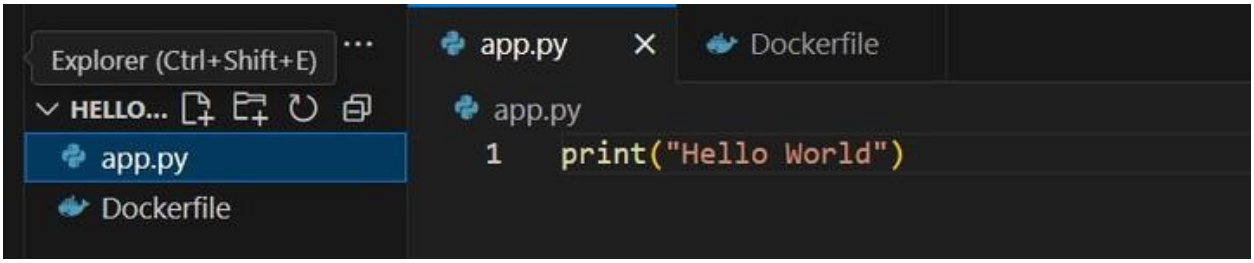
Discuss the following docker commands with example:

1. Create one .py file



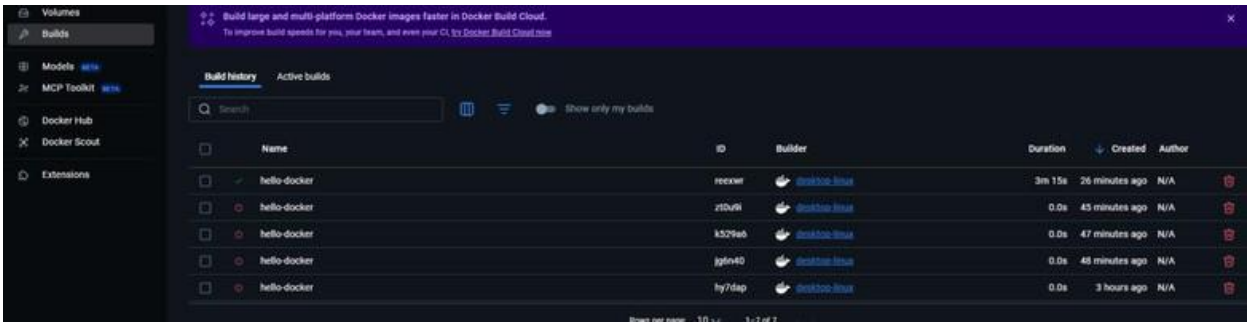
2. Create one docker file same one folder

```
    Directory: D:\hello-docker


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         8/13/2025  10:40 AM             20 app.py
-a----         8/13/2025  11:10 AM            188 Dockerfile
```

3. Docker build –t my-python-app(to build image)

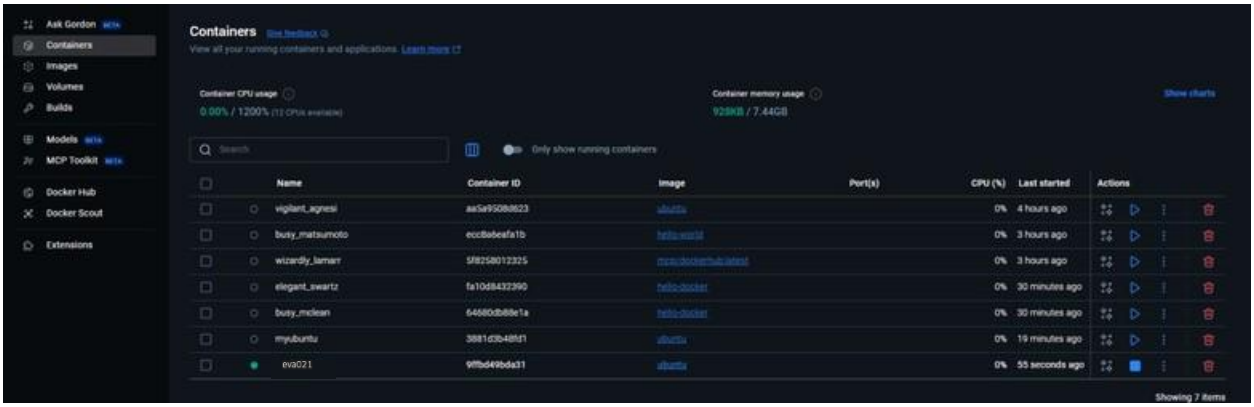
```
PS D:\hello-docker> docker build -t hello-docker .
[+] Building 195.5s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 227B
 => [internal] load metadata for docker.io/library/python:3.9
 => [auth] library/python:pull token for registry-1.docker.io
 => [internal] load .dockerignore
 => => transferring context: 2B
```

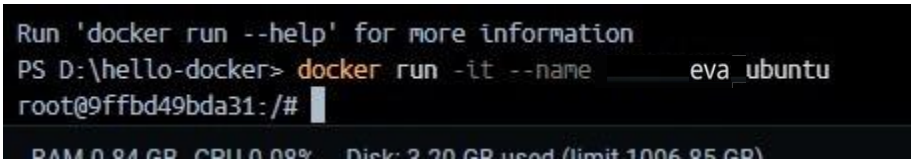
```
PS D:\hello-docker> docker run hello-docker
Hello World
```

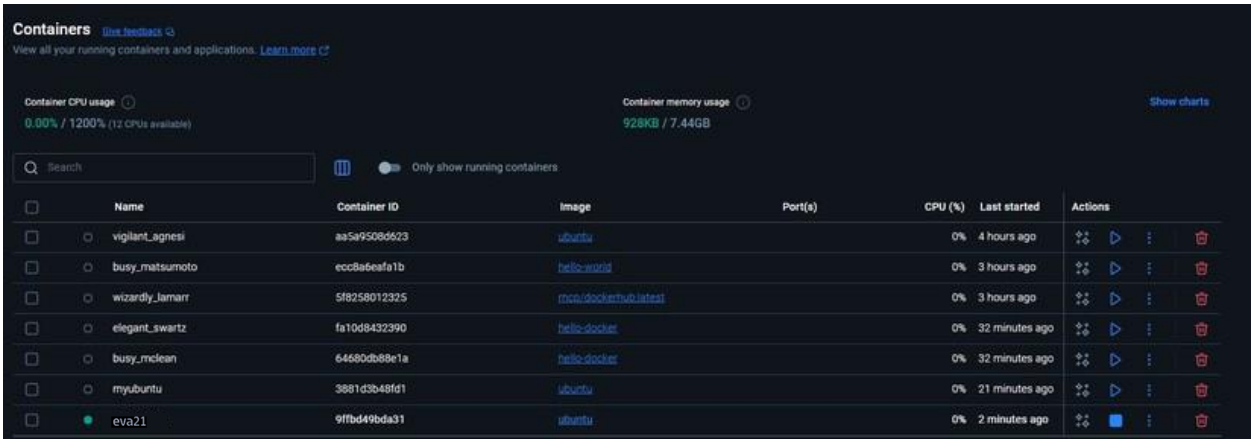


4. Docker run my-python-app

```
PS D:\hello-docker> docker run hello-docker
Hello World
```

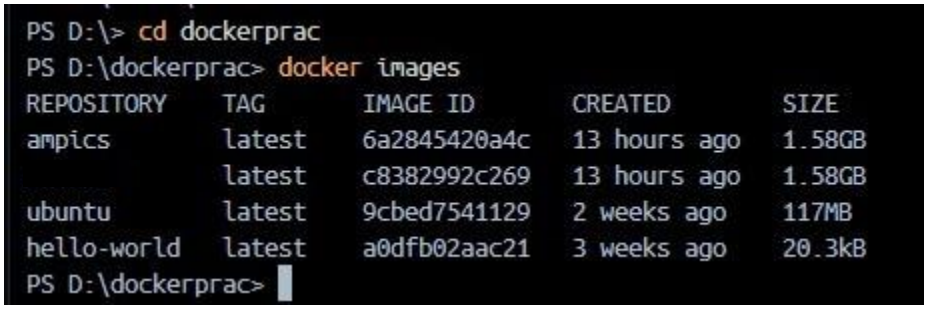






1. Discuss the following docker commands with example: a.

docker images



b. docker pull

```
PS D:\dockerprac\ampics> docker build -t eva    .
[+] Building 3.3s (8/8) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 227B
 => [internal] load metadata for docker.io/library/python:3.9
 => [internal] load .dockerignore
```

c. docker run

```
PS D:\dockerprac> docker run ampics
Hello, Docker!
PS D:\dockerprac>
```

d. docker container ls

```
PS D:\dockerprac\ampics> docker container ls
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS          PORTS     NAMES
f518b6e574c6   ubuntu    "/bin/bash"   40 seconds ago   Up 40 seconds             eva21
```

e. docker container ls –a

```
PS D:\dockerprac\ampics> docker container ls -a
CONTAINER ID   IMAGE          COMMAND                  CREATED         STATUS                     PORTS     NAMES
d35e6781c44c   ampics         "python app.py"          4 minutes ago   Exited (0) 4 minutes ago             awesome_feynman
08b9bf3fff22   ampics         "."                      4 minutes ago   Created                              romantic_northcutt
7d7bb22b54a3   ampics         "."                      5 minutes ago   Created                              suspicious_nobel
bdd5f87fe9df   ampics         "python app.py"          10 hours ago    Exited (0) 10 hours ago              guni
0fb41ae852d5   ampics         "python app.py"          10 hours ago    Exited (0) 10 hours ago              ampics_guni
666eeceaba01   ampics         "tail -f /dev/null"      10 hours ago    Exited (137) 10 hours ago            ampics_test
4358b5810dcd   ampics         "python app.py"          10 hours ago    Exited (0) 10 hours ago              wonderful_mcclintock
d38fc96b5171   beee2ec41e9a   "python app.py"          11 hours ago    Exited (0) 11 hours ago              ampics-container
3804d18731e4   beee2ec41e9a   "python app.py"          12 hours ago    Exited (0) 12 hours ago              myapp
016146777d1f   ubuntu         "/bin/bash"              12 hours ago    Exited (137) 12 hours ago            mycontainer
c98f66ac2897   ubuntu:latest  "/bin/bash"              12 hours ago    Exited (0) 12 hours ago              tender_northcutt
```

