

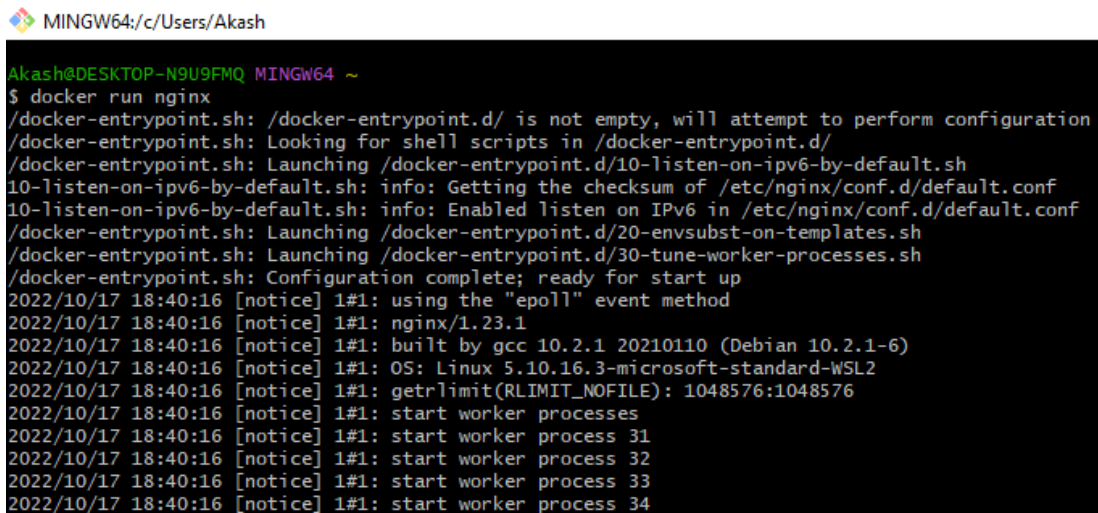
Docker & Docker Hub

Assignment 1:

Demonstrate minimum 15 basic docker command with explanation and screenshot.

1. Start the container

- **docker run nginx**

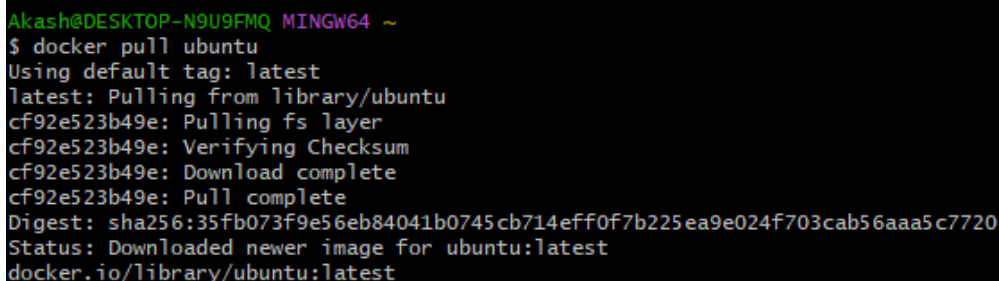


```
MINGW64:/c/Users/Akash
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker run nginx
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2022/10/17 18:40:16 [notice] 1#1: using the "epoll" event method
2022/10/17 18:40:16 [notice] 1#1: nginx/1.23.1
2022/10/17 18:40:16 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2022/10/17 18:40:16 [notice] 1#1: OS: Linux 5.10.16.3-microsoft-standard-WSL2
2022/10/17 18:40:16 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/10/17 18:40:16 [notice] 1#1: start worker processes
2022/10/17 18:40:16 [notice] 1#1: start worker process 31
2022/10/17 18:40:16 [notice] 1#1: start worker process 32
2022/10/17 18:40:16 [notice] 1#1: start worker process 33
2022/10/17 18:40:16 [notice] 1#1: start worker process 34
```

If the image is not available locally it will try to pull image from docker hub repository and then running it

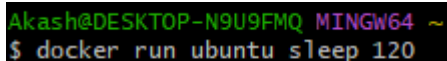
2. Only pull and do not start the container

- **docker pull ubuntu**



```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
cf92e523b49e: Pulling fs layer
cf92e523b49e: Verifying Checksum
cf92e523b49e: Download complete
cf92e523b49e: Pull complete
Digest: sha256:35fb073f9e56eb84041b0745cb714eff0f7b225ea9e024f703cab56aaa5c7720
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

- **docker run ubuntu sleep 120**



```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker run ubuntu sleep 120
```

Container will sleep after 120 seconds

3. Listing the containers running

- **docker ps**

```
MINGW64:/c:/Users/Akash
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS        NAMES
99e32b555b4f   nginx    "/docker-entrypoint...." 3 minutes ago Up 3 minutes  80/tcp       quirky_khorana
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ |
```

4. Listing the running as well as stopped containers

- **docker ps -a**

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS        NAMES
99e32b555b4f   nginx    "/docker-entrypoint...." 3 minutes ago Up 3 minutes  80/tcp       quirky_khorana
7857495b03bf   nginx    "/docker-entrypoint...." 5 minutes ago Exited (0) 4 minutes ago          nifty_goldstine
f4a8ef223f5e   first-docker-app  "python app.py"         4 days ago   Exited (255) 9 minutes ago          confident_germain
5c81e543d914   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          priceless_mirzakhani
7b03bb0ae506   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          trusting_antonelli
a1c534ce0202   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          strange_mclaren
ed77a4a563a2   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          kind_curie
9c94bd24c27c   docker101tutorial  "/docker-entrypoint...." 4 days ago   Exited (0) 4 days ago          docker-tutorial
5a2321a0b6cf   alpine/git      "git clone https://g..." 4 days ago   Exited (0) 4 days ago          repo
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ |
```

