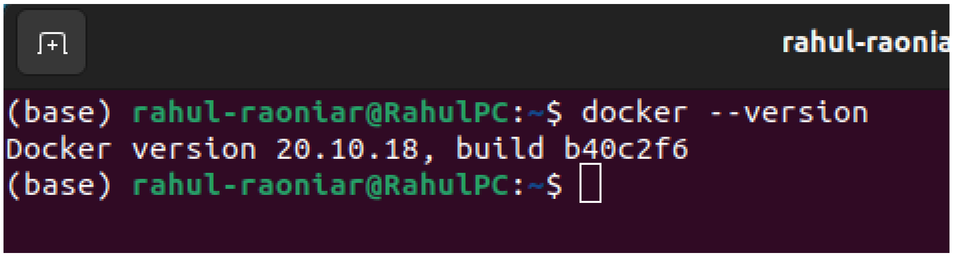
Assignment 1

Tasks:

1. Demonstrate minimum of 15 basic docker commands with an explanation and screenshot.

Docker version

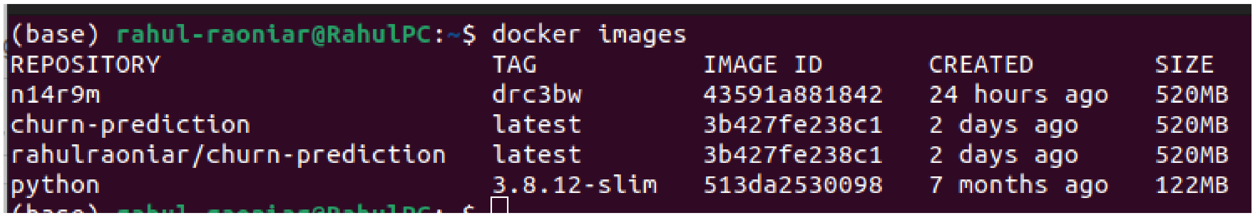
$ docker –version : to check docker version



```
(base) rahul-raoniar@RahulPC:~$ docker --version
Docker version 20.10.18, build b40c2f6
(base) rahul-raoniar@RahulPC:~$ 
```

Existing docker images

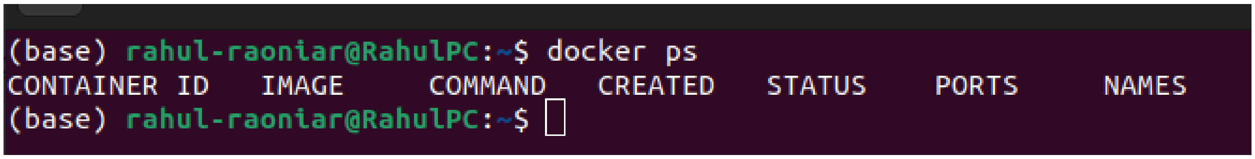
$ docker images



```
(base) rahul-raoniar@RahulPC:~$ docker images
REPOSITORY                     TAG           IMAGE ID       CREATED         SIZE
n14r9m                         drc3bw        43591a881842   24 hours ago    520MB
churn-prediction               latest        3b427fe238c1   2 days ago      520MB
rahulraoniar/churn-prediction  latest        3b427fe238c1   2 days ago      520MB
python                         3.8.12-slim   513da2530098   7 months ago    122MB
```

Show live containers (running)

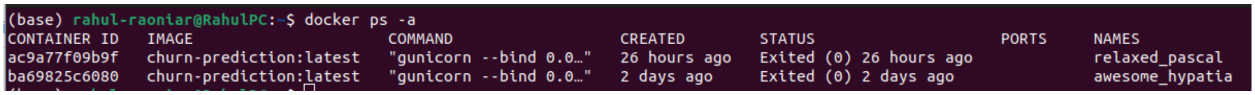
$ running containers



```
(base) rahul-raoniar@RahulPC:~$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
(base) rahul-raoniar@RahulPC:~$ 
```

showing all containers (irrespective of running or not)

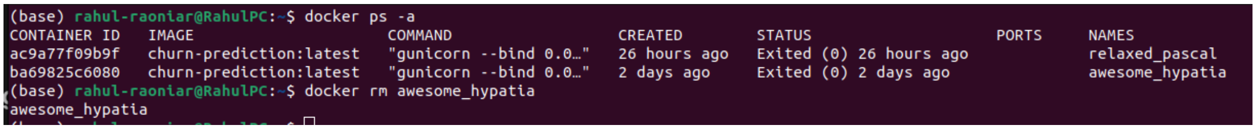
$ docker ps -a



```
(base) rahul-raoniar@RahulPC:~$ docker ps -a
CONTAINER ID   IMAGE                     COMMAND                  CREATED          STATUS                      PORTS     NAMES
ac9a77f09b9f   churn-prediction:latest   "gunicorn --bind 0.0…"   26 hours ago     Exited (0) 26 hours ago               relaxed_pascal
ba69825c6080   churn-prediction:latest   "gunicorn --bind 0.0…"   2 days ago       Exited (0) 2 days ago                 awesome_hypatia
```

