



# Container Orchestration and Security

## ASSIGNMENT – 1

SESSION: January 2026 – May 2026

**SUBMITTED TO-**

Dr. Hitesh Kumar Sharma

**SUBMITTED BY –**

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SAP ID: 500123468

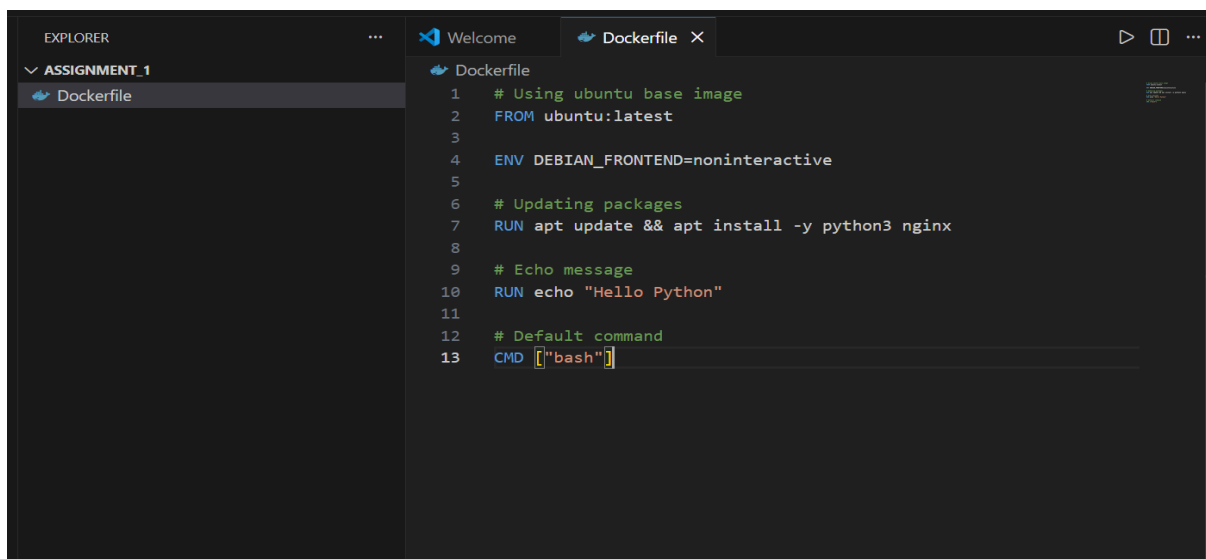
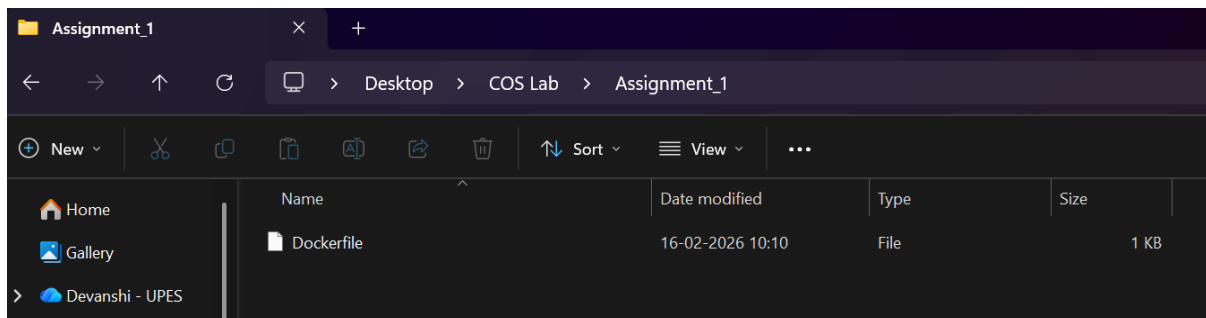
ROLL NO.: R2142230278