5. Stopping a running container

- **docker stop quirky_khorana**

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker stop quirky_khorana
quirky_khorana
```

6. deleting the container.

It is very essential that a container must be stopped before removing.

- **docker rm quirky_khorana**

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker rm quirky_khorana
quirky_khorana
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS        NAMES
7857495b03bf   nginx    "/docker-entrypoint...." 12 minutes ago Exited (0) 11 minutes ago          nifty_goldstine
f4a8ef223f5e   first-docker-app  "python app.py"         4 days ago   Exited (255) 16 minutes ago          confident_germain
5c81e543d914   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          priceless_mirzakhani
7b03bb0ae506   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          trusting_antonelli
a1c534ce0202   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          strange_mclaren
ed77a4a563a2   919d6d803bad  "python app.py"         4 days ago   Exited (0) 4 days ago          kind_curie
9c94bd24c27c   docker101tutorial  "/docker-entrypoint...." 4 days ago   Exited (0) 4 days ago          docker-tutorial
5a2321a0b6cf   alpine/git      "git clone https://g..." 4 days ago   Exited (0) 4 days ago          repo
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$
```

7. check docker images

- docker images

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker images
REPOSITORY              TAG          IMAGE ID          CREATED          SIZE
aakashsoni/first-docker-app latest       6f07b6dcd25a     4 days ago      1.32GB
first-docker-app        latest       6f07b6dcd25a     4 days ago      1.32GB
docker101tutorial       latest       7e90f0a63bcb     4 days ago      28.9MB
alpine/git               latest       b80d2cac43e4     10 days ago     43.6MB
nginx                    latest       51086ed63d8c     12 days ago     142MB

Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ |
```

8. Deleting docker image

- docker rmi nginx

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker rm nifty_goldstine
nifty_goldstine

Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker rmi nginx
Untagged: nginx:latest
Untagged: nginx@sha256:2f770d2fe27bc85f68fd7fe6a63900ef7076bc703022fe81b980377fe3d27b70
Deleted: sha256:51086ed63d8c8ba3a6a3d94ecd103e9638b4cb8533bb896caf2cda04fb79b862f
Deleted: sha256:c22f011a5c63a718e3155ef21b930f5583102384c8e333299913ed660baa230c
Deleted: sha256:1235ee8acd48a34c389280d8192ae79ef241d546eeea2f3416b64608d68d8538
Deleted: sha256:80ab7667b1007f2ed4b5387e7585e18d3ca1899c76449240e2890373a8e77285
Deleted: sha256:4833b18722fc3d06feafaa0f61726b1b11baa1daa0ea455e6e2ab66a7c8db283
Deleted: sha256:98b8d2ed046082a8f6c2fb2f34430f5142fea7a7078326d980b323d71640d8ff
Deleted: sha256:fe7b1e9bf7922fbc22281bcc6b4f5ac8f1a7b4278929880940978c42fc9d0229
```

It is very important to remove all the container references to an image before deleting the image. Check link

<https://stackoverflow.com/questions/33907835/docker-error-cannot-delete-docker-container-conflict-unable-to-remove-reposito>

9. Docker run

Get only specific image based on tag from docker hub

- docker run alpine:3.12.8

```
MINGW64:/c:/Users/Akash

Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker run alpine:3.12.8
Unable to find image 'alpine:3.12.8' locally
3.12.8: Pulling from library/alpine
e519532ddf75: Pulling fs layer
e519532ddf75: Verifying Checksum
e519532ddf75: Download complete
e519532ddf75: Pull complete
Digest: sha256:a296b4c6f6ee2b88f095b61e95c7ef4f51ba25598835b4978c9256d8c8ace48a
Status: Downloaded newer image for alpine:3.12.8
```

Get only specific image based on tag from docker hub

```
run docker image COMMAND --help for more information on a command.

Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker images
REPOSITORY              TAG          IMAGE ID       CREATED        SIZE
aakashsoni/first-docker-app latest       6f07b6dcd25a   4 days ago    1.32GB
first-docker-app         latest       6f07b6dcd25a   4 days ago    1.32GB
docker101tutorial        latest       7e90f0a63bcb   4 days ago    28.9MB
alpine/git               latest       b80d2cac43e4   10 days ago   43.6MB
ubuntu                   latest       216c552ea5ba   12 days ago   77.8MB
alpine                   3.12.8      48b8ec4ed9eb   13 months ago 5.58MB
```

10. Port mapping

Lets try to run some previous made application whose image we have created

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker run aakashsoni/first-docker-app
* Serving Flask app 'app'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5000
* Running on http://172.17.0.2:5000
Press CTRL+C to quit
```

This IP : 172.17.0.2:5000 is only accessible inside the container and if we directly run it using browser it will throw an time out error

So now we will map it to other port

- `docker run -p 8000:5000 aakashsoni/first-docker-app`



So using mapping we can run multiple instances at the same time

11. inspect

Get full information about the containers

- `docker inspect <container name>`

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~
$ docker inspect sharp_ritchie
[
  {
    "Id": "2487129024c5bc86cdf665dcb12087a021da2a7e58776f74516c880064537b9",
    "Created": "2022-10-17T19:42:05.5538973Z",
    "Path": "python",
    "Args": [
      "app.py"
    ],
    "State": {
      "Status": "running",
      "Running": true,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 2172,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2022-10-17T19:42:06.3289745Z",
      "FinishedAt": "0001-01-01T00:00:00Z"
    },
    "Image": "sha256:6f07b6dcd25a13749c91d508ff8b04840f3e0d0d67a71aed96895a03e241160",
    "ResolveConfPath": "/var/lib/docker/containers/2487129024c5bc86cdf665dcb12087a021da2a7e58776f74516c880064537b9/resolve.conf",
    "HostnamePath": "/var/lib/docker/containers/2487129024c5bc86cdf665dcb12087a021da2a7e58776f74516c880064537b9/hostname",
    "HostsPath": "/var/lib/docker/containers/2487129024c5bc86cdf665dcb12087a021da2a7e58776f74516c880064537b9/hosts",
    "LogPath": "/var/lib/docker/containers/2487129024c5bc86cdf665dcb12087a021da2a7e58776f74516c880064537b9/2487129024c5bc86cdf665dcb12087a021da2a7e58776f74516c880064537b9-json.log",
    "Name": "/sharp_ritchie",
    "RestartCount": 0,
    "Driver": "overlay2",
    "Platform": "linux",
    "MountLabel": "",
    "ProcessLabel": "",
    "AppArmorProfile": "",
    "ExecIDs": null,
    "NetworkSettings": {
      "Bridge": "",
      "SandboxID": "",
      "HairpinMode": false,
      "LinkLocalIPv6Address": "",
      "LinkLocalIPv6Prefix": "",
      "MacAddress": "",
      "NetworkInterface": "",
      "PortMap": {},
      "Ports": {}
    }
  }
]
```