f. docker search

```
PS D:\dockerprac\ampics> docker search mysql
NAME                      DESCRIPTION                                     STARS     OFFICIAL
mysql                     MySQL is a widely used, open-source relation…   15904     [OK]
bitnami/mysql             Bitnami container image for MySQL               141
circleci/mysql            MySQL is a widely used, open-source relation…   32
bitnamicharts/mysql       Bitnami Helm chart for MySQL                    0
cimg/mysql                                                                3
ubuntu/mysql              MySQL open source fast, stable, multi-thread…   70
google/mysql              MySQL server for Google Compute Engine          26
linuxserver/mysql         A Mysql container, brought to you by LinuxSe…   48
elestio/mysql             Mysql, verified and packaged by Elestio         1
```

g. docker logs container_id

```
PS D:\dockerprac\ampics> docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED         STATUS         PORTS     NAMES
f518b6e574c6   ubuntu    "/bin/bash"   6 minutes ago   Up 6 minutes             eva21
PS D:\dockerprac\ampics> docker logs f518b6e574c6
root@f518b6e574c6:/# ^C
root@f518b6e574c6:/# ^C
root@f518b6e574c6:/# ^C
```

h. docker logs –f container_id

```
PS D:\dockerprac\ampics> docker logs -f myapp
Hello, Docker!
PS D:\dockerprac\ampics> docker logs -f 3804d18731e4
Hello, Docker!
PS D:\dockerprac\ampics>
```

i. docker container stop

```
PS D:\dockerprac\ampics> docker container stop myapp
myapp
PS D:\dockerprac\ampics>
```

j. docker image inspect image_id

```
PS D:\dockerprac\ampics> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
eva21         latest    a8c2d24376d4   14 hours ago   1.58GB
myimage       latest    3be6a9a51323   14 hours ago   1.58GB
ampics        latest    6a2845420a4c   14 hours ago   1.58GB
ubuntu        latest    9cbed7541129   2 weeks ago    117MB
hello-world   latest    a0dfb02aac21   3 weeks ago    20.3kB
PS D:\dockerprac\ampics> docker image inspect 3be6a9a51323
[
    {
        "Id": "sha256:3be6a9a51323be02988be2b1dddaed06bc6e0c48577f4be2eaf7971dd9b70313",
        "RepoTags": [
            "myimage:latest"
        ],
        "RepoDigests": [
            "myimage@sha256:3be6a9a51323be02988be2b1dddaed06bc6e0c48577f4be2eaf7971dd9b70313"
        ],
```

k. docker image remove image_name

```
myimage       latest    3be6a9a51323   14 hours ago   1.58GB
ubuntu        latest    9cbed7541129   2 weeks ago    117MB
hello-world   latest    a0dfb02aac21   3 weeks ago    20.3kB
PS D:\dockerprac\ampics> docker image rmi 3be6a9a51323
Untagged: myimage:latest
Deleted: sha256:3be6a9a51323be02988be2b1dddaed06bc6e0c48577f4be2eaf7971dd9b70313
```

l. docker container pause container_id
m. docker container uppause container_id

```
PS D:\dockerprac\ampics> docker container unpause f518b6e574c6
f518b6e574c6
PS D:\dockerprac\ampics>
```

n. docker container kill container_id

```
PS D:\dockerprac\ampics> docker container ls
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS          PORTS     NAMES
f518b6e574c6   ubuntu    "/bin/bash"   34 minutes ago   Up 34 minutes
PS D:\dockerprac\ampics> docker container kill f518b6e574c6
f518b6e574c6
PS D:\dockerprac\ampics>
```

o. docker container prune

```
PS D:\dockerprac\ampics> docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N]
```

p. docker system

```
PS D:\dockerprac\ampics> docker system
Usage:  docker system COMMAND

Manage Docker

Commands:
  df          Show docker disk usage
  events      Get real time events from the server
  info        Display system-wide information
  prune       Remove unused data

Run 'docker system COMMAND --help' for more information on a command.
PS D:\dockerprac\ampics>
```

q. docker system df

```
PS D:\dockerprac\ampics> docker system df
TYPE            TOTAL     ACTIVE    SIZE      RECLAIMABLE
Images          4         4         1.695GB   768.8MB (45%)
Containers      15        0         1.753MB   1.753MB (100%)
Local Volumes   0         0         0B        0B
Build Cache     15        0         32.77kB   32.77kB
PS D:\dockerprac\ampics>
```

r. docker system event

```
PS D:\dockerprac\ampics> docker system events
PS D:\dockerprac\ampics>
```

```
PS D:\dockerprac\ampics> docker system events
2025-09-05T09:28:54.949652748+05:30 container create da9e43513e4304a5b7a28a17b42290680bd8014f88dfc9be0d554d
2025-09-05T09:28:54.953018130+05:30 container attach da9e43513e4304a5b7a28a17b42290680bd8014f88dfc9be0d554d
2025-09-05T09:28:55.136666938+05:30 network disconnect d9e835a4d9b240754378612a079e43f0769771c6e068e6d3a1a3
ridge, type=bridge)
2025-09-05T09:29:19.248611638+05:30 container create b94d41017889ade56e0962b09e702abe8c709248d41a1396db1220
2025-09-05T09:29:19.252248855+05:30 container attach b94d41017889ade56e0962b09e702abe8c709248d41a1396db1220
2025-09-05T09:29:19.455161520+05:30 network connect d9e835a4d9b240754378612a079e43f0769771c6e068e6d3a1a3e87
ge, type=bridge)
2025-09-05T09:29:19.469970247+05:30 container start b94d41017889ade56e0962b09e702abe8c709248d41a1396db1220d
2025-09-05T09:29:19.695922852+05:30 network disconnect d9e835a4d9b240754378612a079e43f0769771c6e068e6d3a1a3
ridge, type=bridge)
2025-09-05T09:29:19.704178353+05:30 container die b94d41017889ade56e0962b09e702abe8c709248d41a1396db1220d71
```

s. docker system prune –a

```
PS D:\dockerprac> docker system prune -a
>>
WARNING! This will remove:
  - all stopped containers
  - all networks not used by at least one container
  - all images without at least one container associated to them
  - all build cache

Are you sure you want to continue? [y/N]
```

t. docker stats

```
CONTAINER ID   NAME      CPU %     MEM USAGE / LIMIT   MEM %     NET I/O   BLOCK I/O   PIDS
```

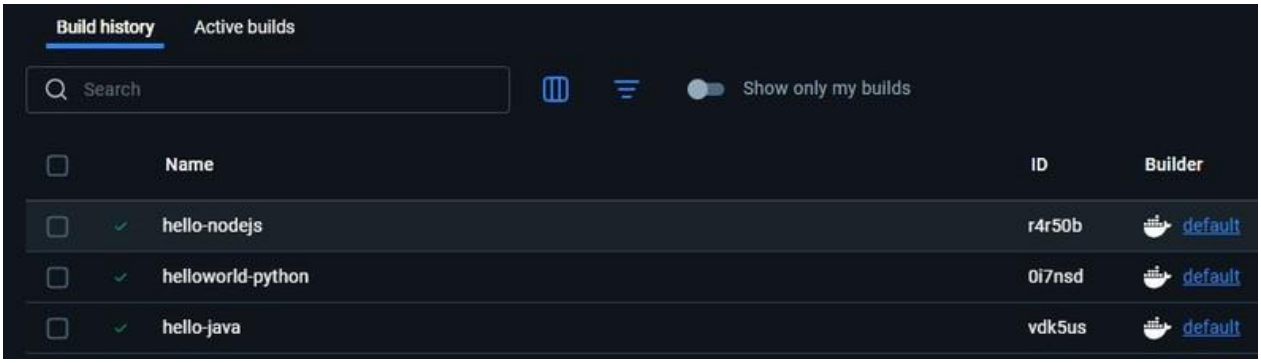
u. docker stats container_id

```
CONTAINER ID   NAME        CPU %     MEM USAGE / LIMIT   MEM %     NET I/O   BLOCK I/O   PIDS
f518b6e574c6               0.00%     0B / 0B             0.00%     0B / 0B   0B / 0B     0
```

2. Pull images of hello-world-java, helloworld-python, hello-world-

nodejs. Create containers with them and check for response using run docker command.

```
PS D:\dockerprac> docker container ls -a
CONTAINER ID   IMAGE                COMMAND                  CREATED              STATUS                          PORTS     NAMES
43c35a46fd80   hello-world-nodejs   "docker-entrypoint.s…"   8 minutes ago        Exited (0) 8 minutes ago                  musing_mclean
f0ab51ef5105   helloworld-python    "python app.py"          9 minutes ago        Exited (0) 9 minutes ago                  distracted_ganguly
a5383132a023   hello-world-java     "java Main"              9 minutes ago        Exited (0) 9 minutes ago                  kind_kepler
b94d41017889   ampics               "python app.py"          42 minutes ago       Exited (0) 42 minutes ago                 hopeful_sinoussi
da9e43513e43   ampics               "."                      42 minutes ago       Created                                   admiring_poincare
f518b6e574c6   ubuntu               "/bin/bash"              About an hour ago    Exited (137) 52 minutes ago               eva       0
d35e6781c44c   ampics               "python app.py"          2 hours ago          Exited (0) 2 hours ago                    awesome_feynman
08b9bf3fff22   ampics               "."                      2 hours ago          Created                                   romantic_northcutt
7d7bb22b54a3   ampics               "."                      2 hours ago          Created                                   suspicious_nobel
bdd5f87fe9df   ampics               "python app.py"          11 hours ago         Exited (0) 11 hours ago                   guni
0fb41ae852d5   ampics               "python app.py"          12 hours ago         Exited (0) 12 hours ago                   ampics_guni
666eeceaba01   ampics               "tail -f /dev/null"      12 hours ago         Exited (137) 11 hours ago                 ampics_test
```



3. Update above program to create three containers in detached mode.

docker-compose.yml

mydocker_pra3 > docker-compose.yml

```yaml
version: '3'
Run All Services
services:
  Run Service
  container1:
    image: nginx
    container_name: container1
    restart: always
  Run Service
  container2:
    image: nginx
    container_name: container2
    restart: always
  Run Service
  container3:
    image: nginx
    container_name: container3
    restart: always
```

```
PS D:\DockerPrac\mydocker_pra3> docker-compose up -d
>>
time="2025-09-25T18:56:18+05:30" level=warning msg="D:\\DockerPrac\\mydocker_pra3\\docker-compose.yml:
the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 3/3
 ✓ Container container2  Started                                                    0.7s
 ✓ Container container1  Started                                                    0.7s
 ✓ Container container3  Started                                                    0.7s
PS D:\DockerPrac\mydocker_pra3>
```