Batch : 01 DevOps

SEMESTER: 6<sup>th</sup>

## Q. Implement the following Scenario in Docker

1. Create a Dockerfile
2. Pull an Ubuntu image in it.
3. Install python in it.
4. Echo a message “Hello Python”
5. Install Nginx server in it.
6. Build an image of this Dockerfile named as “your roll number”
7. Push that image on Docker Hub
8. Pull that image from Docker Hub
9. Run a container from this image
10. Create volume MyDvol for this container.
11. Create a file in this volume with a text message “Hello MyDvol”



```
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker pull ubuntu:latest
latest: Pulling from library/ubuntu
a3629ac5b9f4: Pull complete
Digest: sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
mysql                latest             932fe8fbc04c       2 weeks ago        1.25GB
nginx-html-app       latest             5e84d56148aa       3 weeks ago        237MB
wordpress            latest             afa48d92726d       4 weeks ago        1.05GB
ubuntu               latest             cd1dba651b30       4 weeks ago        117MB
nginx                latest             c881927c4077       4 weeks ago        237MB
sreyassharma/signed_images_jenkins 1.0.1             9f728814bd33       3 months ago       80.1MB
demo_app_try         latest             7790fc7a40b3       3 months ago       80.1MB
jasonish/suricata    latest             fc6cce7683d2       3 months ago       594MB
ghcr.io/zaproxy/zaproxy stable             84d2459dc305       3 months ago       3.58GB
alpine               latest             4b7ce07002c6       4 months ago       12.8MB
hello-world          latest             f7931603f70e       6 months ago       20.3kB
docker/desktop-kubernetes kubernetes-v1.32.2-cni-v1.6.0-critools-v1.31.1-cri-dockerd-v0.3.16-1-debian fdd1722efdec       12 months ago       596MB
registry.k8s.io/kube-apiserver v1.32.2           c47449f3e751       12 months ago       129MB
registry.k8s.io/kube-controller-manager v1.32.2          399aa50f4d13       12 months ago       119MB
registry.k8s.io/kube-proxy v1.32.2           83c025f9faa6       12 months ago       129MB
registry.k8s.io/kube-scheduler v1.32.2           45710d74cf5d       12 months ago       93.5MB
envoyproxy/envoy     v1.32.0           071ae2096452       16 months ago       224MB
kindest/node          v1.31.1           cd224d8da58d       16 months ago       1.49GB
busybox               latest            2383baad1860       16 months ago       6.78MB
registry.k8s.io/etcd 3.5.16-0         c6a9d11cc5c0       17 months ago       211MB
docker/desktop-cloud-provider-kind v0.3.0-desktop.3 c321a5c92549       17 months ago       582MB
docker/desktop-containerd-registry-mirror v0.0.2           aadc48ce8960       18 months ago       46.4MB
registry.k8s.io/coredns/coredns v1.11.3          9caabf6e230b       18 months ago       85.1MB
hkshitesh/kubedemo   2.0              a21f8e748696       19 months ago       59.4MB
hkshitesh/kubedemo   1.0              eddef5e77713       19 months ago       59.4MB
registry.k8s.io/pause 3.10             ee6521f290b2       21 months ago       1.06MB
docker/desktop-vpnkit-controller dc313cb22850be0cdd97c84a9cfecaf44a1afb6e 7ecf567ea070       2 years ago       47MB
kubernetesui/dashboard v2.7.0           2e580d29e9d5       3 years ago       334MB
kubernetesui/metrics-scraper v1.0.8           76049887f07a       3 years ago       63.6MB
docker/desktop-storage-provisioner v2.0             115d77efe6e2       4 years ago       59.2MB
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1>
```

```
Windows PowerShell
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker build -t r2142230278 .
[+] Building 95.9s (9/7) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 271B
=> [internal] load metadata for docker.io/library/ubuntu:latest
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/3] FROM docker.io/library/ubuntu:latest@sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
=> resolve docker.io/library/ubuntu:latest@sha256:cd1dba651b3080c3686ecf4e3c4220f026b521fb76978881737d24f200828b2b
=> [2/3] RUN apt update && apt install -y python3 nginx
=> [3/3] RUN echo "Hello Python"
=> exporting to image
=> => exporting layers
=> => exporting manifest sha256:87e49ac2b1c95e7403b1db21f383e822eac5f29ba6b4736a8ab7f8953c237879