12. Running application directly into a container on ubuntu OS by installing all the docker layers

- Running ubuntu OS image container

```
winpty docker run -p 8000:5000 -it ubuntu bash
```

- Update linux container machine

```
root@86516fb571f1:/# apt-get update
```

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$ winpty docker run -p 8000:5000 -it ubuntu bash
root@86516fb571f1:/# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu jammy InRelease [270 kB]
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [114 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [469 kB]
Ign:6 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages
Get:7 http://archive.ubuntu.com/ubuntu jammy/restricted amd64 Packages [164 kB]
Ign:8 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages
Get:9 http://archive.ubuntu.com/ubuntu jammy/main amd64 Packages [1792 kB]
Get:10 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [363 kB]
Get:11 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [4644 B]
Get:12 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [438 kB]
Ign:13 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages
Get:14 http://archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [8056 B]
Get:15 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [804 kB]
Get:16 http://archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [483 kB]
Get:17 http://archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [3175 B]
Get:18 http://archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [7271 B]
Get:6 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [17.5 MB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [266 kB]
Get:13 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [544 kB]
Fetched 23.4 MB in 27s (853 kB/s)
Reading package lists... Done
```

- Install python layer

```
root@86516fb571f1:/# apt-get install python3
```

```
root@86516fb571f1:/# pip install python3
bash: pip: command not found
root@86516fb571f1:/# apt-get install python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libexpat1 libmpdec3 libpython3-stdlib libpython3.10-minimal libpython3.10-stdlib libreadline8 libsqlite3-0 media-type
Suggested packages:
  python3-doc python3-tk python3-venv python3.10-venv python3.10-doc binutils binfmt-support readline-doc
The following NEW packages will be installed:
  libexpat1 libmpdec3 libpython3-stdlib libpython3.10-minimal libpython3.10-stdlib libreadline8 libsqlite3-0 media-type
0 upgraded, 13 newly installed, 0 to remove and 1 not upgraded.
Need to get 6499 kB of archives.
After this operation, 23.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libpython3.10-minimal amd64 3.10.6-1~22.04 [810 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 libexpat1 amd64 2.4.7-1 [90.7 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3.10-minimal amd64 3.10.6-1~22.04 [2254 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-minimal amd64 3.10.6-1~22.04 [24.3 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy/main amd64 media-types all 7.0.0 [25.5 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy/main amd64 libmpdec3 amd64 2.5.1-2build2 [86.8 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy/main amd64 readline-common all 8.1.2-1 [53.5 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/main amd64 libreadline8 amd64 8.1.2-1 [153 kB]
Get:9 http://archive.ubuntu.com/ubuntu jammy/main amd64 libsqlite3-0 amd64 3.37.2-2 [643 kB]
Get:10 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libpython3.10-stdlib amd64 3.10.6-1~22.04 [1832 kB]
```

- Install requirements in the container

```
root@86516fb571f1:/# pip install flask
root@86516fb571f1:/# cd /opt/
root@86516fb571f1:/opt# apt-get install vim
root@86516fb571f1:/opt# apt install curl
```

```
root@86516fb571f1:/# cd /opt/
root@86516fb571f1:/opt# apt-get install vim
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```

- Lets try to create a file app.py inside the container and run it

```
root@86516fb571f1:/opt# vi app.py
root@86516fb571f1:/opt# python3 app.py
```

```
root@86516fb571f1:/opt# python3 app.py
* Serving Flask app 'app'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
```

- Got to the terminal in docker

```
curl --location -request GET 'http://127.0.0.1:5000'
```

```
docker exec -it 86516fb571f1caacb379a8a916946d143c0e4260aafdd9eebe2db5fdc3ba7acb /bin/sh
```

```
# curl --location --request GET 'http://127.0.0.1:5000/'
curl: (3) Failed to convert --request to ACE; could not convert string to UTF-8
curl: (6) Could not resolve host: GET
My First Image!# curl --location --request GET 'http://127.0.0.1:5000/container'
Container Working Successfully#
```

Container working successful means our application is working fine.