4. Demonstrate the docker image history command for mysql with output.

```
PS D:\DockerPrac\mydocker_pra3> docker pull mysql:latest
latest: Pulling from library/mysql
619a14803e82: Pull complete
d9301ae294fe: Pull complete
4c8e7ce47d40: Pull complete
e522a8b4b86f: Pull complete
1620875f220d: Pull complete
872c71b4bef6: Pull complete
e81ddb8dbdb4: Pull complete
806f49275cbf: Pull complete
6457b1401253: Pull complete
930d9dafee77: Pull complete
Digest: sha256:91447968e66961302339ec4dc4d385f5e1a957d98e63c7d52ecf8b1de0907346
Status: Downloaded newer image for mysql:latest
docker.io/library/mysql:latest
PS D:\DockerPrac\mydocker_pra3> docker history mysql:latest
IMAGE          CREATED        CREATED BY                                      SIZE      COMMENT
91447968e669   42 hours ago   CMD ["mysqld"]                                  0B        buildkit.docker
file.v0
<missing>      42 hours ago   EXPOSE map[3306/tcp:{} 33060/tcp:{}]            0B        buildkit.docker
file.v0
<missing>      42 hours ago   ENTRYPOINT ["docker-entrypoint.sh"]             0B        buildkit.docker
file.v0
<missing>      42 hours ago   COPY docker-entrypoint.sh /usr/local/bin/ # …   32.8kB    buildkit.docker
file.v0
<missing>      42 hours ago   VOLUME [/var/lib/mysql]                         0B        buildkit.docker
file.v0
<missing>      42 hours ago   RUN /bin/sh -c set -eux;  microdnf install -…   693MB     buildkit.docker
file.v0
<missing>      42 hours ago   ENV MYSQL_SHELL_VERSION=9.4.0-1.el9             0B        buildkit.docker
file.v0
<missing>      42 hours ago   RUN /bin/sh -c set -eu;  {   echo '[mysql-to…   16.4kB    buildkit.docker
file.v0
<missing>      42 hours ago   RUN /bin/sh -c set -eux;  microdnf install -…   146MB     buildkit.docker
file.v0
<missing>      42 hours ago   RUN /bin/sh -c set -eu;  {   echo '[mysqlinn…   16.4kB    buildkit.docker
```

5. Demonstrate the docker inspect image_id command with example.

```
PS D:\DockerPrac\mydocker_pra3> docker images
REPOSITORY          TAG           IMAGE ID       CREATED         SIZE
mysql               latest        91447968e669   42 hours ago    1.26GB
hello-world-nodejs  latest        bec3802bfafa   2 weeks ago     274MB
helloworld-python   latest        1b07fa47e508   2 weeks ago     180MB
hello-world-java    latest        484f8b116dbf   2 weeks ago     673MB
eva                 latest        a8c2d24376d4   3 weeks ago     1.58GB
ampics              latest        c9e4b8c5429e   3 weeks ago     1.58GB
ubuntu              latest        9cbed7541129   5 weeks ago     117MB
nginx               latest        d5f28ef21aab   6 weeks ago     279MB
hello-world         latest        a0dfb02aac21   6 weeks ago     20.3kB
python              3.9           10c3875a6435   6 weeks ago     1.58GB
node                14            a158d3b9b4e3   2 years ago     1.35GB
openjdk             11-jdk-slim   868a4f2151d3   3 years ago     673MB
PS D:\DockerPrac\mydocker_pra3> docker inspect a8c2d24376d4
```

```
PS D:\DockerPrac\mydocker_pra3> docker inspect a8c2d24376d4
[
    {
        "Id": "sha256:a8c2d24376d4af8b499a4504d3158e9c374e5601594f076327f2a75096a08690",
        "RepoTags": [
            "eva21 latest"
        ],
        "RepoDigests": [
            "eva21@sha256:a8c2d24376d4af8b499a4504d3158e9c374e5601594f076327f2a75096a08690"
        ],
        "Parent": "",
        "Comment": "buildkit.dockerfile.v0",
        "Created": "2025-09-04T13:21:32.04592519Z",
        "DockerVersion": "",
        "Author": "",
        "Architecture": "amd64",
        "Os": "linux",
        "Size": 404410268,
        "GraphDriver": {
            "Data": null,
            "Name": "overlayfs"
        },
        "RootFS": {
            "Type": "layers",
            "Layers": [
                "sha256:cb9eb84282d037ad85b02cf671ef6ca766c43bc957f88b048d16dd6deb6e68b8",
                "sha256:7aabebb55065f28d3cdbb2992e7d23690d6bf2c2ba89db800ffd9c9dda4fa56f",
                "sha256:fbb12b2180e78de1b5f766c6f7efc90c64bf45fbe703b053235feacb3d854e4f",
                "sha256:b72242dc7fb054dbe447bb0d243cda9cbb6b45ea8077f9b269de5187beb98650",
                "sha256:e805765fe39d87e84218b0b5752d1c54c25a62cb8c01cdca57f7fa12da7bdfce",
                "sha256:7862b2568aaedd645540782b0439bd0bb41493a3c8cb2efe66d09f0366204607",
                "sha256:1a039d61390137eb3d95275bd9a21c1ee3ed38cd355b233e8c93ddbe29a7171a",
                "sha256:708a5dbfcb11126612d60fb4f55e918ab300122460181c9833fa59e62ee5a312",
                "sha256:fda08571b50fa40b011874b56738c9cb7b22930438d00f8ff7b2b77209be63b1"
            ]
```

6. Demonstrate the docker stop and docker kill commands with example.

```
PS D:\DockerPrac\mydocker_pra3> docker run -d --name mynginx nginx
85d48d11a68f1bda80c34f9b710d778047c9ebe8761feaa6099efc3cb902ffe5
PS D:\DockerPrac\mydocker_pra3> docker stop mynginx
mynginx
```

```
PS D:\DockerPrac\mydocker_pra3> docker kill container3
container3
PS D:\DockerPrac\mydocker_pra3> docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS     NAMES
23fe04f79f8c   nginx     "/docker-entrypoint.…"   2 minutes ago    Up 2 minutes    80/tcp    container120
41dc7c270519   nginx     "/docker-entrypoint.…"   17 minutes ago   Up 17 minutes   80/tcp    container2
02cf17f85dfa   nginx     "/docker-entrypoint.…"   17 minutes ago   Up 17 minutes   80/tcp    container1
PS D:\DockerPrac\mydocker_pra3>
```

7. Demonstrate the docker container prune command.

```
PS D:\DockerPrac\mydocker_pra3> docker ps -a
CONTAINER ID   IMAGE                COMMAND                  CREATED          STATUS
TS     NAMES
23fe04f79f8c   nginx                "/docker-entrypoint.…"   4 minutes ago    Up 4 minutes
tcp    container120
85d48d11a68f   nginx                "/docker-entrypoint.…"   7 minutes ago    Exited (0) 6 minutes ago
       mynginx
30f121451901   nginx                "/docker-entrypoint.…"   19 minutes ago   Exited (137) 2 minutes ago
       container3
41dc7c270519   nginx                "/docker-entrypoint.…"   19 minutes ago   Up 19 minutes
tcp    container2
02cf17f85dfa   nginx                "/docker-entrypoint.…"   19 minutes ago   Up 19 minutes
tcp    container1
cc1fdddb2f45   ampics               "python app.py"          10 days ago      Exited (0) 10 days ago
       optimistic_murdock
3094a59fed4e   ubuntu               "/bin/bash"              10 days ago      Exited (255) 7 days ago
       eva_24032211021
571feddcafe1   ampics               "python app.py"          10 days ago      Exited (0) 10 days ago
       laughing_cerf
76f3a36a914e   6a2845420a4c         "python app.py"          10 days ago      Exited (0) 10 days ago
       cool_clarke
373d2472238f   6a2845420a4c         "."                      10 days ago      Created
       xenodochial_buck
43c35a46fd80   hello-world-nodejs   "docker-entrypoint.s…"   2 weeks ago      Exited (0) 2 weeks ago
       musing_mclean
f0ab51ef5105   helloworld-python    "python app.py"          2 weeks ago      Exited (0) 2 weeks ago
       distracted_ganguly
a5383132a023   hello-world-java     "java Main"              2 weeks ago      Exited (0) 2 weeks ago
       kind_kepler
b94d41017889   6a2845420a4c         "python app.py"          2 weeks ago      Exited (0) 2 weeks ago
       hopeful_sinoussi
da9e43513e43   6a2845420a4c         "."                      2 weeks ago      Created
       admiring_poincare
f518b6e574c6   ubuntu               "/bin/bash"              2 weeks ago      Exited (137) 2 weeks ago
       eva21
```

```
PS D:\DockerPrac\mydocker_pra3> docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
85d48d11a68f1bda80c34f9b710d778047c9ebe8761feaa6099efc3cb902ffe5
30f1214519015a528e517a5479f7d16e3f35f4aa70020a05ab0afd411fae1b72
cc1fdddb2f459e5149f9a6e0b34c2ca41ed9966cd74881146f28e7a7d95a0842
3094a59fed4e3c53b3b2b6c6c56f71604bea3a5c099f6fb18001c1639adfc86f
571feddcafe1cf7e8c2bd0529e8f24e02b5f22a4544e1c278d20d1e5af9f462f
76f3a36a914e7a460104b48beb661bcbe6103639bb94e3f3c29ee7a6fa51c0db
373d2472238fa2e53032fa9620c425f28792391547824c9f378ea80de767212d
43c35a46fd801ac7d669ef737a3247e74e9f5c57b399e88eb33f93f76b242f58
f0ab51ef5105dc3816fcf89ccb10e2eabc599c80dff40780d99b25d5c3cc5c14
a5383132a023639c8c1cb14288d58a429407e106fa9813fe759fe333ebdbcb7d
b94d41017889ade56e0962b09e702abe8c709248d41a1396db1220d7195da709
da9e43513e4304a5b7a28a17b42290680bd8014f88dfc9be0d554d9ffb23de91
f518b6e574c674127289e9629a756e1af398f7da7f0207dc4bf4a0dfe37f0dc6
d35e6781c44c5a7afee3209fb46353756ae7defb88164e500c7424a213010da0
08b9bf3fff22907d36c39c1248f1d08a8a969a180dd0dac68fc00fffc62be04e
7d7bb22b54a35688f80ed237eba8100c3ed2c4bde992aac55d39e4e35a2179c7
bdd5f87fe9dff59482e57a35fa6388adbb01ad3d057ed55c9f6a48af6834ebda
0fb41ae852d5dcd3f5028cf57de4197ba4f349fa1bde4be3d8e7b51f41579361
666eeceaba01cf10cfbe09ef9ba02c1388abcf95cab78f3676e13ff74e07eae2
4358b5810dcdb1f3dc61c3207a9a455006ba6ad6d1b730db9b658d492493d880
d38fc96b517123ae29c34cd9d6f0a57a5f5fcf20d57b88cacac6b70d53d5a8de
3804d18731e40ae31e7fe170f1630ce523978e943540d7c548da69da599b380a
016146777d1fe9550082122abfcac0446e2d3b8a94e3a1cbd83f09e615afaa34
c98f66ac2897eff2d9ec87df8b7b32bea097acda35fd2f537975cc75a0cca074
f230b50959d926725579e55c73c132bedb8668628cd76dc91e0db408cb547d51
6257ca8c77a22be27d9935c0cef4c766f156ae2e31904edb0711f809f630655e
69f58df3594fcad64d6650469900b93da74a46987131d6d9bf267bcdb52a2ece

Total reclaimed space: 3.174MB
PS D:\DockerPrac\mydocker_pra3>
```

```
PS D:\DockerPrac\mydocker_pra3> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS     NAMES
23fe04f79f8c   nginx     "/docker-entrypoint.…"   7 minutes ago    Up 7 minutes    80/tcp    container120
41dc7c270519   nginx     "/docker-entrypoint.…"   22 minutes ago   Up 22 minutes   80/tcp    container2
02cf17f85dfa   nginx     "/docker-entrypoint.…"   22 minutes ago   Up 22 minutes   80/tcp    container1
PS D:\DockerPrac\mydocker_pra3> docker container prune -f
Total reclaimed space: 0B
```