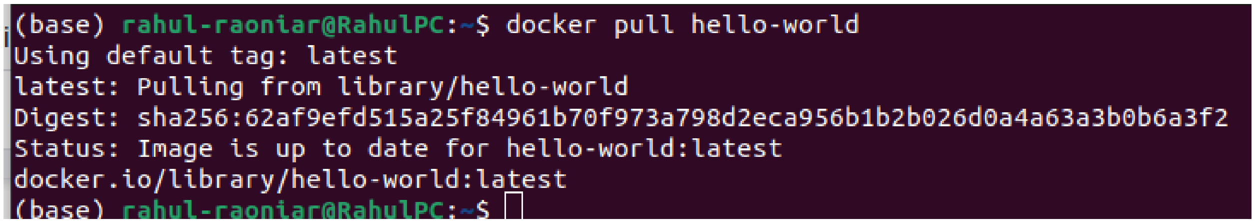
Removing a container

$ rocker rm container_name



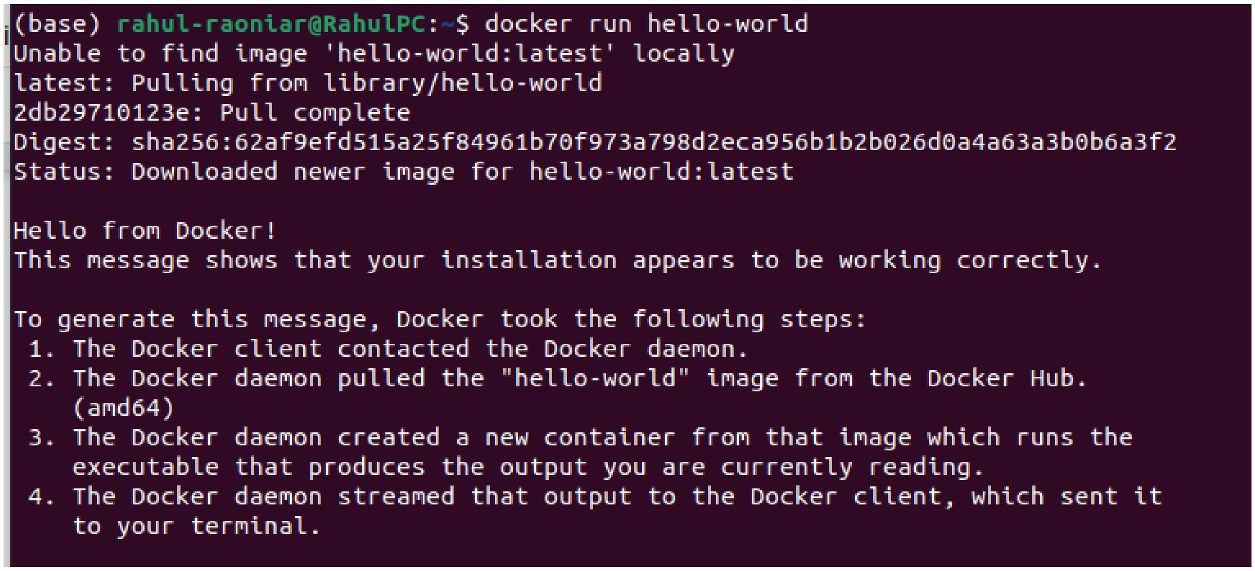
```
(base) rahul-raoniar@RahulPC:~$ docker ps -a
CONTAINER ID   IMAGE                     COMMAND                  CREATED          STATUS                      PORTS     NAMES
ac9a77f09b9f   churn-prediction:latest   "gunicorn --bind 0.0…"   26 hours ago     Exited (0) 26 hours ago               relaxed_pascal
ba69825c6080   churn-prediction:latest   "gunicorn --bind 0.0…"   2 days ago       Exited (0) 2 days ago                 awesome_hypatia
(base) rahul-raoniar@RahulPC:~$ docker rm awesome_hypatia
awesome_hypatia
```

Docker pull image-name
$ docker pull hello-world



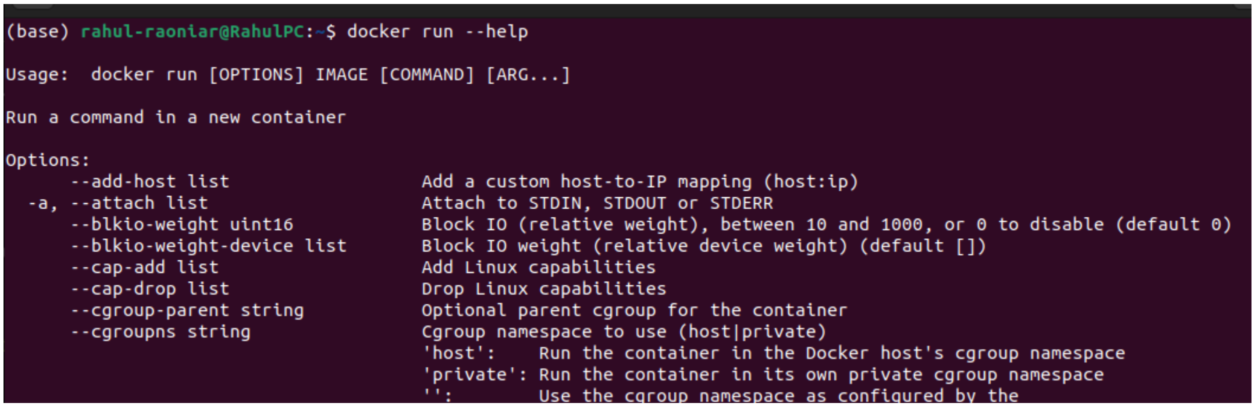
```
(base) rahul-raoniar@RahulPC:~$ docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
Digest: sha256:62af9efd515a25f84961b70f973a798d2eca956b1b2b026d0a4a63a3b0b6a3f2
Status: Image is up to date for hello-world:latest
docker.io/library/hello-world:latest
(base) rahul-raoniar@RahulPC:~$
```