We have simply done a trial just in order to observe that every thing is running fine

Simply run "**History**" command to get and the commands which we ran recently and using these we will create a docker file for our calculator app.

```
^Croot@86516fb571f1:/opt# history
 1 apt-get update
 2 pip install python3
 3 apt-get install python3
 4 pip install flask
 5 pip3 install flask
 6 sudo apt-get install python3
 7 apt-get install -y python3
 8 pip3 install flask
 9 apt-get install -y python3-pip
10 pip3 install flask
11 cd /opt/
12 apt-get install vim
13 vi
14 vi app.py
15 python3 app.py
16 vi app.py
17 python3 app.py
18 apt install curl
19 python3 app.py
20 history
root@86516fb571f1:/opt#
```


Assignment 2:

Building a Local docker image

13. Now we will create a docker file in our app and will use the commands which are required for creating docker image

```
Dockerfile > ...
1 FROM ubuntu
2
3
4 RUN apt-get update
5 RUN apt-get install -y python3 python3-pip
6 RUN pip3 install flask
7 RUN mkdir app
8
9 WORKDIR /opt/app
10 COPY . /opt/app
11
12 ENTRYPOINT FLASK_APP=/opt/app/app.py flask run --host 0.0.0.0
13
14
```

Now the final docker file is created

Lets build the local Image

```
- docker build . -t cal
```

This command will build a docker image by downloading all the libraries and run time dependencies

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$ docker build . -t cal
[+] Building 130.9s (12/12) FINISHED
=> [internal] load build definition from Dockerfile                                0.2s
=> => transferring dockerfile: 264B                                              0.1s
=> [internal] load .dockerignore                                                 0.1s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/ubuntu:latest                0.0s
=> [internal] load build context                                                3.1s
=> => transferring context: 8.32kB                                              2.6s
=> [1/7] FROM docker.io/library/ubuntu                                         0.1s
=> [2/7] RUN apt-get update                                                    19.7s
=> [3/7] RUN apt-get install -y python3 python3-pip                          99.3s
=> [4/7] RUN pip3 install flask                                                5.0s
=> [5/7] RUN mkdir app                                                         0.8s
=> [6/7] WORKDIR /opt/app                                                       0.1s
=> [7/7] COPY . /opt/app                                                       0.1s
=> exporting to image                                                         5.4s
=> => exporting layers                                                         5.4s
=> => writing image sha256:9f254bf7e4579281755d30cfa2830ad0d9884429c2efb6d13b695fcc090ddce 0.0s
=> => naming to docker.io/library/cal                                         0.0s
```

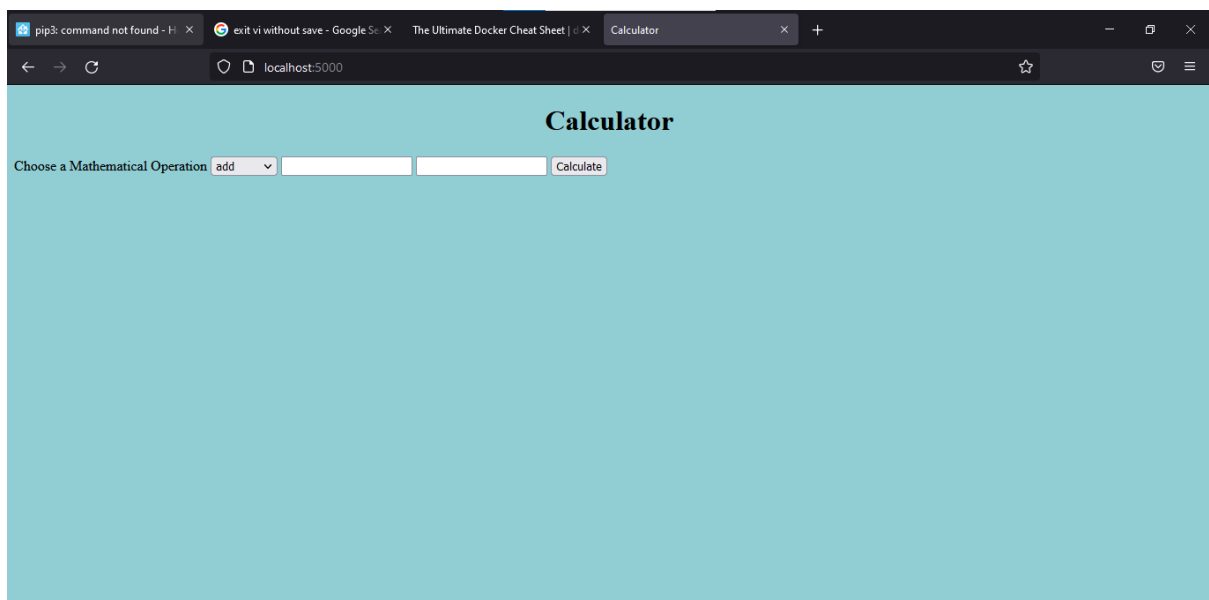
Now a docker image has been created with name "**cal**"


```
Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
cal	latest	3cddf541084a	10 seconds ago	468MB
<none>	<none>	9f254bf7e457	4 minutes ago	468MB
first-docker-app	latest	6f07b6dcd25a	4 days ago	1.32GB
aakashsoni/first-docker-app	latest	6f07b6dcd25a	4 days ago	1.32GB
docker101tutorial	latest	7e90f0a63bcb	5 days ago	28.9MB
alpine/git	latest	b80d2cac43e4	11 days ago	43.6MB
ubuntu	latest	216c552ea5ba	13 days ago	77.8MB
alpine	3.12.8	48b8ec4ed9eb	13 months ago	5.58MB

Let's Run the local image

- docker run -p 5000:5000 cal



So the image is running locally

Assignment 3:

Now lets create a image and push it on the docker hub

14. Initially We will do a Login to docker hub first

- docker login

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$ docker login
Authenticating with existing credentials...
Login Succeeded

Logging in with your password grants your terminal complete access to your account.
For better security, log in with a limited-privilege personal access token. Learn more at https://docs.docker.com/go/access-tokens/

Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$
```

15. Building the image and pushing it onto the docker Hub

- docker build . -t aakashsoni/calculatorapp

```
Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$ docker build . -t aakashsoni/calculatorapp
[+] Building 0.6s (12/12) FINISHED
=> [internal] load build definition from Dockerfile                                0.1s
=> => transferring dockerfile: 32B                                              0.0s
=> [internal] load .dockerignore                                                0.0s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/ubuntu:latest                0.0s
=> [1/7] FROM docker.io/library/ubuntu                                         0.0s
=> [internal] load build context                                              0.1s
=> => transferring context: 2.86kB                                             0.0s
=> CACHED [2/7] RUN apt-get update                                             0.0s
=> CACHED [3/7] RUN apt-get install -y python3 python3-pip                   0.0s
=> CACHED [4/7] RUN pip3 install flask                                         0.0s
=> CACHED [5/7] RUN mkdir app                                                  0.0s
```


- docker images