=> => exporting config sha256:642a6d8928ddfcfe020d690d284f40b3322d2987c1a430e0e5cf02ddb36651
=> => exporting attestation manifest sha256:7b5f56b5316608e258fc50ca08a2e9c9d20bc2d49d7f4b4b789c3d4dd4128
=> => exporting manifest list sha256:7b5f56b5316608e258fc50ca08a2e9c9d20bc2d49d7f4b4b789c3d4dd4128
=> => naming to docker.io/library/r2142230278:latest
=> => unpacking to docker.io/library/r2142230278:latest

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/rwmpz1qmc4gkusu29nnvne8v6r
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
r2142230278         latest             7bf4d56b53166     12 seconds ago     294MB
mysql                latest             932fe8fbc04c       2 weeks ago        1.25GB
nginx-html-app       latest             5e84d56148aa       3 weeks ago        237MB
wordpress            latest             afa48d92726d       4 weeks ago        1.05GB
ubuntu               latest             cd1dba651b30       4 weeks ago        117MB
nginx                latest             c881927c4077       4 weeks ago        237MB
demo_app_try         latest             7790fc7a40b3       3 months ago       80.1MB
sreyassharma/signed_images_jenkins 1.0.1             9f728814bd33       3 months ago       80.1MB
jasonish/suricata    latest             fc6cce7683d2       3 months ago       594MB
ghcr.io/zaproxy/zaproxy stable             84d2459dc305       3 months ago       3.58GB
alpine               latest             4b7ce07002c6       4 months ago       12.8MB
hello-world          latest             f7931603f70e       6 months ago       20.3kB
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registry.k8s.io/kube-apiserver v1.32.2           c47449f3e751       12 months ago       129MB
registry.k8s.io/kube-proxy v1.32.2           83c025f9faa6       12 months ago       129MB
registry.k8s.io/kube-controller-manager v1.32.2          399aa50f4d13       12 months ago       119MB
registry.k8s.io/kube-scheduler v1.32.2           45710d74cf5d       12 months ago       93.5MB
envoyproxy/envoy     v1.32.0           071ae2096452       16 months ago       224MB
kindest/node          v1.31.1           cd224d8da58d       16 months ago       1.49GB
busybox               latest            2383baad1860       16 months ago       6.78MB
registry.k8s.io/etcd 3.5.16-0         c6a9d11cc5c0       17 months ago       211MB
docker/desktop-cloud-provider-kind v0.3.0-desktop.3 c321a5c92549       17 months ago       582MB
docker/desktop-containerd-registry-mirror v0.0.2           aadc48ce8960       18 months ago       46.4MB
registry.k8s.io/coredns/coredns v1.11.3          9caabf6e230b       18 months ago       85.1MB
hkshitesh/kubedemo   2.0              a21f8e748696       19 months ago       59.4MB
hkshitesh/kubedemo   1.0              eddef5e77713       19 months ago       59.4MB
registry.k8s.io/pause 3.10             ee6521f290b2       21 months ago       1.06MB
docker/desktop-vpnkit-controller dc313cb22850be0cdd97c84a9cfecaf44a1afb6e 7ecf567ea070       2 years ago       47MB
kubernetesui/dashboard v2.7.0           2e580d29e9d5       3 years ago       334MB
kubernetesui/metrics-scraper v1.0.8           76049887f07a       3 years ago       63.6MB
docker/desktop-storage-provisioner v2.0             115d77efe6e2       4 years ago       59.2MB

Windows PowerShell
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker login
Authenticating with existing credentials... [Username: devanshi@4ain]

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

Login Succeeded
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker tag r2142230278 devanshi@4ain/r2142230278
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
devanshi@4ain/r2142230278 latest             7bf4d56b53166     About a minute ago 294MB
r2142230278         latest             7bf4d56b53166     About a minute ago 294MB
mysql                latest             932fe8fbc04c       2 weeks ago        1.25GB
nginx-html-app       latest             5e84d56148aa       3 weeks ago        237MB
wordpress            latest             afa48d92726d       4 weeks ago        1.05GB
ubuntu               latest             cd1dba651b30       4 weeks ago        117MB
nginx                latest             c881927c4077       4 weeks ago        237MB