Pulling and running an image
$ docker run hello-world



```
(base) rahul-raoniar@RahulPC:~$ docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:62af9efd515a25f84961b70f973a798d2eca956b1b2b026d0a4a63a3b0b6a3f2
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.
```

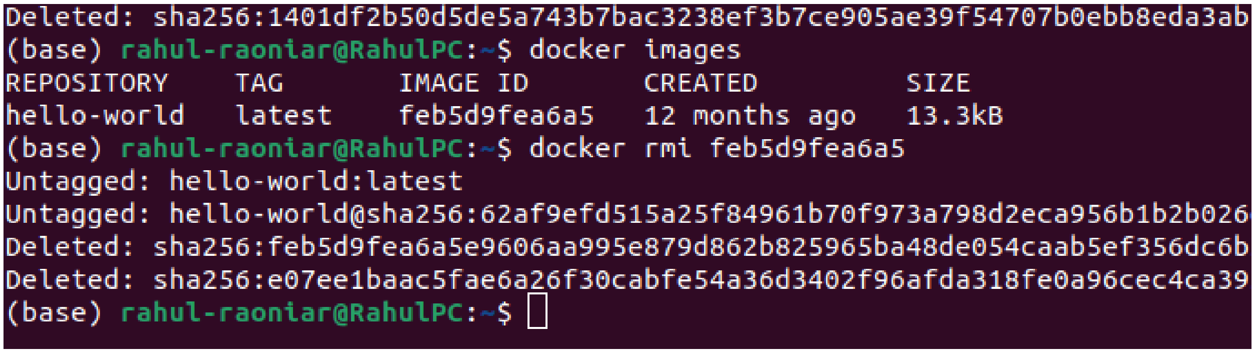
Docker help
$ docker run help



```
(base) rahul-raoniar@RahulPC:~$ docker run --help

Usage:  docker run [OPTIONS] IMAGE [COMMAND] [ARG...]

Run a command in a new container

Options:
      --add-host list                  Add a custom host-to-IP mapping (host:ip)
  -a, --attach list                    Attach to STDIN, STDOUT or STDERR
      --blkio-weight uint16            Block IO (relative weight), between 10 and 1000, or 0 to disable (default 0)
      --blkio-weight-device list       Block IO weight (relative device weight) (default [])
      --cap-add list                   Add Linux capabilities
      --cap-drop list                  Drop Linux capabilities
      --cgroup-parent string           Optional parent cgroup for the container
      --cgroupns string                Cgroup namespace to use (host|private)
                                       'host':    Run the container in the Docker host's cgroup namespace
                                       'private': Run the container in its own private cgroup namespace
                                       '':        Use the cgroup namespace as configured by the
```

Removing docker image

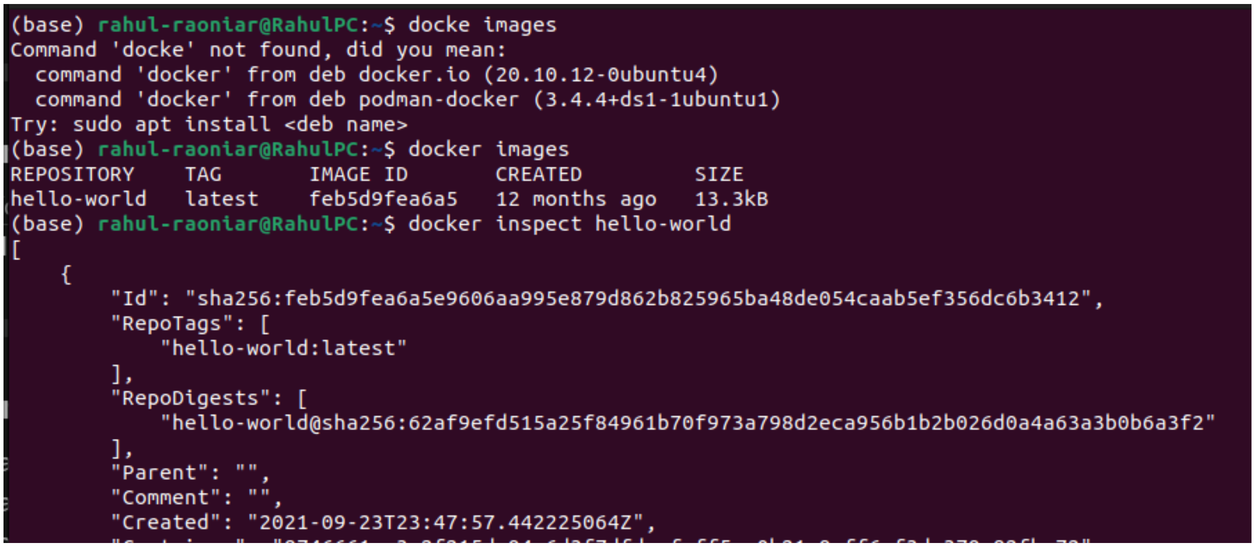
$ docker rmi image-name



```
Deleted: sha256:1401df2b50d5de5a743b7bac3238ef3b7ce905ae39f54707b0ebb8eda3ab
(base) rahul-raoniar@RahulPC:~$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED         SIZE
hello-world   latest    feb5d9fea6a5   12 months ago   13.3kB
(base) rahul-raoniar@RahulPC:~$ docker rmi feb5d9fea6a5
Untagged: hello-world:latest
Untagged: hello-world@sha256:62af9efd515a25f84961b70f973a798d2eca956b1b2b026
Deleted: sha256:feb5d9fea6a5e9606aa995e879d862b825965ba48de054caab5ef356dc6b
Deleted: sha256:e07ee1baac5fae6a26f30cabfe54a36d3402f96afda318fe0a96cec4ca39
(base) rahul-raoniar@RahulPC:~$ 
```