```
$ docker images
REPOSITORY          TAG          IMAGE ID          CREATED          SIZE
aakashsoni/calculatorapp  latest      280a8eddda70     About a minute ago  468MB
cal                  latest      a7709cd89fec     33 minutes ago   468MB
<none>              <none>      3cddf541084a     36 minutes ago   468MB
<none>              <none>      9f254bf7e457     40 minutes ago   468MB
aakashsoni/first-docker-app  latest      6f07b6dcd25a     4 days ago       1.32GB
first-docker-app      latest      6f07b6dcd25a     4 days ago       1.32GB
docker101tutorial     latest      7e90f0a63bcb     5 days ago       28.9MB
alpine/git            latest      b80d2cac43e4     11 days ago      43.6MB
ubuntu                latest      216c552ea5ba     13 days ago      77.8MB
alpine                3.12.8     48b8ec4ed9eb     13 months ago    5.58MB
```

Pushing image form local to docker hub


- `docker push aakashsoni/calculatorapp`


```
Akash@DESKTOP-N9U9FMQ MINGW64 ~/Documents/industry_ready_projects/2 dockers/my_calculator
$ docker push aakashsoni/calculatorapp
Using default tag: latest
The push refers to repository [docker.io/aakashsoni/calculatorapp]
895d855fecf0: Pushed
29ea141b8032: Pushed
c5494d5d4189: Pushed
fe22de897214: Pushed
26e654c38998: Pushed
5c42d08536ca: Pushed
17f623af01e2: Mounted from library/ubuntu
latest: digest: sha256:a5ede1c5e410e0e88ff21ab06be9916b70369e912d4ae501ebbe667e760e45c size: 1787
```

 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. [Update](#)

 **aakashsoni / calculatorapp**

Description


This repository does not have a description 

 Last pushed: a minute ago



Docker commands [Public View](#)

To push a new tag to this repository,

```
docker push aakashsoni/calculatorapp:tagname
```

Tags and scans  VULNERABILITY SCANNING - DISABLED [Enable](#)

This repository contains 1 tag(s).

Tag	OS	Pulled	Pushed
 latest		—	a minute ago

[See all](#) [Go to Advanced Image Management](#)

Automated Builds

Manually pushing images to Hub? Connect your account to GitHub or Bitbucket to automatically build and tag new images whenever your code is updated, so you can focus your time on creating.

Available with Pro, Team and Business subscriptions.

[Upgrade](#) [Learn more](#)

Now this repository is visible globally.

Assignment 4:

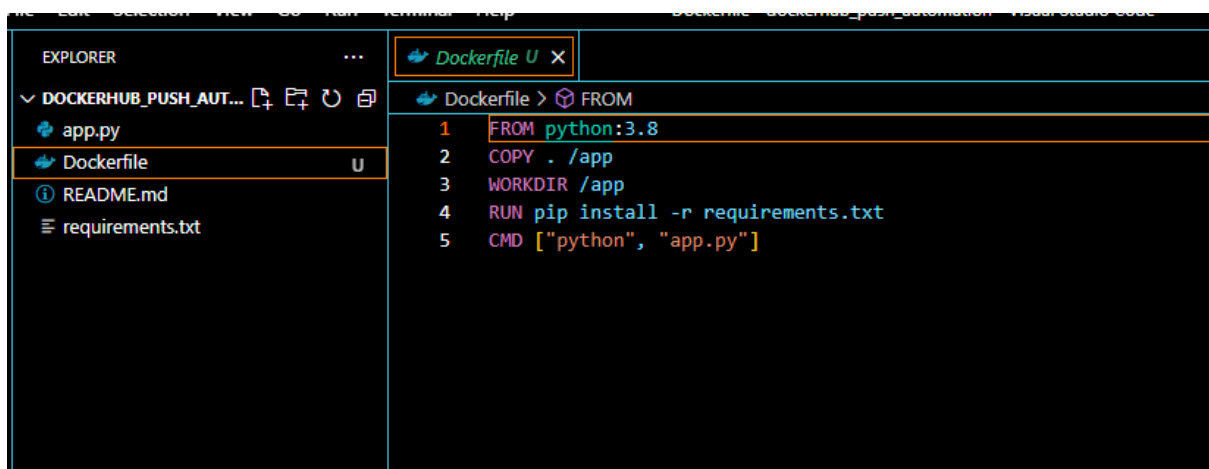
Automate Assignment below task using github action.

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

Step 1: Create a new repo on github https://github.com/akash-soni/dockerhub_push_automation.git

Step 2: Git clone and create a small "Hello world" application

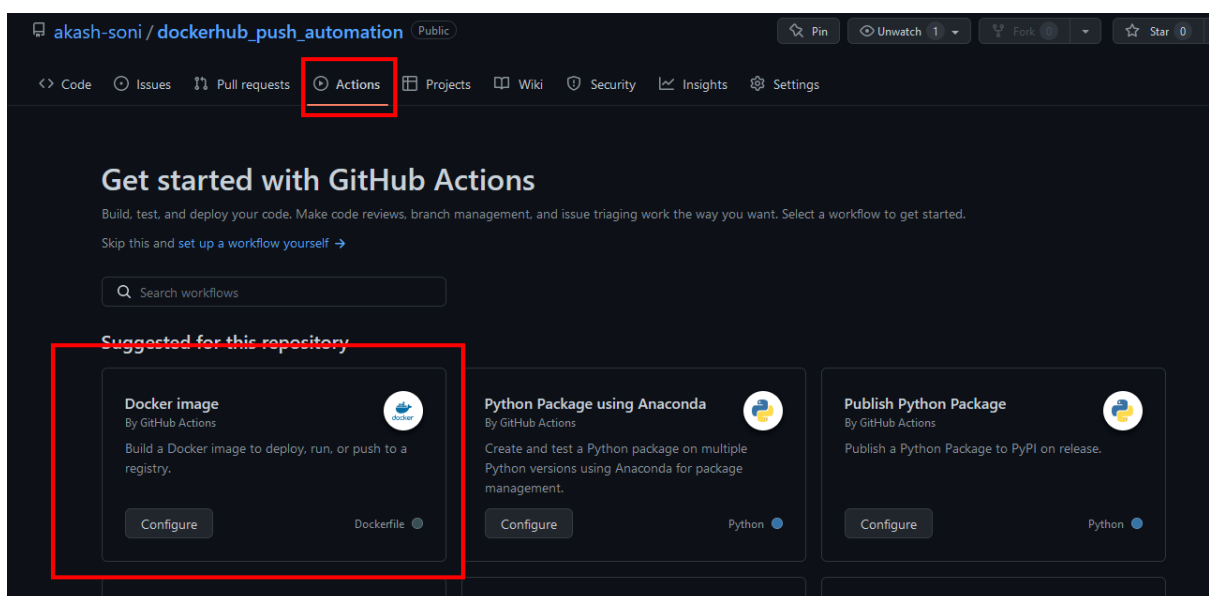
Step 3: Create a docker file

A screenshot of the Visual Studio Code editor. On the left, the Explorer sidebar shows a file tree for a repository named 'DOCKERHUB_PUSH_AUT...'. It contains files 'app.py', 'Dockerfile', 'README.md', and 'requirements.txt'. The 'Dockerfile' file is selected and highlighted. On the right, the Dockerfile content is displayed in a dark-themed editor. The code is as follows:

```
1 FROM python:3.8
2 COPY . /app
3 WORKDIR /app
4 RUN pip install -r requirements.txt
5 CMD ["python", "app.py"]
```

Step 4 : Now push all these changes onto Repository

Step 5 : Github Actions provide Docker Configuration



Step 6: Github already provides workflow template for pushing with a build command, here simply change give the name with which you want to push image on docker hub



```
1 name: Docker Image CI
2
3 on:
4   push:
5     branches: [ "main" ]
6   pull_request:
7     branches: [ "main" ]
8
9 jobs:
10
11   build:
12
13     runs-on: ubuntu-latest
14
15     steps:
16       - uses: actions/checkout@v3
17       - name: build the Docker image
18         run: docker build . --file Dockerfile --tag aakashsoni/dockerhub-push-automation
19
```

Observe that template only provides code to build the image but not to push the image.

Step 7: We manually write step to login into docker hub and push image into docker hub.

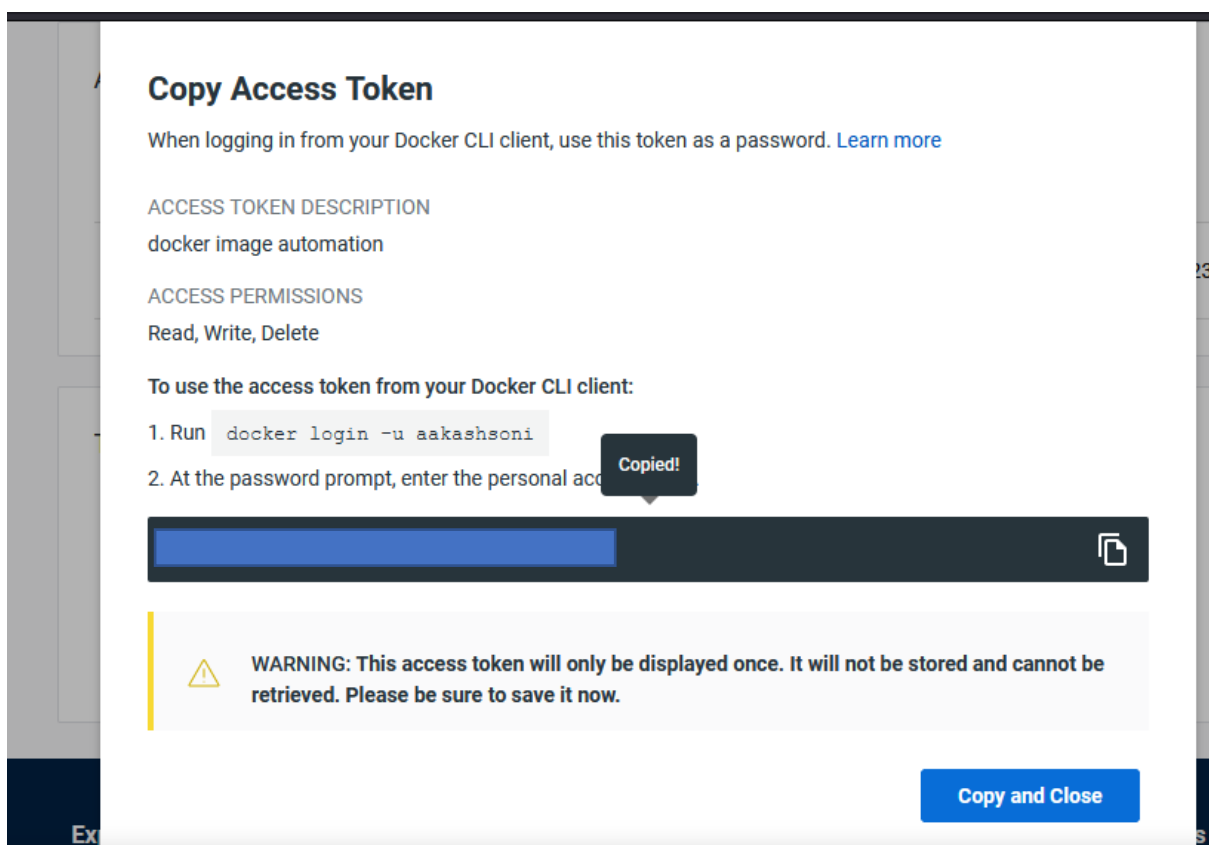
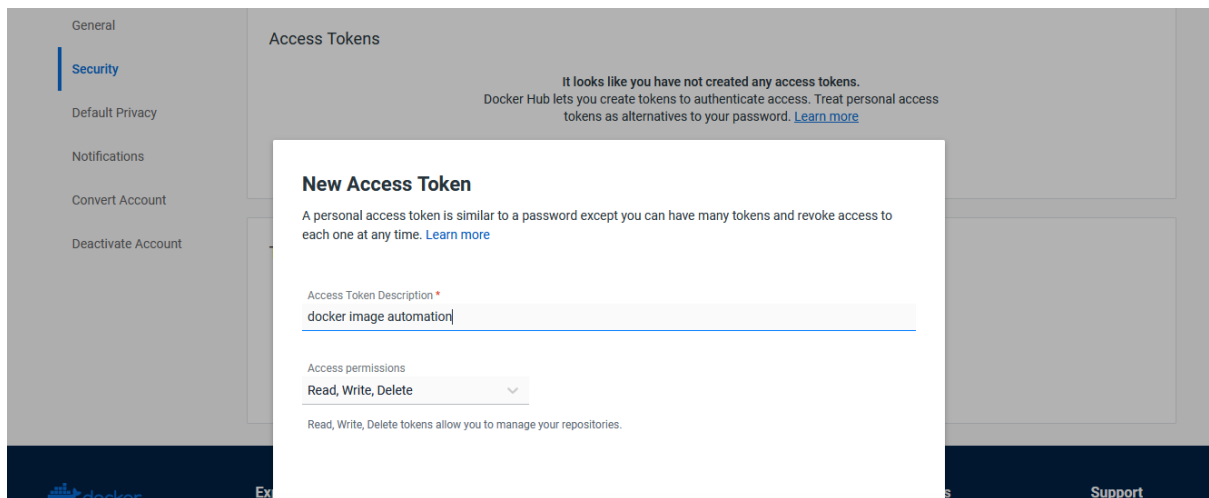