8. Demonstrate difference between docker container ls and docker container ls –a command.

```
PS D:\DockerPrac\mydocker_pra3> docker container ls
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS     NAMES
23fe04f79f8c   nginx     "/docker-entrypoint.…"   9 minutes ago    Up 9 minutes    80/tcp    container120
41dc7c270519   nginx     "/docker-entrypoint.…"   24 minutes ago   Up 24 minutes   80/tcp    container2
02cf17f85dfa   nginx     "/docker-entrypoint.…"   24 minutes ago   Up 24 minutes   80/tcp    container1
PS D:\DockerPrac\mydocker_pra3> docker container ls -a
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS     NAMES
23fe04f79f8c   nginx     "/docker-entrypoint.…"   10 minutes ago   Up 10 minutes   80/tcp    container120
41dc7c270519   nginx     "/docker-entrypoint.…"   24 minutes ago   Up 24 minutes   80/tcp    container2
02cf17f85dfa   nginx     "/docker-entrypoint.…"   24 minutes ago   Up 24 minutes   80/tcp    container1
PS D:\DockerPrac\mydocker_pra3>
```

9. Demonstrate the docker system event command with proper example.

```
PS C:\Users\ eva>  docker run -d --name mynginx nginx
674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d7579db
PS C:\Users\ eva>  docker stop mynginx
mynginx
PS C:\Users\ eva>  docker rm mynginx
mynginx
PS C:\Users\ eva>
```

```
ut (Ctrl+Shift+U)  Prac\mydocker_pra3> docker system events
2025-09-25T19:26:14.353292307+05:30 container create 674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454
d7579db (desktop.docker.io/ports.scheme=v2, image=nginx, maintainer=NGINX Docker Maintainers <docker-maint@ngi
nx.com>, name=mynginx)
2025-09-25T19:26:14.741896571+05:30 network connect 3f06a9075def57954660b84b581945f1e92679cdb5f8475a10e15ab6f2
076ba1 (container=674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d7579db, name=bridge, type=bridge)
2025-09-25T19:26:14.772782434+05:30 container start 674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d
7579db (desktop.docker.io/ports.scheme=v2, image=nginx, maintainer=NGINX Docker Maintainers <docker-maint@ngin
x.com>, name=mynginx)
2025-09-25T19:26:36.111560304+05:30 container kill 674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d7
579db (desktop.docker.io/ports.scheme=v2, image=nginx, maintainer=NGINX Docker Maintainers <docker-maint@nginx
.com>, name=mynginx, signal=3)
2025-09-25T19:26:36.471776856+05:30 network disconnect 3f06a9075def57954660b84b581945f1e92679cdb5f8475a10e15ab
6f2076ba1 (container=674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d7579db, name=bridge, type=bridg
e)
2025-09-25T19:26:36.480990779+05:30 container stop 674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d7
579db (desktop.docker.io/ports.scheme=v2, image=nginx, maintainer=NGINX Docker Maintainers <docker-maint@nginx
.com>, name=mynginx)
2025-09-25T19:26:36.487516916+05:30 container die 674d61b419b31185f8173d6b82648bc944399476c508af4af9be35454d75
79db (desktop.docker.io/ports.scheme=v2, execDuration=21, exitCode=0, image=nginx, maintainer=NGINX Docker Mai
ntainers <docker-maint@nginx.com>, name=mynginx)
2025-09-25T19:26:48.676143695+05:30 container destroy 674d61b419b31185f8173d6b82648bc944399476c508af4af9be3545
4d7579db (desktop.docker.io/ports.scheme=v2, image=nginx, maintainer=NGINX Docker Maintainers <docker-maint@ng
inx.com>, name=mynginx)
```

10. Demonstrate the constraint on docker container memory usage.

```
PS D:\DockerPrac\mydocker_pra3> docker run -it --name my_memory_limited_container -m 200m ubuntu
root@0c8892d75918:/# cat /sys/fs/cgroup/memory/memory.limit_in_bytes
cat: /sys/fs/cgroup/memory/memory.limit_in_bytes: No such file or directory
root@0c8892d75918:/# docker run -it --name my_limited_swap_container -m 200m --memory-swap 300m ubuntu
bash: docker: command not found
root@0c8892d75918:/# apt update && apt install -y stress
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [34.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [2356 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/restricted amd64 Packages [117 kB]
```

```
root@0c8892d75918:/# stress --vm 1 --vm-bytes 250M --vm-hang 0
stress: info: [162] dispatching hogs: 0 cpu, 0 io, 1 vm, 0 hdd
^C
root@0c8892d75918:/# docker stats my_memory_limited_container
bash: docker: command not found
root@0c8892d75918:/#
```

11. Demonstrate the constraint on docker container cpu usage.

```
PS D:\DockerPrac\mydocker_pra3> docker run -it --name my_cpu_limited_container --cpus="1.5" ubuntu
root@dedc8508d3f0:/# docker run -it --name cpu_share_container --cpu-shares=512 ubuntu
```

```
CONTAINER ID   NAME                     CPU %     MEM USAGE / LIMIT   MEM %     NET I/O       BLOCK I/O     P
IDS
dedc8508d3f0   my_cpu_limited_container   0.00%     1016KiB / 7.62GiB   0.01%     872B / 126B   647kB / 0B    1
```

12. Create your own docker image with respect to hello-world-python using dockerfile and push it in your own repository on hub.docker.com.

helloworld-python > app.py

```
1   print("Hello World from Python")
2
```

helloworld-python > Dockerfile > ...

```
1  FROM python:3.9-slim
2  WORKDIR /app
3  COPY app.py .
4  CMD ["python", "app.py"]
5
```

```
PS D:\DockerPrac\helloworld-python> docker build -t yourdockerhubusername/hello-world-python:1.0 .
[+] Building 3.5s (2/2) FINISHED                                                    docker:desktop-linux
 => [internal] load build definition from Dockerfile                                              0.0s
 => => transferring dockerfile: 114B                                                              0.0s
 => ERROR [internal] load metadata for docker.io/library/python:3.9-slim                          3.4s
------
 > [internal] load metadata for docker.io/library/python:3.9-slim:
------
Dockerfile:1
--------------------
   1 | >>> FROM python:3.9-slim
   2 |     WORKDIR /app
   3 |     COPY app.py .
--------------------
```

```
PS D:\DockerPrac> docker login
Authenticating with existing credentials...

i Info → To login with a different account, run 'docker logout' followed by 'docker login'


Login Succeeded
PS D:\DockerPrac> docker tag hello-world-nodejs snehal120/hello-world-nodejs:1.0
PS D:\DockerPrac> docker push snehal120/hello-world-nodejs:1.0
The push refers to repository [docker.io/snehal120/hello-world-nodejs]
c119feee8fd1: Pushed
9fbefa337077: Pushed
ab0d54d50153: Pushed
41d0a18da0bb: Pushed
ef4fa56f51f6: Pushed
15962820dcf7: Pushed
184c306235e3: Pushed
979c86ff423d: Pushed
1.0: digest: sha256:bec3802bfafaaac40aa149ab9b1badf3806ad4b01c3a6a1c324a63b92a900dff size: 856
PS D:\DockerPrac> docker run -p 3000:3000 snehal120/hello-world-nodejs:1.0
Hello World from Node.js
PS D:\DockerPrac>
```

13. Create your own docker image with respect to hello-world-java using dockerfile and push it in your own repository on hub.docker.com.