Inspecting a docker container

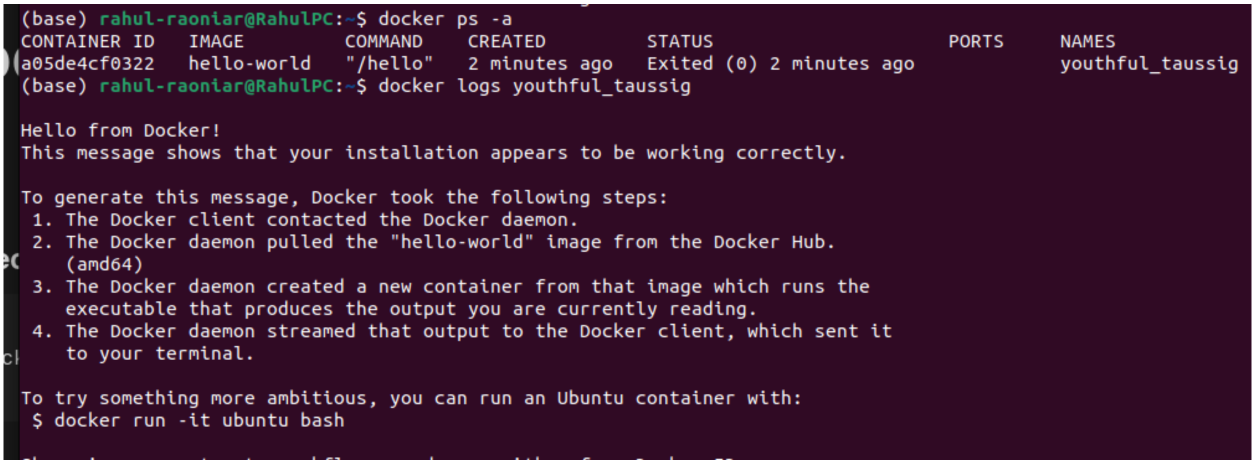
$ docker inspect hello-world



```
(base) rahul-raoniar@RahulPC:~$ docke images
Command 'docke' not found, did you mean:
  command 'docker' from deb docker.io (20.10.12-0ubuntu4)
  command 'docker' from deb podman-docker (3.4.4+ds1-1ubuntu1)
Try: sudo apt install <deb name>
(base) rahul-raoniar@RahulPC:~$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED         SIZE
hello-world   latest    feb5d9fea6a5   12 months ago   13.3kB
(base) rahul-raoniar@RahulPC:~$ docker inspect hello-world
[
    {
        "Id": "sha256:feb5d9fea6a5e9606aa995e879d862b825965ba48de054caab5ef356dc6b3412",
        "RepoTags": [
            "hello-world:latest"
        ],
        "RepoDigests": [
            "hello-world@sha256:62af9efd515a25f84961b70f973a798d2eca956b1b2b026d0a4a63a3b0b6a3f2"
        ],
        "Parent": "",
        "Comment": "",
        "Created": "2021-09-23T23:47:57.442225064Z",
```

Docker container logs

$ docker logs container-name



```
(base) rahul-raoniar@RahulPC:~$ docker ps -a
CONTAINER ID   IMAGE         COMMAND    CREATED         STATUS                     PORTS     NAMES
a05de4cf0322   hello-world   "/hello"   2 minutes ago   Exited (0) 2 minutes ago             youthful_taussig
(base) rahul-raoniar@RahulPC:~$ docker logs youthful_taussig

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
```