```
2
3 on:
4   push:
5     branches: [ "main" ]
6   pull_request:
7     branches: [ "main" ]
8
9 jobs:
10
11   build:
12
13     runs-on: ubuntu-latest
14
15     steps:
16       - uses: actions/checkout@v3
17       - name: Build the Docker image
18         run: docker build . --file Dockerfile --tag aakashsoni/dockerhub-push-automation
19       - name: Push the Docker image
20         run: docker login -u aakashsoni -p${{ secrets.DOCKER_TOKEN }} && docker push aakashsoni/dockerhub-push-automation
21
```

Now we will create and commit this file.

Step 8: Obtain docker hub token

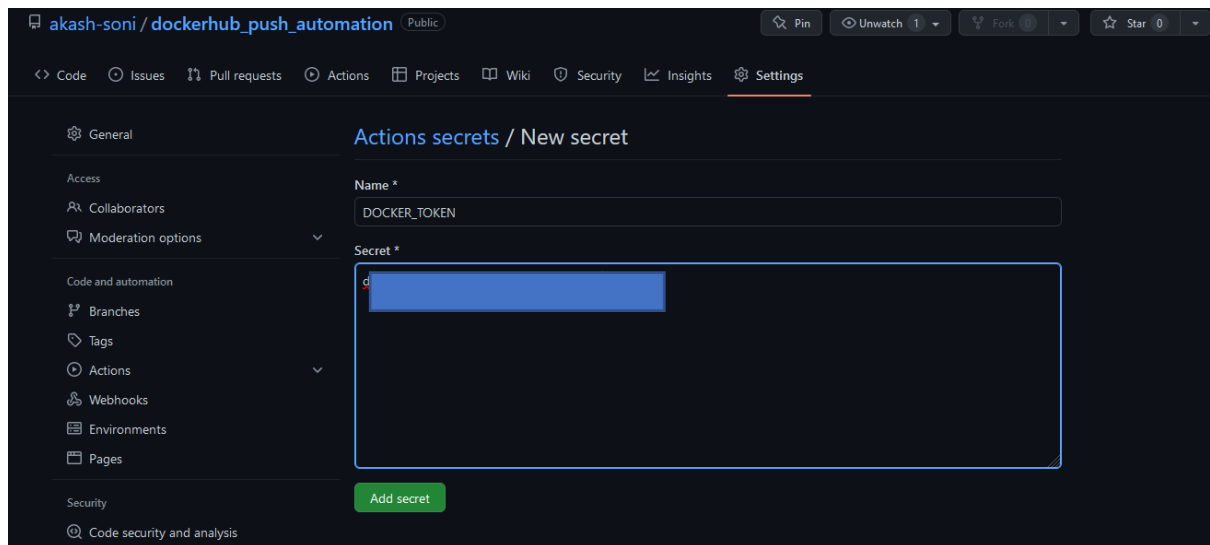
Go to docker hub → Profile → Account Settings → Security → New access token → give description and obtain the token. Make sure to keep token safe as it is like a password