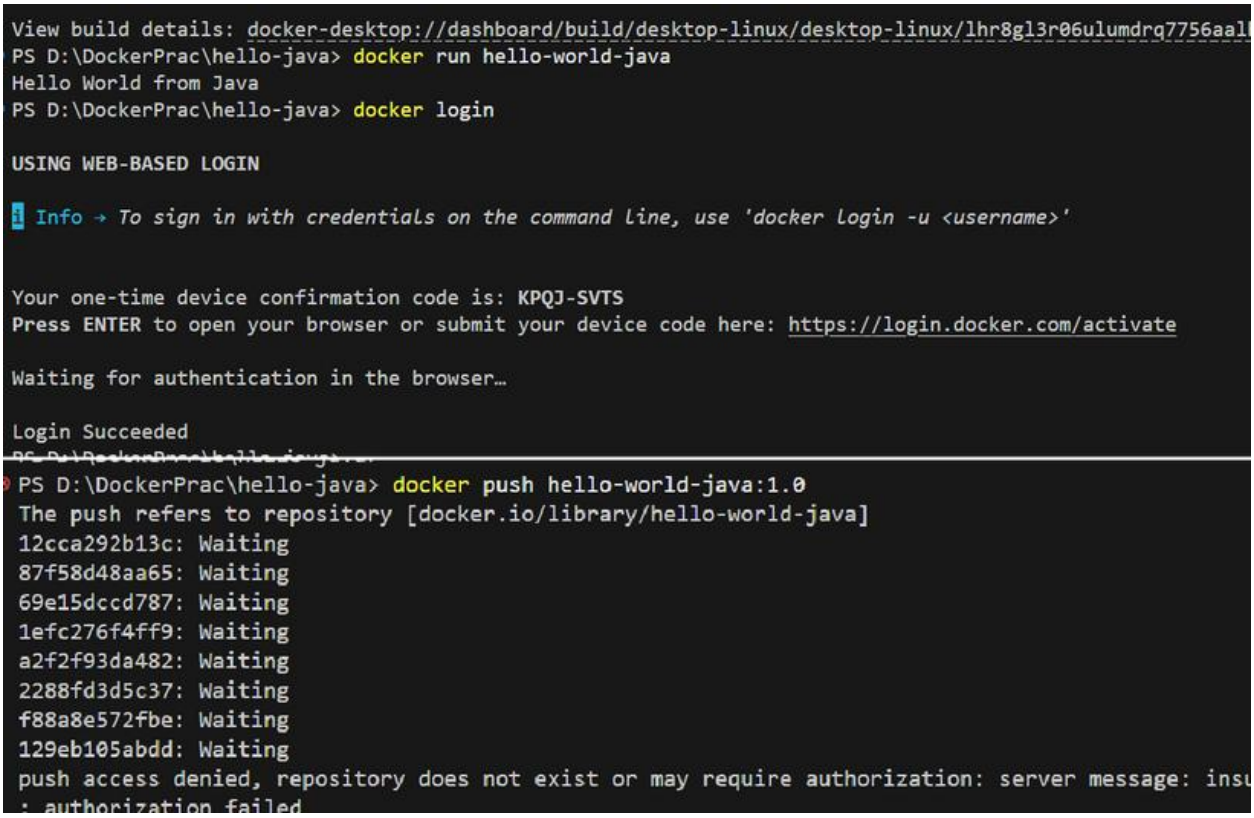
hello-java > Main.java

```java
public class Main {
    public static void main(String[] args) {
        System.out.println("Hello World from Java");
    }
}

```

hello-java > Dockerfile > ...

```
FROM openjdk:11-jdk-slim
WORKDIR /app
COPY Main.java .
RUN javac Main.java
CMD ["java", "Main"]

```

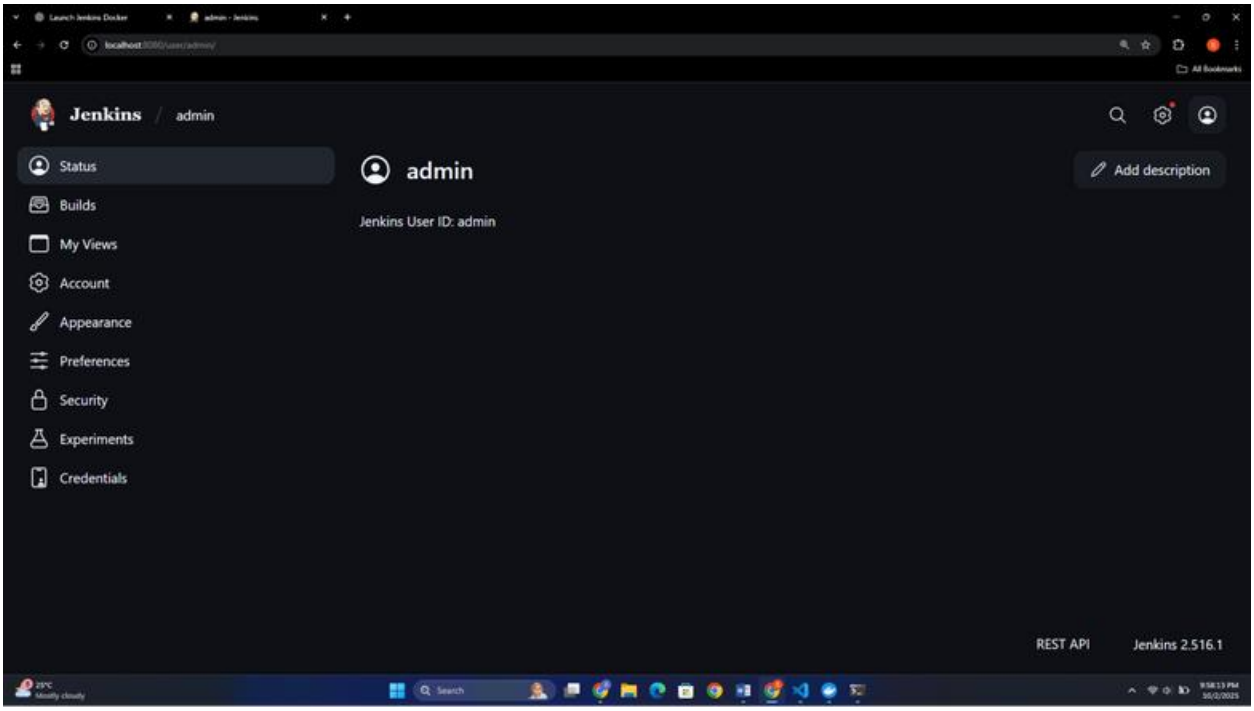
```
PS D:\DockerPrac> cd hello-java
PS D:\DockerPrac\hello-java> docker build -t hello-world-java:1.0 .
[+] Building 0.3s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 138B
 => [internal] load metadata for docker.io/library/openjdk:11-jdk-slim
 => [internal] load .dockerignore
 => => transferring context: 2B
 => [1/4] FROM docker.io/library/openjdk:11-jdk-slim@sha256:868a4f2151d38ba
 => => resolve docker.io/library/openjdk:11-jdk-slim@sha256:868a4f2151d38ba
```

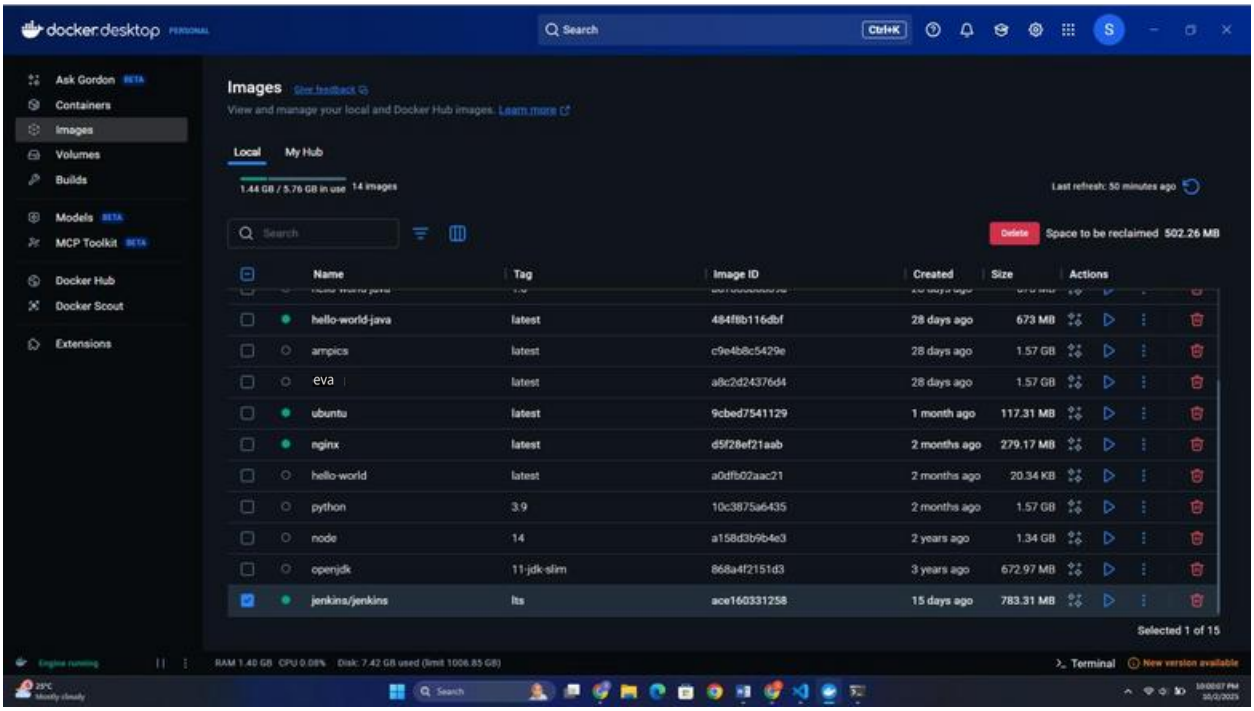


14. Create your own docker image with respect to hello-world-nodejs using dockerfile and push it in your own repository on hub.docker.com.

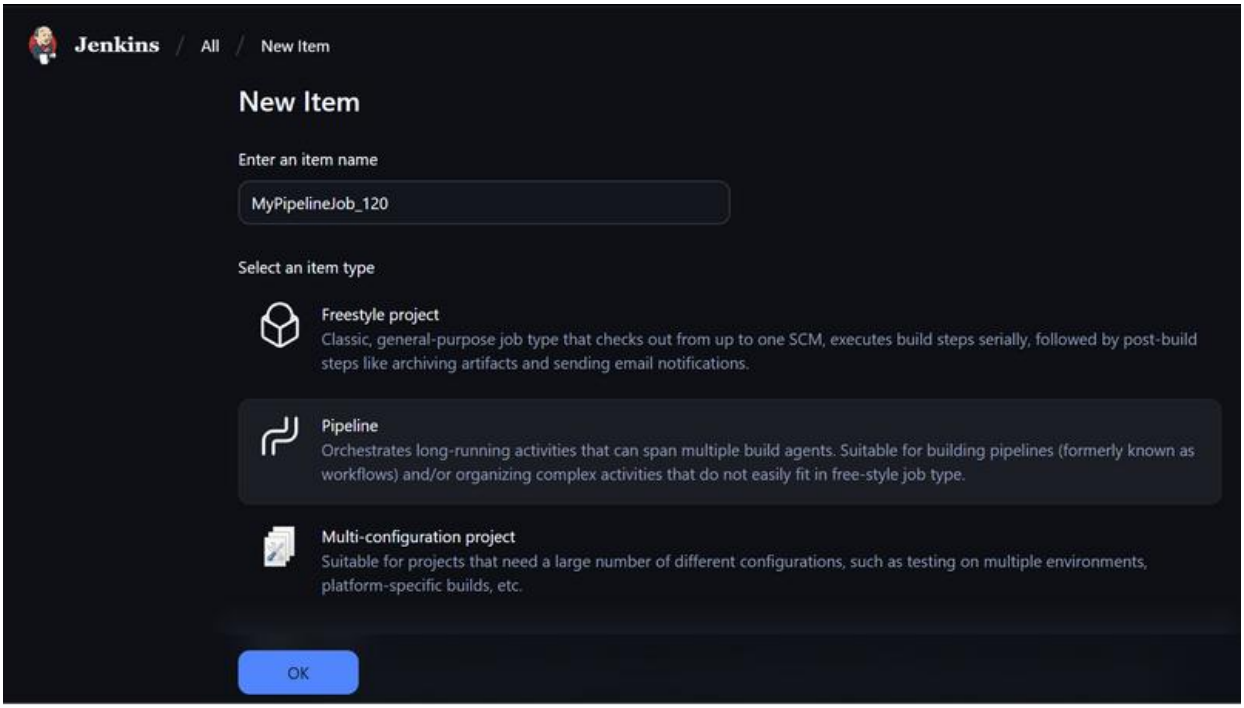
15. Demonstrate the process of launching Jenkins as Docker Container with practical steps.