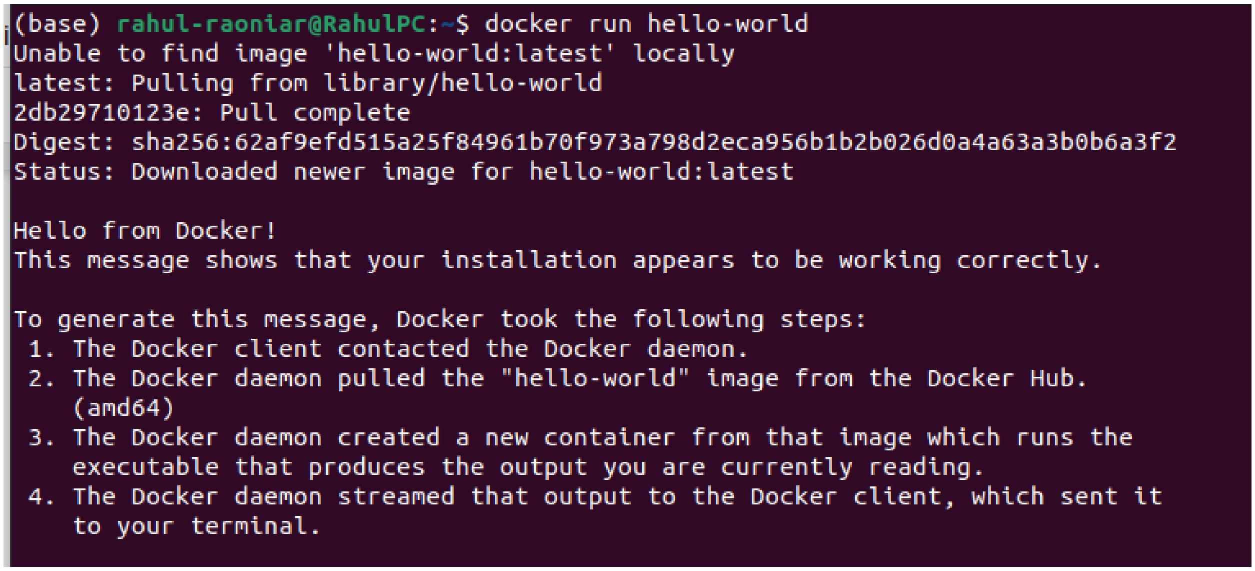
Rest commands are shown in action in assignments 2-4

Assignment 2

Tasks:

1. Hello World Docker Image
2. Run Hello World Docker Image Locally.

Pulling and running an image
$ docker run hello-world



```
(base) rahul-raoniar@RahulPC:~$ docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:62af9efd515a25f84961b70f973a798d2eca956b1b2b026d0a4a63a3b0b6a3f2
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.
```

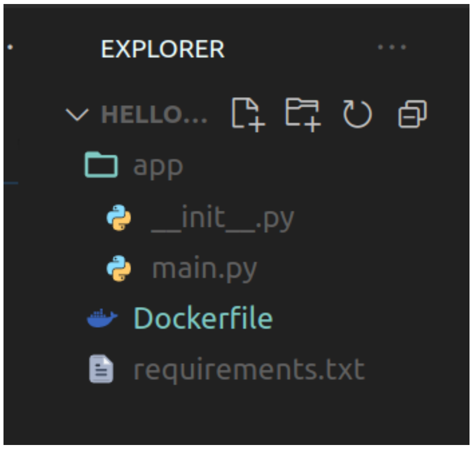
Assignment 3

Tasks:

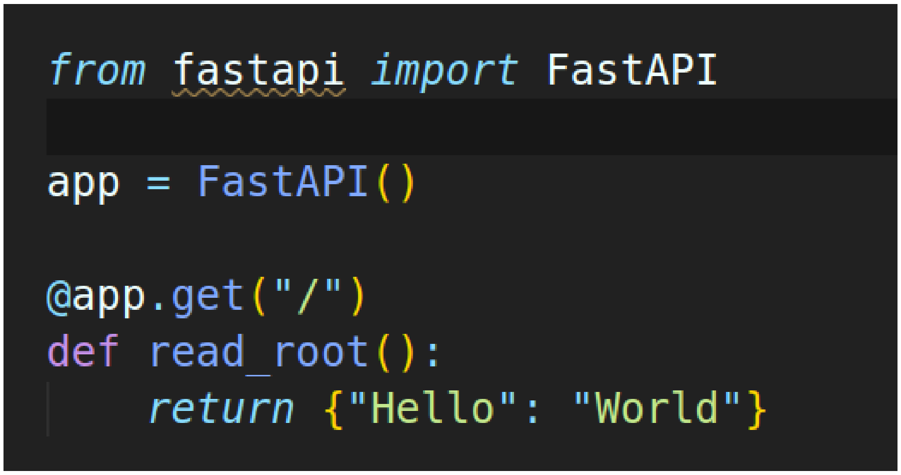
1. Create a hello world fastapi application.
2. Create a Dockerfile for your fastapi hello world application.
3. Build Docker image using Docker file.
4. Run the docker image build in the previous step.
5. Push your Docker image to Docker Hub.

