

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

Show live containers (running)

\$ docker ps

```
(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

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

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
  --cgroupsns 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",
    "Container": "05156644-2-858151-01-61b57151-6-555-01-0-555-601-030-0051-70"
```

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.
```

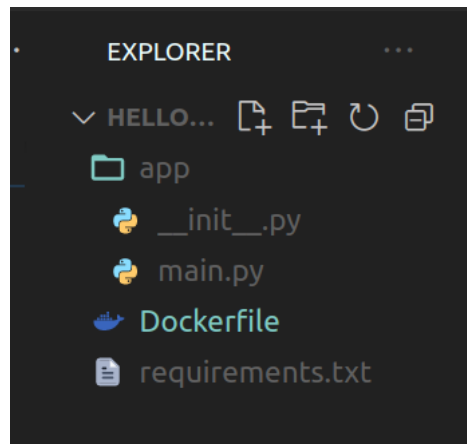
Assignment 3

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"}
```

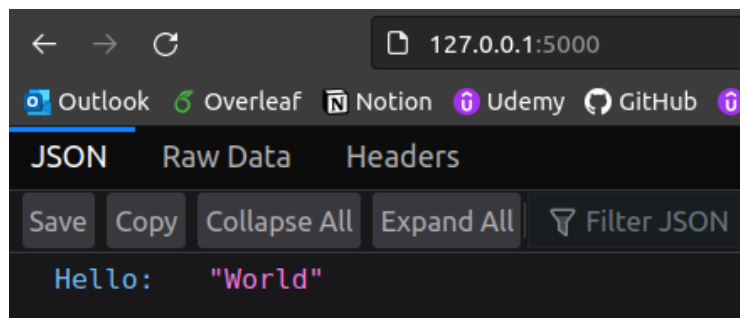
Created a docker image

```
(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

```
(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



Pushing docker image to docker hub

Login to the docker hub

```
(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

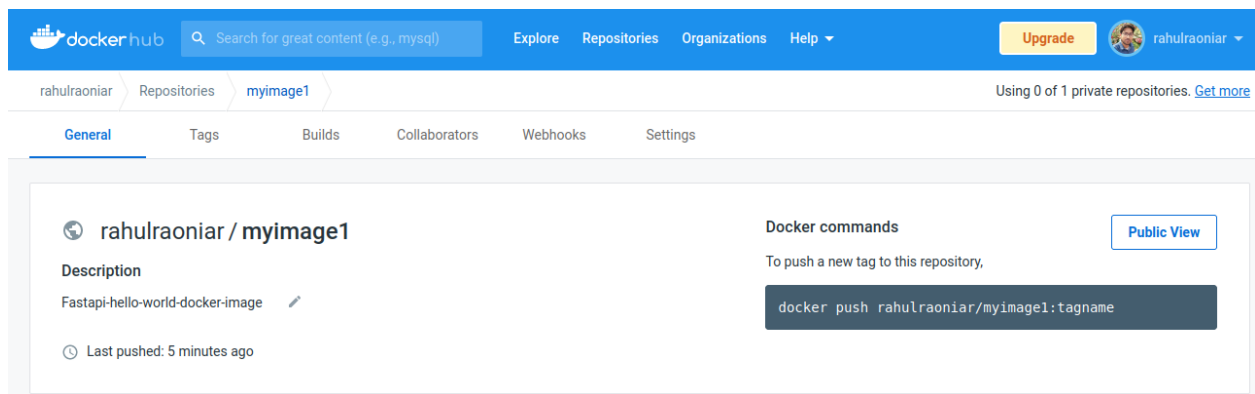
```
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ docker tag myimage1:latest rahulraoniar/myimage1:latest
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$ docker images
```

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: sha256:7fdcf792505f8483c3a454e15451219ca588ac27efd30682f7f38c49be7aa888 size: 3050
(base) rahul-raoniar@RahulPC:~/Documents/Practice/helloworld_fastapi$
```

Verified upload to dockerhub website



The screenshot shows the Docker Hub interface for the repository `rahulraoniar/myimage1`. The page has a blue header with the Docker Hub logo, a search bar, and navigation links for Explore, Repositories, Organizations, and Help. The user profile `rahulraoniar` is visible in the top right corner. Below the header, the repository name `rahulraoniar` is followed by `Repositories` and `myimage1`. A tab bar shows `General` as the active tab, with other tabs for `Tags`, `Builds`, `Collaborators`, `Webhooks`, and `Settings`. The main content area displays the repository name with a globe icon, a description "Fastapi-hello-world-docker-image" with an edit icon, and a timestamp "Last pushed: 5 minutes ago". On the right, there is a section for "Docker commands" with a "Public View" button and a code block containing the command `docker push rahulraoniar/myimage1:tagname`.