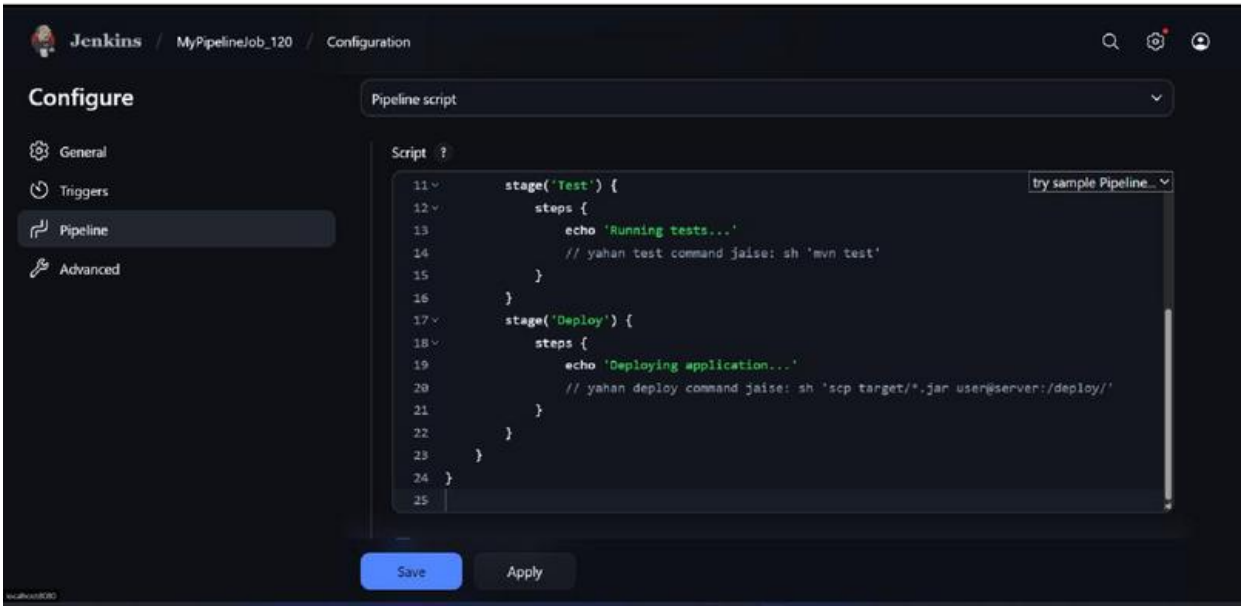
```
PS D:\DockerPrac> docker pull jenkins/jenkins:lts
lts: Pulling from jenkins/jenkins
8fb375ec14f3: Pulling fs layer
8fb375ec14f3: Pull complete
e4441ae29535: Pull complete
8fb375ec14f3: Pull complete
e4441ae29535: Pull complete
59c3eb56f065: Pull complete
4f19f207bd6e: Pull complete
5fe83599b627: Pull complete
7c1a19381ac9: Pull complete
195624e01063: Pull complete
c7acc196d9db: Pull complete
c9a178fb1e40: Pull complete
Digest: sha256:ace160331258aeff24581038e63ec5b5e8e969cebc9582a5ac7f0ed9fd20043b
Status: Downloaded newer image for jenkins/jenkins:lts
docker.io/jenkins/jenkins:lts
```

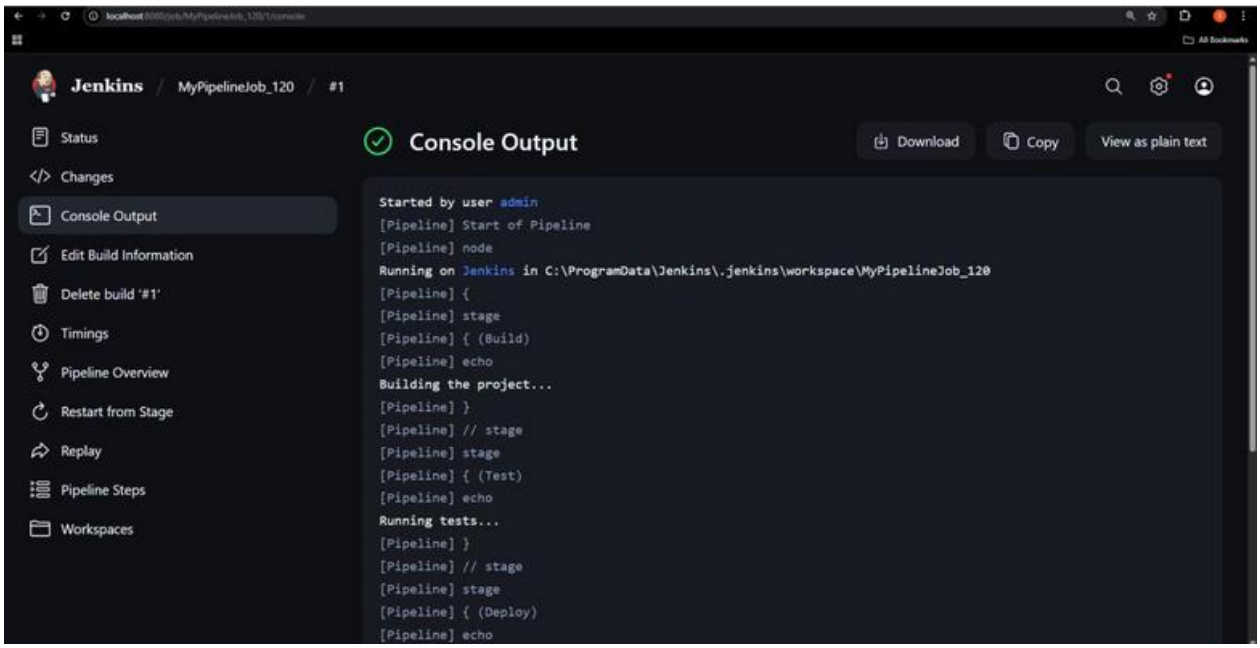




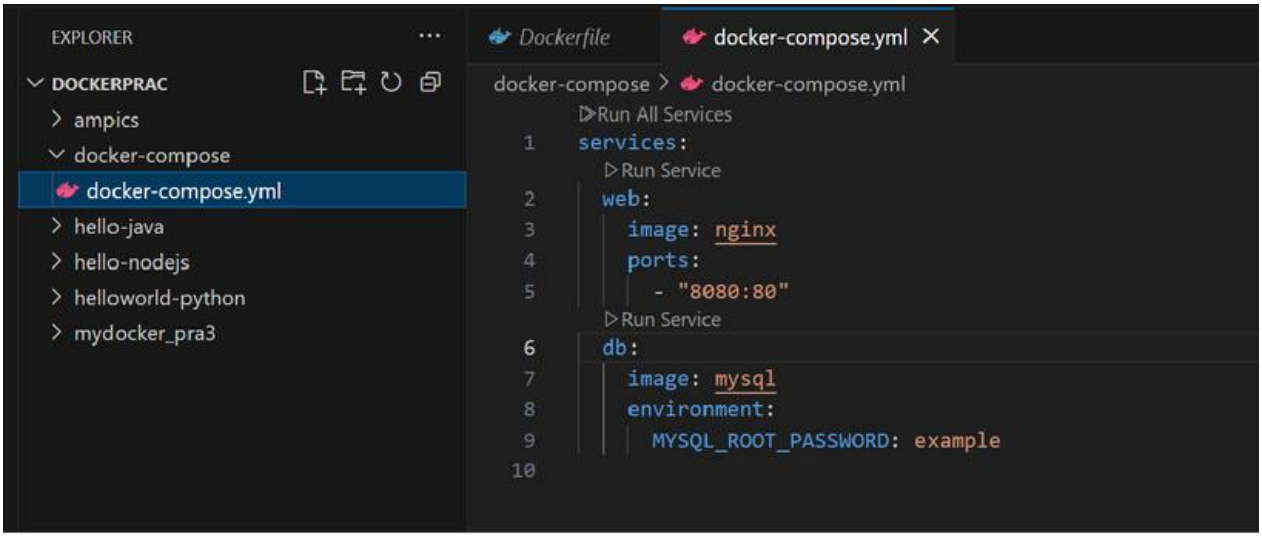
16. Create a Pipeline, Write a Script and Build a Job in Jenkins-Set up an automated workflow in Jenkins by creating a pipeline project, writing a Groovy-based script with build, test, and deploy steps, and then executing the job to enable CI/CD automation. ,

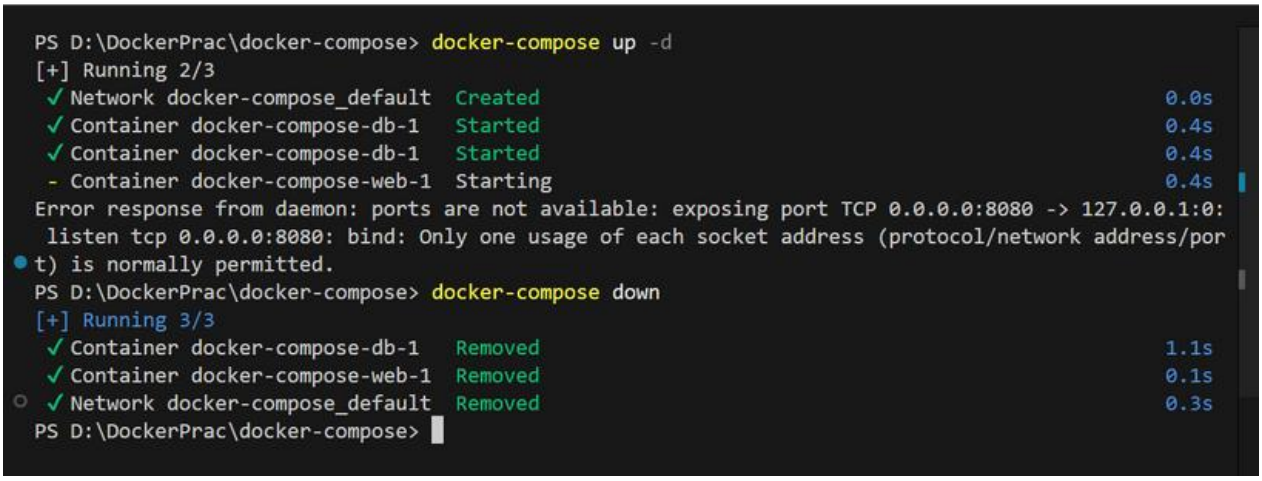

Jenkins / All / New Item
New Item
Enter an item name
MyPipelineJob_120
Select an item type
Freestyle project
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.
Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.
Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.
OK