Created a fastapi hello-world docker image

App configuration

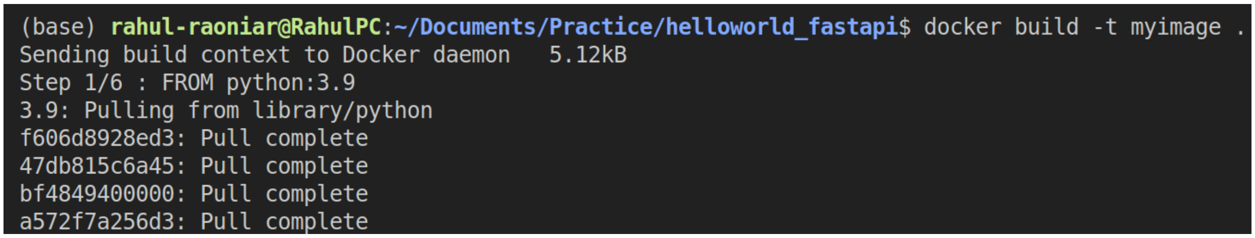


Fastapi main.py file



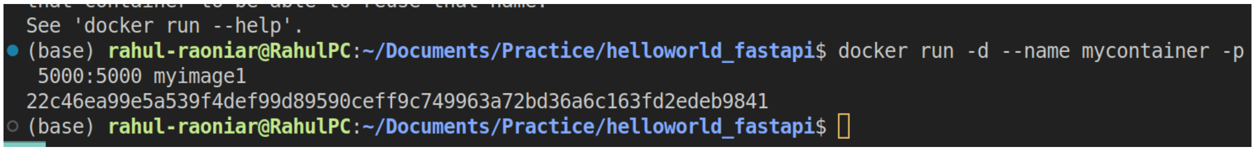
```
from fastapi import FastAPI

app = FastAPI()

@app.get("/")
def read_root():
    return {"Hello": "World"}
```

Created a docker image



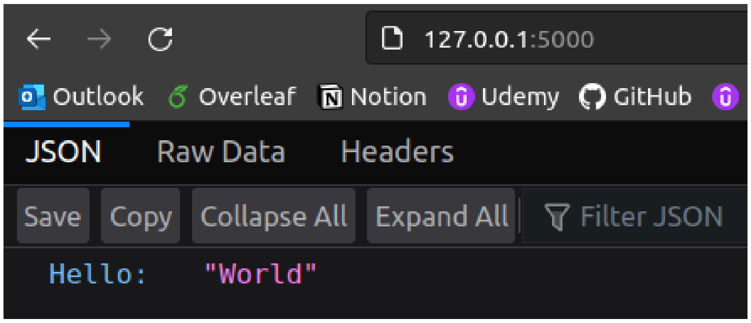
```
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ docker build -t myimage .
Sending build context to Docker daemon   5.12kB
Step 1/6 : FROM python:3.9
3.9: Pulling from library/python
f606d8928ed3: Pull complete
47db815c6a45: Pull complete
bf4849400000: Pull complete
a572f7a256d3: Pull complete
```

Run the container at port 5000



```
 that container to be able to reuse that name.
 See 'docker run --help'.
● (base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ docker run -d --name mycontainer -p
  5000:5000 myimage1
 22c46ea99e5a539f4def99d89590ceff9c749963a72bd36a6c163fd2edeb9841
○ (base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ 
```

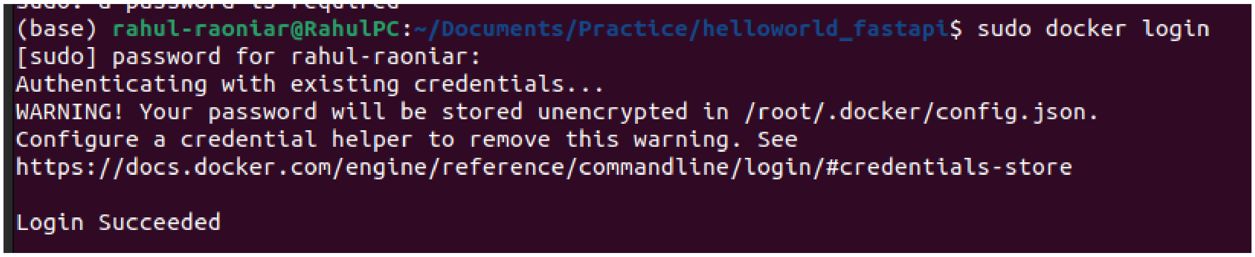
Output on GET request



```
Hello:   "World"
```