demo_app_try         latest             7790fc7a40b3       3 months ago       80.1MB
sreyassharma/signed_images_jenkins 1.0.1             9f728814bd33       3 months ago       80.1MB
jasonish/suricata    latest             fc6cce7683d2       3 months ago       594MB
ghcr.io/zaproxy/zaproxy stable             84d2459dc305       3 months ago       3.58GB
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hello-world          latest             f7931603f70e       6 months ago       20.3kB
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registry.k8s.io/kube-proxy v1.32.2           83c025f9faa6       12 months ago       129MB
registry.k8s.io/kube-scheduler v1.32.2           45710d74cf5d       12 months ago       93.5MB
envoyproxy/envoy     v1.32.0           071ae2096452       16 months ago       224MB
kindest/node          v1.31.1           cd224d8da58d       16 months ago       1.49GB
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registry.k8s.io/coredns/coredns v1.11.3          9caabf6e230b       18 months ago       85.1MB
hkshitesh/kubedemo   2.0              a21f8e748696       19 months ago       59.4MB
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kubernetesui/dashboard v2.7.0           2e580d29e9d5       3 years ago       334MB
kubernetesui/metrics-scraper v1.0.8           76049887f07a       3 years ago       63.6MB
docker/desktop-storage-provisioner v2.0             115d77efe6e2       4 years ago       59.2MB
```

```
Windows PowerShell X + v

PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker push devanshij04ain/r2142230278
Using default tag: latest
The push refers to repository [docker.io/devanshij04ain/r2142230278]
7c50a20fdd96: Pushed
4f4fb700ef54: Mounted from library/wordpress
a3629ac5b9f4: Mounted from library/ubuntu
41d1dde4aaba: Pushed
latest: digest: sha256:7bfd56b5316608e258fc50ca00a2e9c09d20bc2d49d7827fd4b709cc3ddd4128 size: 855
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker pull devanshij04ain/r2142230278
Using default tag: latest
latest: Pulling from devanshij04ain/r2142230278
Digest: sha256:7bfd56b5316608e258fc50ca00a2e9c09d20bc2d49d7827fd4b709cc3ddd4128
Status: Image is up to date for devanshij04ain/r2142230278:latest
docker.io/devanshij04ain/r2142230278:latest

PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker run -it --name mycontainer devanshij04ain/r2142230278
root@9dd561589b1a:/# python3 --version
Python 3.12.3
root@9dd561589b1a:/# nginx -v
nginx version: nginx/1.24.0 (Ubuntu)
root@9dd561589b1a:/# exit
exit
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker volume create MyDvol
MyDvol
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker volume ls
DRIVER      VOLUME NAME
local       0faeb2f7d30e0647db36f64a6546cfa8252e07a7c7a3b0834c9f855e6c407e5f
local       11b3ac6e713306f7b186383ea2470d737ef47213b5baa2ac840691a667c5c8ac
local       MyDvol
local       f7eb6786fb6714c03495bfbcc412a062355e3362cf98259db58f53acc3618f196
local       fa4f109ce31a400e40f05c0308f7630f3e2a78b8d48377bf152a31c04b477752
local       lab_6_db_data

PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker run -it --name volcontainer -v MyDvol:/data devanshij04ain/r2142230278
root@76c2b0131b15:/# cd /data
root@76c2b0131b15:/data# echo "Hello MyDvol" > myfile.txt
root@76c2b0131b15:/data# cat myfile.txt
Hello MyDvol
root@76c2b0131b15:/data# exit
exit
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker ps -a
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES
76c2b0131b15   devanshij04ain/r2142230278          "bash"                 2 minutes ago   Exited (0)    About a minute ago         volcontainer
9dd561589b1a   devanshij04ain/r2142230278          "bash"                 8 minutes ago   Exited (0)    8 minutes ago             mycontainer

PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker rm mycontainer
mycontainer
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker rm volcontainer
volcontainer
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker rmi r2142230278
Untagged: r2142230278:latest
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> docker rmi devanshij04ain/r2142230278
Untagged: devanshij04ain/r2142230278:latest
Deleted: sha256:7bfd56b5316608e258fc50ca00a2e9c09d20bc2d49d7827fd4b709cc3ddd4128
PS C:\Users\Devanshi\Desktop\COS_Lab\Assignment_1> |
```