Jenkins / MyPipelineJob_120 / Configuration
Configure
General
Triggers
Pipeline
Advanced
Pipeline script
Script ?
try sample Pipeline...
stage('Test') {
steps {
echo 'Running tests...'
// yahan test command jaise: sh 'mvn test'
}
}
stage('Deploy') {
steps {
echo 'Deploying application...'
// yahan deploy command jaise: sh 'scp target/*.jar user@server:/deploy/'
}
}
}
}
Save
Apply



17. A Docker Compose file is a YAML configuration file (named docker-compose.yml) used to define and manage multi-container Docker applications. It describes services, networks, and volumes in a single file so that multiple containers can be started, connected, and managed together using simple commands.





18. Demonstrate following docker compose commands:

    a. docker-compose events
    b. docker-compose config
    c. docker-compose images
    d. docker-compose ps
    e. docker-compose pause
    f. docker-compose unpause
    g. docker-compose stop
    h. docker-compose kill

docker-compose > docker-compose.yml

```
1
    ▷Run All Services
2   services:
      ▷Run Service
3     web:
4       image: nginx
5       ports:
6         - "8080:80"
7
      ▷Run Service
8     db:
9       image: mysql:5.7
10      environment:
11        MYSQL_ROOT_PASSWORD: example
12
```

```
PS D:\dockerprac> cd docker-compose
PS D:\dockerprac\docker-compose> docker-compose stop
[+] Stopping 2/2
 ✓ Container docker-compose-db-1   Stopped
 ✓ Container docker-compose-web-1  Stopped
PS D:\dockerprac\docker-compose> docker-compose restart
[+] Restarting 2/2
 ✓ Container docker-compose-web-1  Started
 ✓ Container docker-compose-db-1   Started
PS D:\dockerprac\docker-compose>
```

```
PS D:\DockerPrac\docker-compose> docker-compose events

PS D:\DockerPrac\docker-compose> docker-compose config
name: docker-compose
services:
  db:
    environment:
      MYSQL_ROOT_PASSWORD: example
    image: mysql:5.7
    networks:
      default: null
  web:
    image: nginx
    networks:
      default: null
    ports:
      - mode: ingress
        target: 80
        published: "8080"
        protocol: tcp
networks:
  default:
    name: docker-compose_default
PS D:\DockerPrac\docker-compose>
```

```
PS D:\DockerPrac\docker-compose> docker-compose events
2025-10-13 09:12:13.863619 container start 9a52d214925e224c5d2d87c2fcb75afb0afa2560b311363b752c6243dab9eb1f (image=nginx, desktop.docker.io/ports.scheme=v2, maintainer=NGINX Docker Maintainers <docker-maint@nginx.com>, desktop.docker.io/ports/80/tcp=:8080, name=docker-compose-web-1)

2025-10-13 09:12:13.863839 container restart 9a52d214925e224c5d2d87c2fcb75afb0afa2560b311363b752c6243dab9eb1f (desktop.docker.io/ports/80/tcp=:8080, maintainer=NGINX Docker Maintainers <docker-maint@nginx.com>, name=docker-compose-web-1, desktop.docker.io/ports.scheme=v2, image=nginx)

2025-10-13 09:12:13.904790 container start 8c4f6ceb70c2673febc30d4b467b31aab136b4e769c92d602b7335a1af21bfde (desktop.docker.io/ports.scheme=v2, name=docker-compose-db-1, image=mysql:5.7)

2025-10-13 09:12:13.905064 container restart 8c4f6ceb70c2673febc30d4b467b31aab136b4e769c92d602b7335a1af21bfde (image=mysql:5.7, name=docker-compose-db-1, desktop.docker.io/ports.scheme=v2)

2025-10-13 09:12:14.704595 container die 8c4f6ceb70c2673febc30d4b467b31aab136b4e769c92d602b7335a1af21bfde (name=docker-compose-db-1, desktop.docker.io/ports.scheme=v2, image=mysql:5.7, execDuration=0, exitCode=2)
```

```
PS D:\DockerPrac\docker-compose> docker-compose images
CONTAINER             REPOSITORY          TAG                 PLATFORM            IMAGE ID            SIZE
REATED
docker-compose-db-1   mysql               5.7                 linux/amd64         4bc6bc963e6d        138MB
 minutes ago
docker-compose-web-1  nginx               latest              linux/amd64         d5f28ef21aab        72.3MB
 weeks ago
PS D:\DockerPrac\docker-compose>
```

```
 weeks ago
PS D:\DockerPrac\docker-compose> docker-compose ps
NAME                  IMAGE     COMMAND                  SERVICE   CREATED      STATUS         PORTS
docker-compose-web-1  nginx     "/docker-entrypoint.…"   web       9 days ago   Up 3 minutes   80/tcp
PS D:\DockerPrac\docker-compose>
```

```
PS D:\DockerPrac\docker-compose> docker-compose pause
[+] Pausing 1/1
 ✓ Container docker-compose-web-1  Paused
PS D:\DockerPrac\docker-compose> docker-compose unpause
[+] Running 1/1
 ✓ Container docker-compose-web-1  Unpaused
PS D:\DockerPrac\docker-compose> docker-compose stop
[+] Stopping 2/2
 ✓ Container docker-compose-db-1   Stopped
 ✓ Container docker-compose-web-1  Stopped
PS D:\DockerPrac\docker-compose>
```

```
PS D:\DockerPrac\docker-compose> docker-compose pause
[+] Pausing 1/1
 ✓ Container docker-compose-web-1  Paused
PS D:\DockerPrac\docker-compose> docker-compose unpause
[+] Running 1/1
 ✓ Container docker-compose-web-1  Unpaused
PS D:\DockerPrac\docker-compose> docker-compose stop
[+] Stopping 2/2
 ✓ Container docker-compose-db-1   Stopped
 ✓ Container docker-compose-web-1docker-compose kill
>> D:\DockerPrac\docker-compose>
no container to kill
PS D:\DockerPrac\docker-compose> docker-compose kill
no container to kill
PS D:\DockerPrac\docker-compose> docker-compose ps
NAME      IMAGE     COMMAND   SERVICE   CREATED   STATUS    PORTS
```

19. Create 3 replicas of one image using docker swarm.

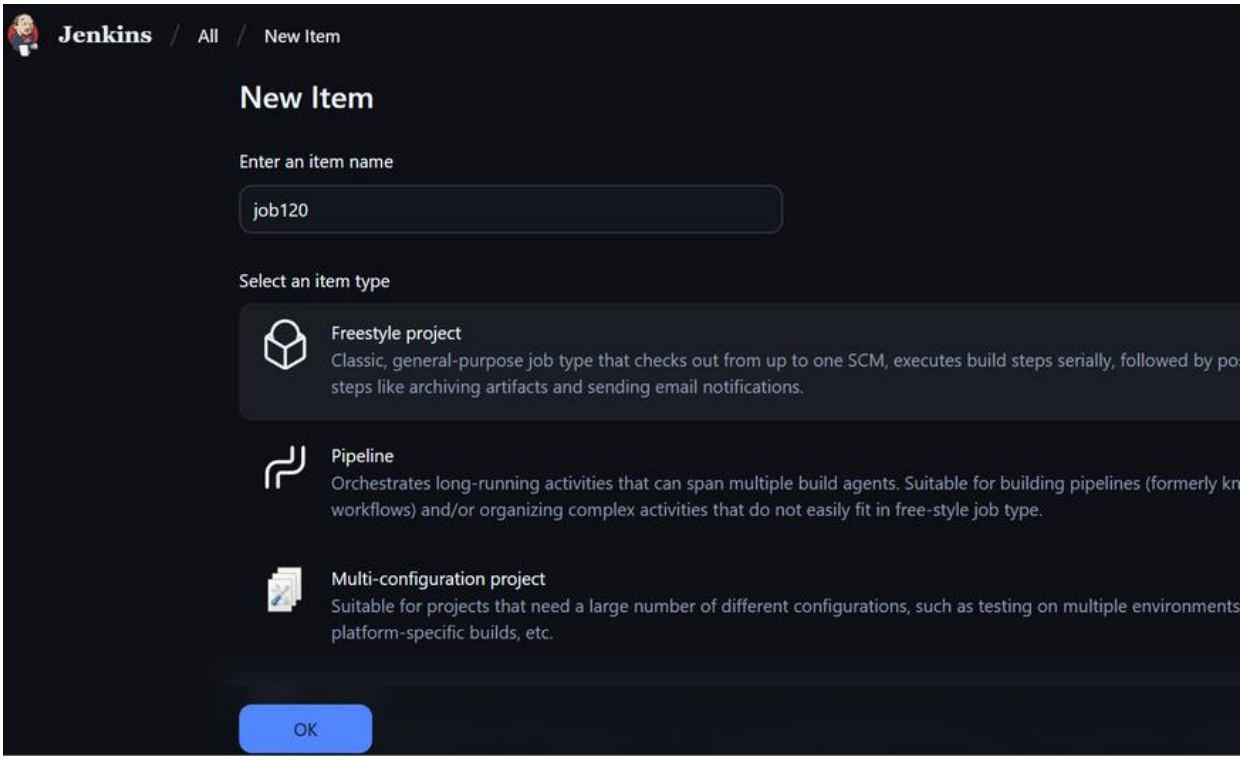
```
PS D:\DockerPrac\docker-compose> docker swarm init
Swarm initialized: current node (iin0zrrul1h9jb9lvkh91v4n4) is now a manager.

To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-6daf50ket1kvdkosdtjb7gkq72978grsu7t60x9kmx5qztzeyn-25aue0p4gjab0vh1dxum7hd7e 192.168.
65.3:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.
PS D:\DockerPrac\docker-compose> docker service create --name myweb --replicas 3 -p 8080:80 nginx
lijf3qx7vpv4s586brizknwmf
overall progress: 3 out of 3 tasks
1/3: running   [==================================================>]
2/3: running   [==================================================>]
3/3: running   [==================================================>]
verify: Service lijf3qx7vpv4s586brizknwmf converged
PS D:\DockerPrac\docker-compose>
```