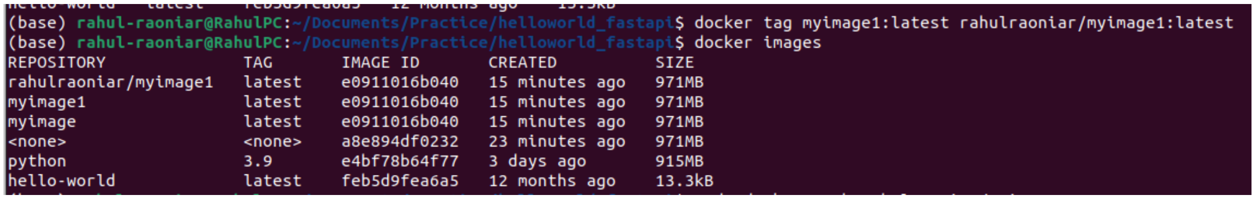
Pushing docker image to docker hub

Login to the docker hub



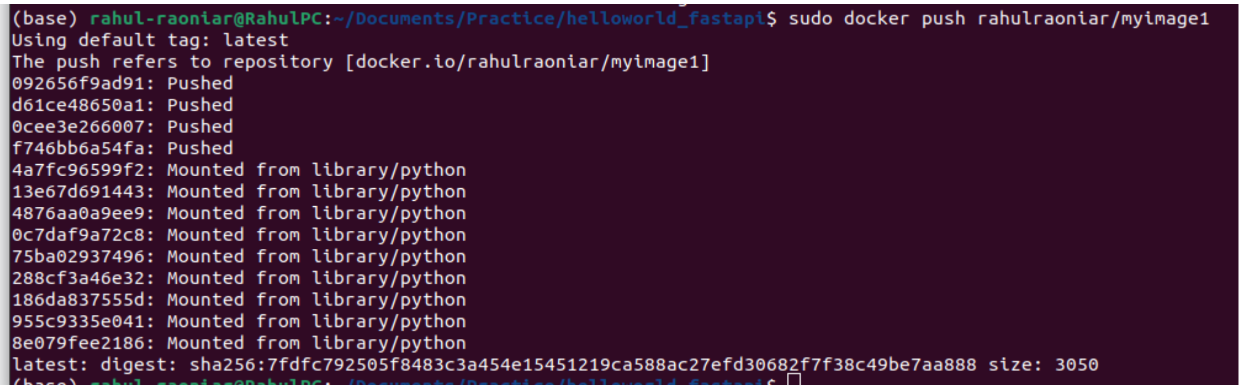
```
sudo: a password is required
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ sudo docker login
[sudo] password for rahul-raoniar:
Authenticating with existing credentials...
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

Tagging the image



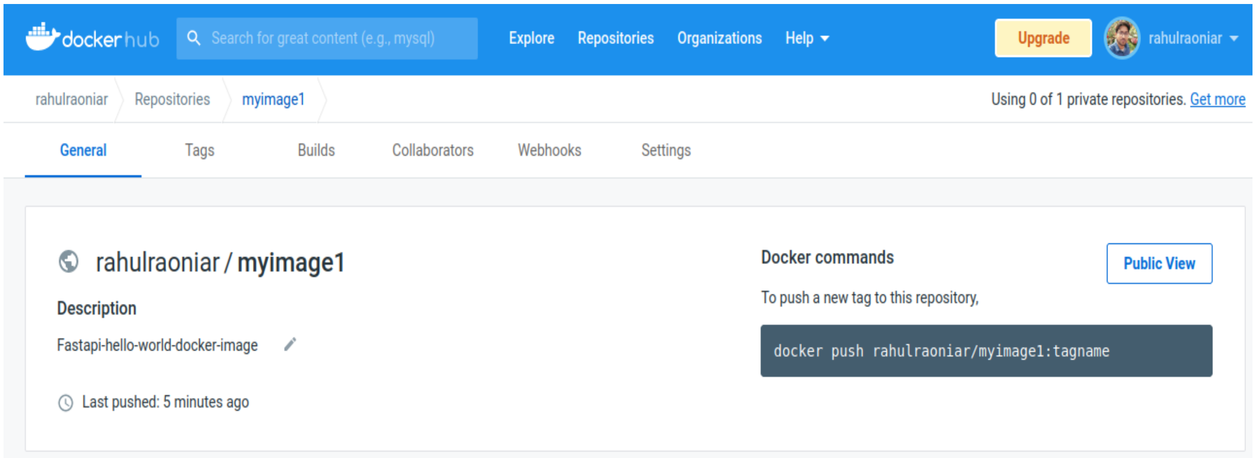
```
hello-world         latest    feb5d9fea6a5   12 months ago   13.3kB
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ docker tag myimage1:latest rahulraoniar/myimage1:latest
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ docker images
REPOSITORY              TAG       IMAGE ID       CREATED          SIZE
rahulraoniar/myimage1   latest    e0911016b040   15 minutes ago   971MB
myimage1                latest    e0911016b040   15 minutes ago   971MB
myimage                 latest    e0911016b040   15 minutes ago   971MB
<none>                  <none>    a8e894df0232   23 minutes ago   971MB
python                  3.9       e4bf78b64f77   3 days ago       915MB
hello-world             latest    feb5d9fea6a5   12 months ago    13.3kB
```

Pushing to docker hub



```
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ sudo docker push rahulraoniar/myimage1
Using default tag: latest
The push refers to repository [docker.io/rahulraoniar/myimage1]
092656f9ad91: Pushed
d61ce48650a1: Pushed
0cee3e266007: Pushed
f746bb6a54fa: Pushed
4a7fc96599f2: Mounted from library/python
13e67d691443: Mounted from library/python
4876aa0a9ee9: Mounted from library/python
0c7daf9a72c8: Mounted from library/python
75ba02937496: Mounted from library/python
288cf3a46e32: Mounted from library/python
186da837555d: Mounted from library/python
955c9335e041: Mounted from library/python
8e079fee2186: Mounted from library/python
latest: digest: sha256:7fdfc792505f8483c3a454e15451219ca588ac27efd30682f7f38c49be7aa888 size: 3050
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$
```

Varified upload to dockerhub website



Using 0 of 1 private repositories. Get more

rahulraoniar / myimage1

Description

Fastapi-hello-world-docker-image

Last pushed: 5 minutes ago

Docker commands

To push a new tag to this repository,