Copy the token and keep it some place as it will not be available next time

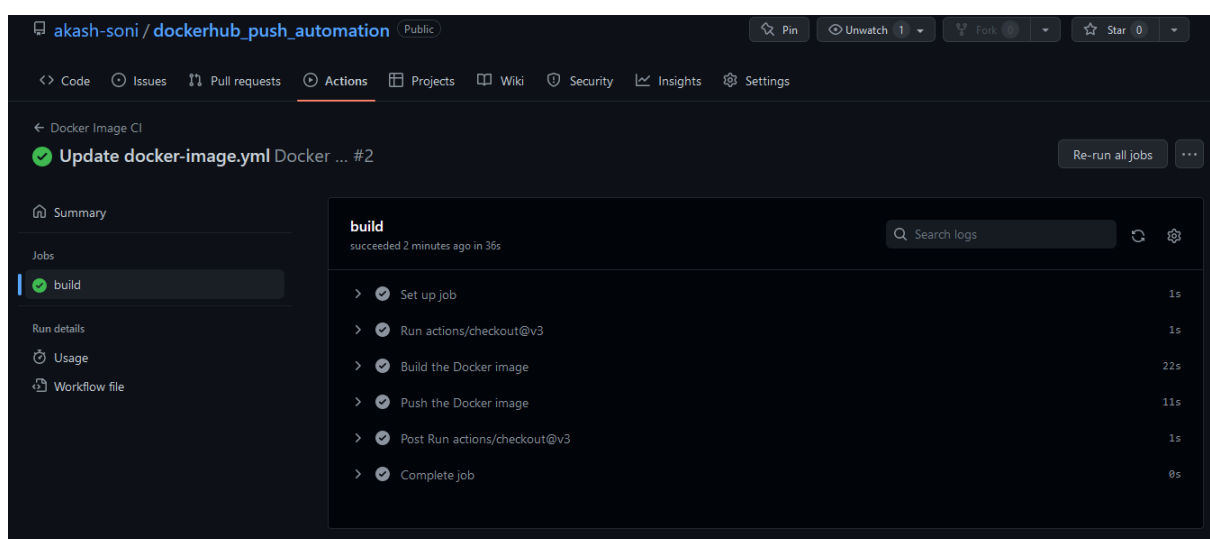
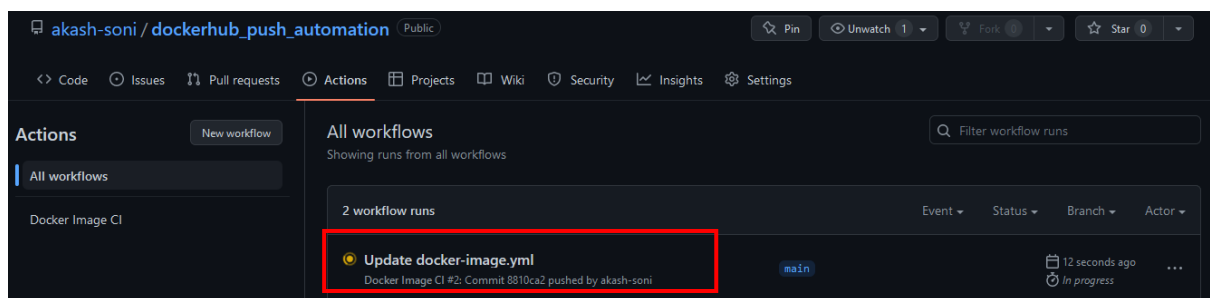
Step 9: Get back to Github → Repository Setting → Serets

Create the Secret token and paste the secret key.

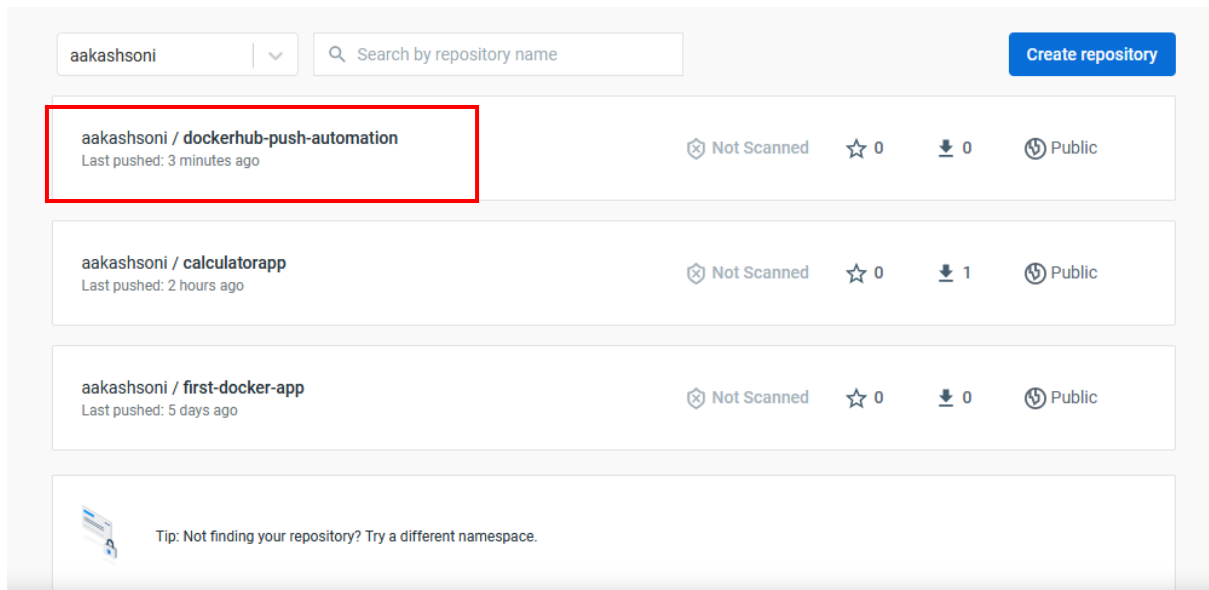


Click on Add secret.

Step 10: Now go to Actions tab, there we will notice that the docker image has started building



Now lets check on docker hub, whether the image has been pushed or not



So clearly, we can observe that the image has been pushed.

Hence, we have automated docker image pushes to docker hub.

Step 11: We do not want to trigger docker push for every commit so we can add a manual button **"Run workflow"**

Simply add line "workflow dispatch" into docker-image.yml file and commit the changes