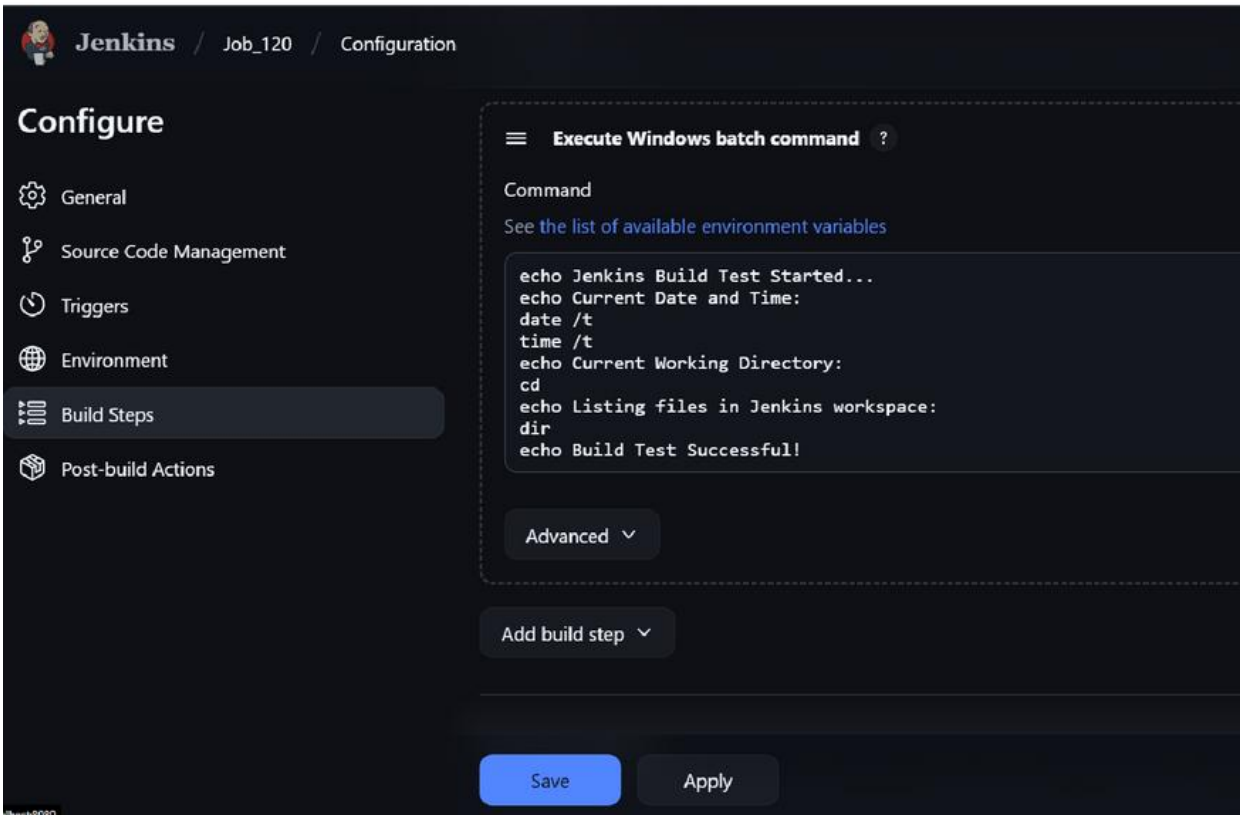
```
PS D:\DockerPrac\docker-compose> docker service create --name myweb --replicas 3 -p 8080:80 nginx
lijf3qx7vpv4s586brizknwmf
overall progress: 3 out of 3 tasks
1/3: running   [==================================================>]
2/3: running   [==================================================>]
3/3: running   [==================================================>]
verify: Service lijf3qx7vpv4s586brizknwmf converged
PS D:\DockerPrac\docker-compose> docker service ls
ID             NAME      MODE         REPLICAS   IMAGE          PORTS
lijf3qx7vpv4   myweb     replicated   3/3        nginx:latest   *:8080->80/tcp
PS D:\DockerPrac\docker-compose> docker service ps myweb
ID             NAME      IMAGE          NODE             DESIRED STATE   CURRENT STATE            ERROR     PORTS
owyx3i16z28v   myweb.1   nginx:latest   docker-desktop   Running         Running 47 seconds ago
b86yxv9x07jy   myweb.2   nginx:latest   docker-desktop   Running         Running 46 seconds ago
jq3u90p6em2j   myweb.3   nginx:latest   docker-desktop   Running         Running 47 seconds ago
```

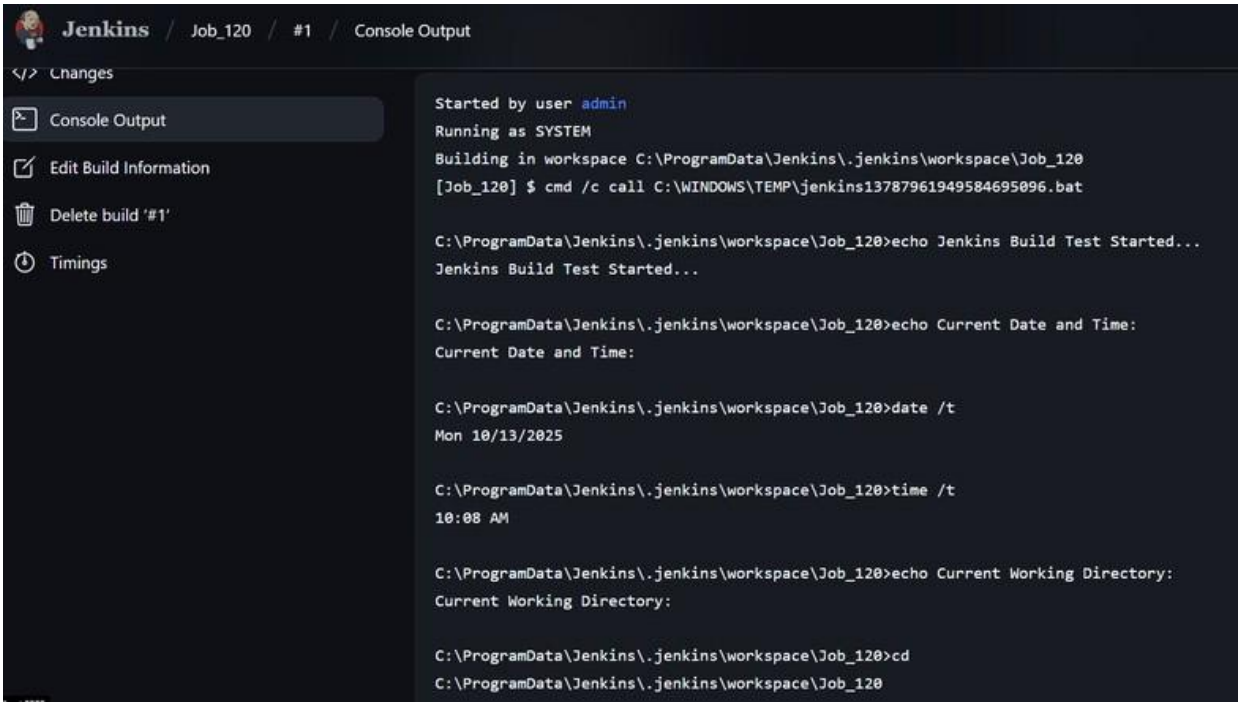
```
PS D:\DockerPrac\docker-compose> docker service scale myweb=5
myweb scaled to 5
overall progress: 5 out of 5 tasks
1/5: running   [==================================================>]
2/5: running   [==================================================>]
3/5: running   [==================================================>]
4/5: running   [==================================================>]
5/5: running   [==================================================>]
verify: Service myweb converged
PS D:\DockerPrac\docker-compose> docker service ps myweb
ID             NAME      IMAGE          NODE             DESIRED STATE   CURRENT STATE               ERROR     PORTS
owyx3i16z28v   myweb.1   nginx:latest   docker-desktop   Running         Running 2 minutes ago
b86yxv9x07jy   myweb.2   nginx:latest   docker-desktop   Running         Running 2 minutes ago
jq3u90p6em2j   myweb.3   nginx:latest   docker-desktop   Running         Running 2 minutes ago
n2xjpvr4p7u2   myweb.4   nginx:latest   docker-desktop   Running         Running about a minute ago
8ccu8noe70m4   myweb.5   nginx:latest   docker-desktop   Running         Running about a minute ago
PS D:\DockerPrac\docker-compose>
```

```
PS D:\DockerPrac\docker-compose> docker service rm myweb
myweb
PS D:\DockerPrac\docker-compose>
```

JENKINS


Jenkins / All / New Item
New Item
Enter an item name
job120
Select an item type
Freestyle project
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by po
steps like archiving artifacts and sending email notifications.
Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly kn
workflows) and/or organizing complex activities that do not easily fit in free-style job type.
Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments
platform-specific builds, etc.
OK


Jenkins / Job_120 / Configuration
Configure
General
Source Code Management
Triggers
Environment
Build Steps
Post-build Actions
Execute Windows batch command
Command
See the list of available environment variables
echo Jenkins Build Test Started...
echo Current Date and Time:
date /t
time /t
echo Current Working Directory:
cd
echo Listing files in Jenkins workspace:
dir
echo Build Test Successful!
Advanced
Add build step
Save
Apply


Jenkins / Job_120 / #1 / Console Output
Changes
Console Output
Edit Build Information
Delete build '#1'
Timings
Started by user admin
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\.jenkins\workspace\Job_120
[Job_120] $ cmd /c call C:\WINDOWS\TEMP\jenkins13787961949584695096.bat
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120>echo Jenkins Build Test Started...
Jenkins Build Test Started...
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120>echo Current Date and Time:
Current Date and Time:
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120>date /t
Mon 10/13/2025
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120>time /t
10:08 AM
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120>echo Current Working Directory:
Current Working Directory:
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120>cd
C:\ProgramData\Jenkins\.jenkins\workspace\Job_120