```
docker push rahulraoniar/myimage1:tagname
```

Assignment 4

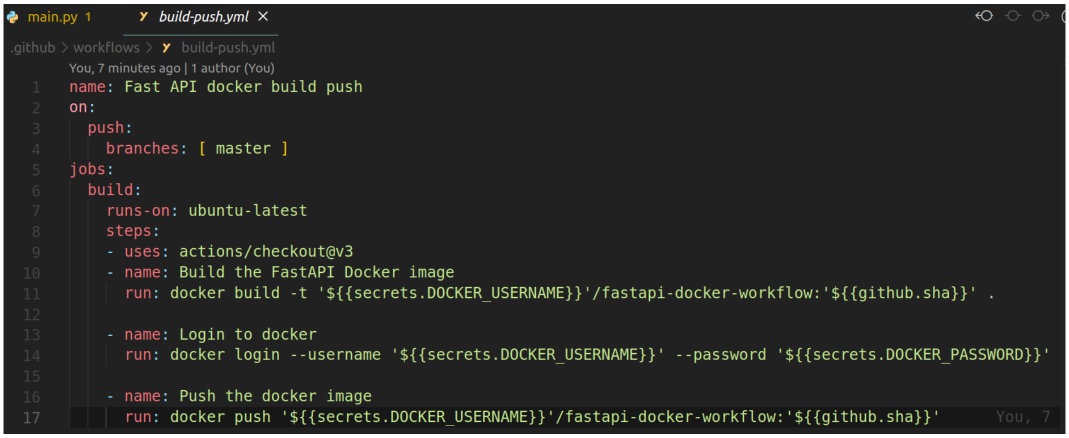
Tasks:

Automate Assignment below task using github action.

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

GitHub Repo: https://github.com/rahul-raoniar/helloworld_fastapi

Created a github action build-push.yml file

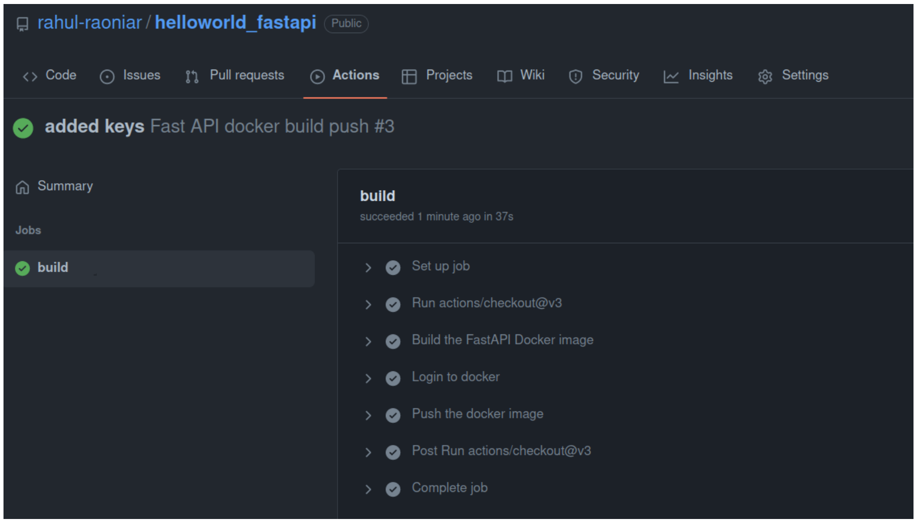


main.py 1
build-push.yml
.github > workflows > build-push.yml
You, 7 minutes ago | 1 author (You)
You, 7

```yaml
name: Fast API docker build push
on:
  push:
    branches: [ master ]
jobs:
  build:
    runs-on: ubuntu-latest
    steps:
    - uses: actions/checkout@v3
    - name: Build the FastAPI Docker image
      run: docker build -t '${{secrets.DOCKER_USERNAME}}'/fastapi-docker-workflow:'${{github.sha}}' .

    - name: Login to docker
      run: docker login --username '${{secrets.DOCKER_USERNAME}}' --password '${{secrets.DOCKER_PASSWORD}}'

    - name: Push the docker image
      run: docker push '${{secrets.DOCKER_USERNAME}}'/fastapi-docker-workflow:'${{github.sha}}'
```

Automate the workflow

- Pushed the files into the repo
- Added GitHub secrets.
- Build the workflow successfully
- Automated the dockerhub push using GitHub actions and secrets



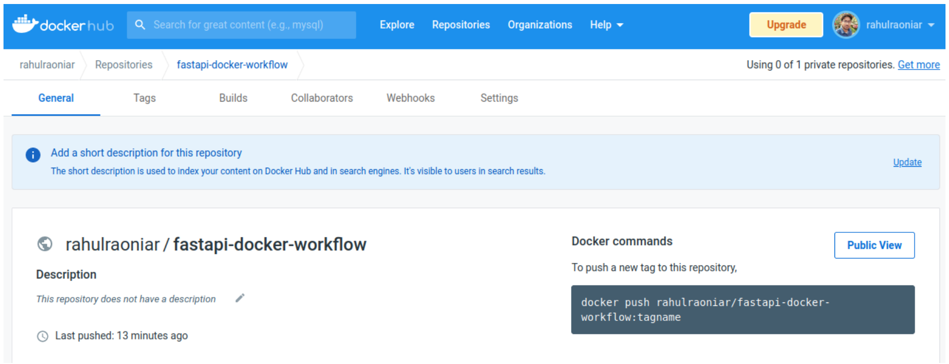
added keys Fast API docker build push #3

build

succeeded 1 minute ago in 37s

- Set up job
- Run actions/checkout@v3
- Build the FastAPI Docker image
- Login to docker
- Push the docker image
- Post Run actions/checkout@v3
- Complete job

Varified upload to dockerhub website



Using 0 of 1 private repositories. Get more

Add a short description for this repository

The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.

rahulraoniar / **fastapi-docker-workflow**

Description

This repository does not have a description

Last pushed: 13 minutes ago

Docker commands

To push a new tag to this repository,

```
docker push rahulraoniar/fastapi-docker-
workflow:tagname
```