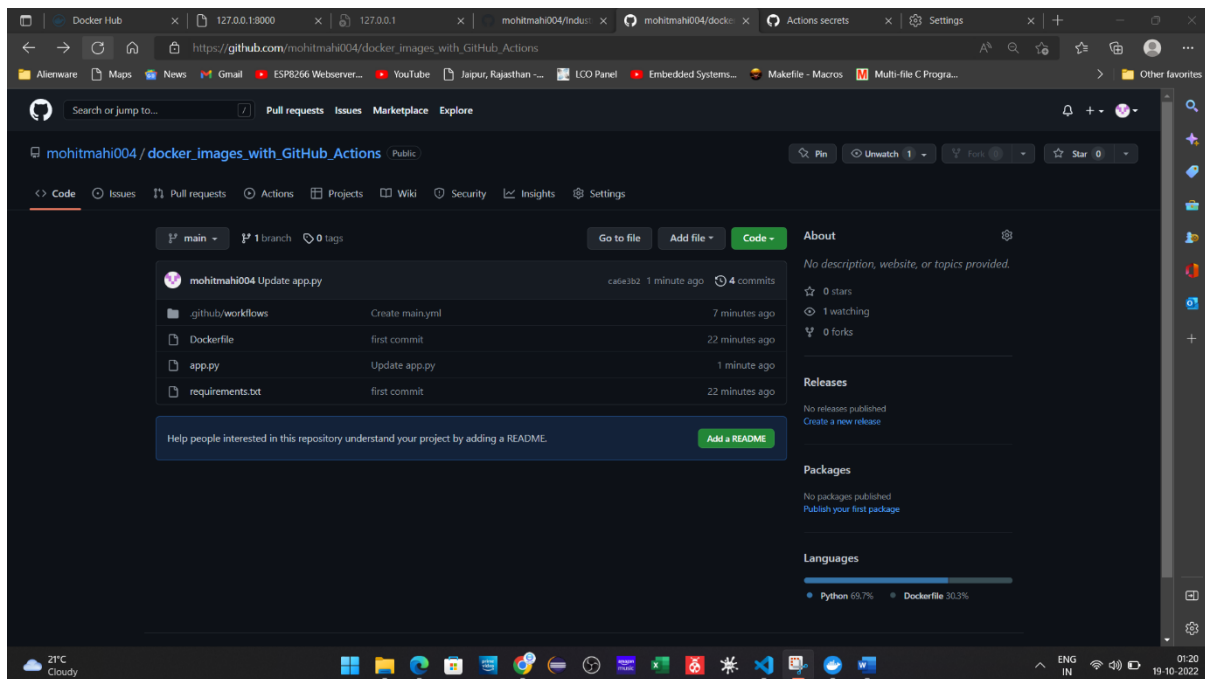
2. Adding main.yml file from GitHub Action.



The screenshot shows the GitHub repository page for `mohitmahi004/docker_images_with_GitHub_Actions`. The `main` branch is selected, and the file `.github/workflows/main.yml` is open. The file content is as follows:

```
1 name: Python application
2
3 on:
4   push:
5     branches: [ "main" ]
6   pull_request:
7     branches: [ "main" ]
8
9
10 jobs:
11   build:
12
13     runs-on: ubuntu-latest
14     steps:
15       - uses: actions/checkout@v1
16       - name: Build & Push Image
17         run: |
18           echo "${{ secrets.DOCKER_PASSWORD }}" | docker login -u "mohitmahi" --password-stdin
19           docker build -t mohitmahi/hello_world:v1 .
20           docker push mohitmahi/hello_world:v1
```

3. Update the app.py file.



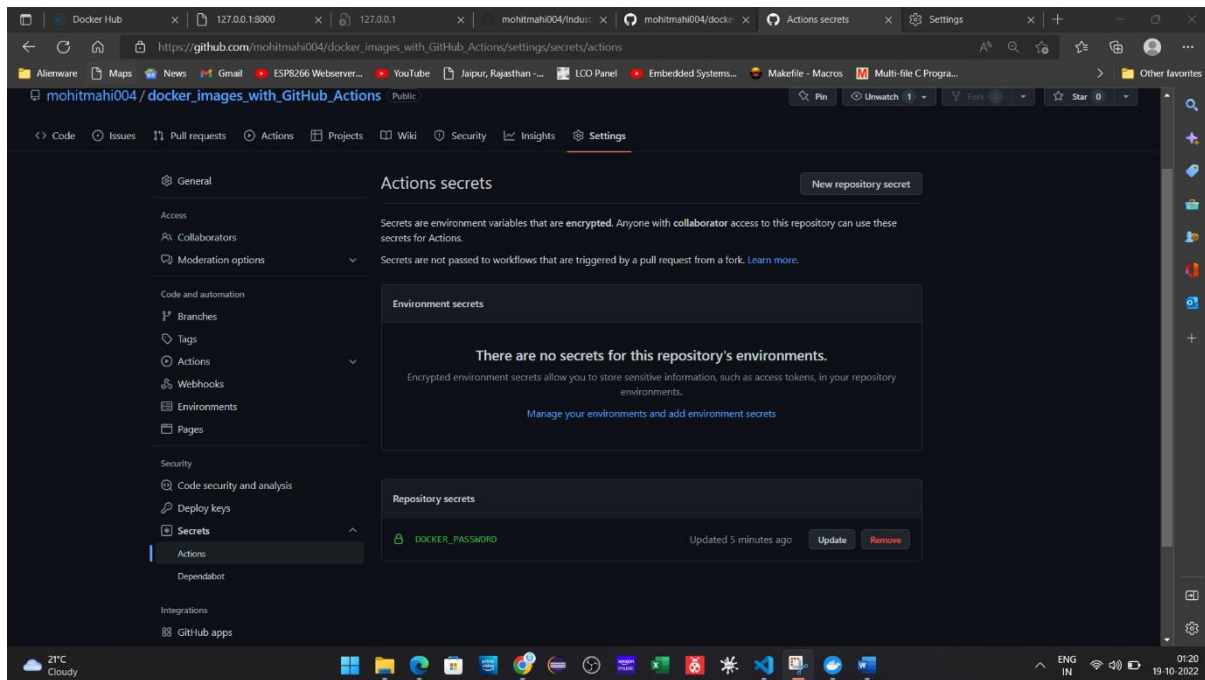
The screenshot shows the GitHub repository page for `mohitmahi004/docker_images_with_GitHub_Actions`. The `main` branch is selected, and the file list is displayed. The file list shows the following files and their commit history:

File	Commit	Time
<code>.github/workflows</code>	Create main.yml	7 minutes ago
<code>Dockerfile</code>	first commit	22 minutes ago
<code>app.py</code>	Update app.py	1 minute ago
<code>requirements.txt</code>	first commit	22 minutes ago

The commit history for `app.py` shows 4 commits. The repository also has a section for `Releases` and `Packages`, both of which are currently empty. The `Languages` section shows the following distribution:

- Python: 69.7%
- Dockerfile: 30.3%

4. Create a secret named as DOCKER_PASSWORD



5. Finally, go to Actions and see the workflow of main.yml file.

