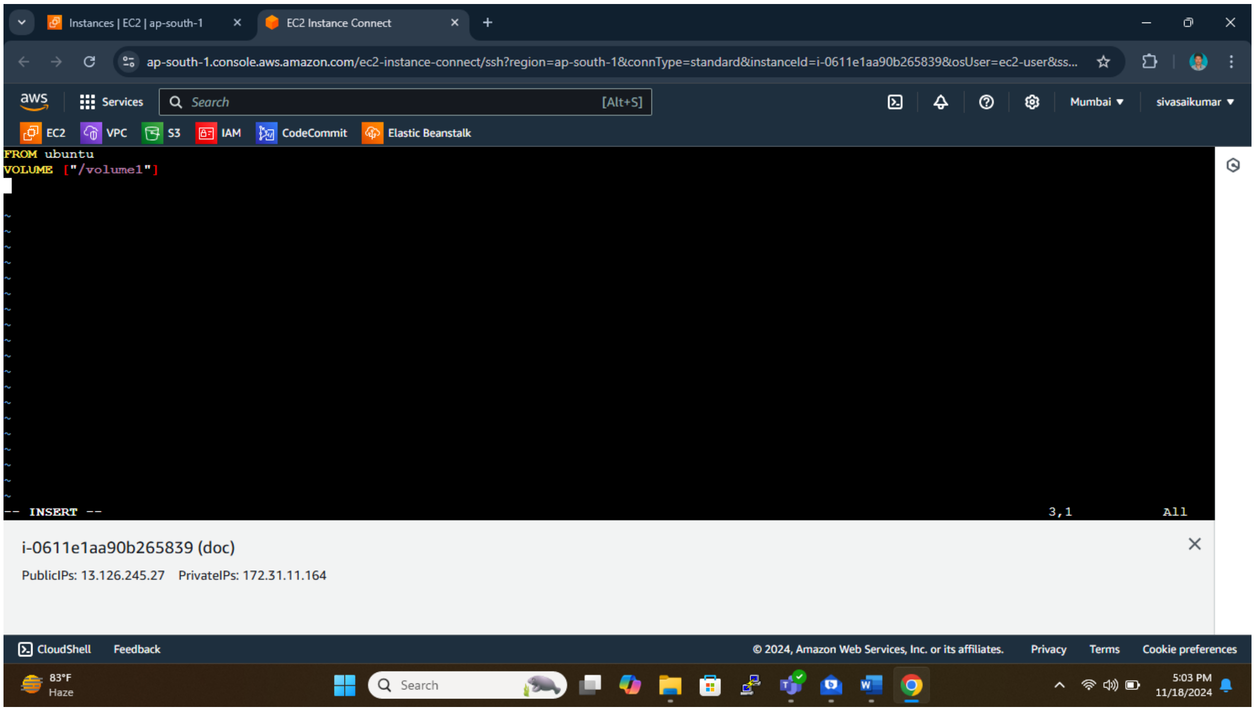
CREATION OF VOLUMES IN DOCKER

To create volumes in a docker there are 3 ways we:

1) **Using the Dockerfile**
2) **Create a volume will create a container using command**
3) **Creating a local volume and mount it to the container**

1) using the Dockerfile:

To create a volume using a Dockerfile is a method in which we create Dockerfile and build it as an image using that image creating a container, In the Dockerfile using components we can create a volume always remember that in Dockerfile starting letter 'd' will be always upper case.



Instances | EC2 | ap-south-1
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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```
FROM ubuntu
VOLUME ["/volume1"]

-- INSERT --                                              3,1           All
```

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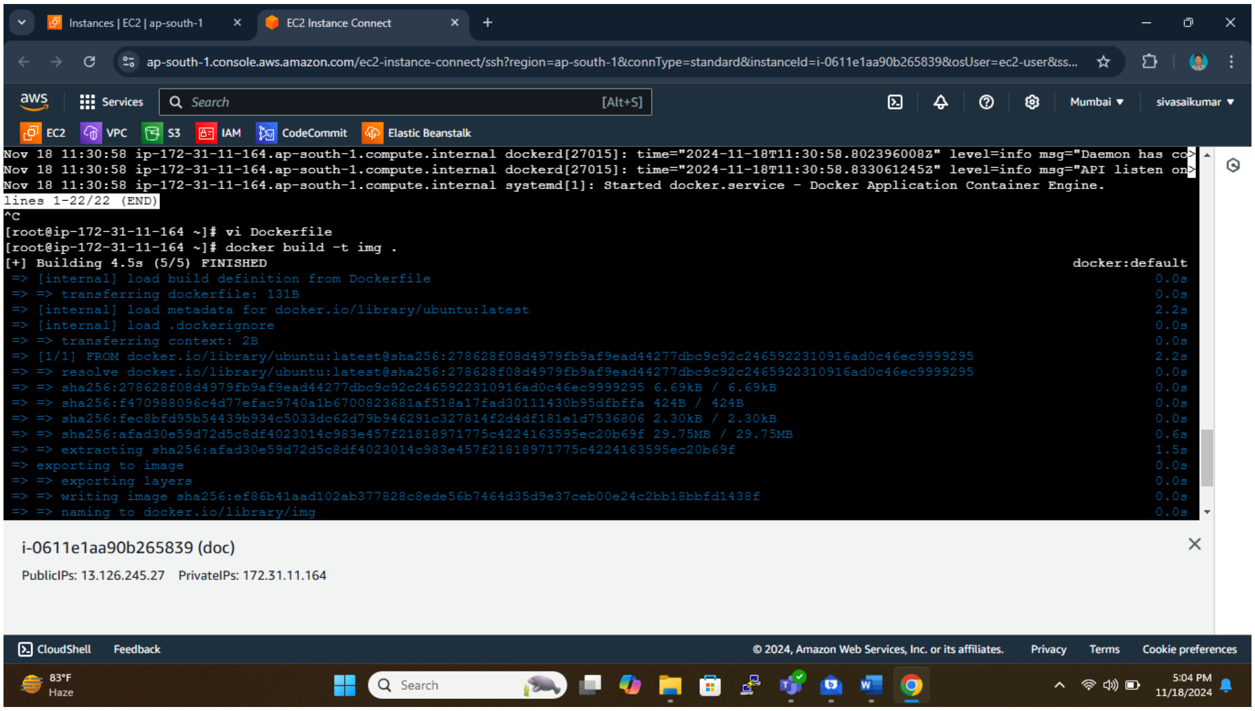
The above image is the script of Dockerfile description of components:

FROM: it is main component in Dockerfile using this only the image will be built

VOLUME: it is component that is used to create a volume will create a container after this component the name of the container will be provide in ["/*"] place of star

After creating this file execute this command to build the image using that file

docker build -t img .



```
Nov 18 11:30:58 ip-172-31-11-164.ap-south-1.compute.internal dockerd[27015]: time="2024-11-18T11:30:58.802396008Z" level=info msg="Daemon has co>
Nov 18 11:30:58 ip-172-31-11-164.ap-south-1.compute.internal dockerd[27015]: time="2024-11-18T11:30:58.833061245Z" level=info msg="API listen on>
Nov 18 11:30:58 ip-172-31-11-164.ap-south-1.compute.internal systemd[1]: Started docker.service - Docker Application Container Engine.
lines 1-22/22 (END)
^C
[root@ip-172-31-11-164 ~]# vi Dockerfile
[root@ip-172-31-11-164 ~]# docker build -t img .
[+] Building 4.5s (5/5) FINISHED                                                                                    docker:default
 => [internal] load build definition from Dockerfile                                                                          0.0s
 => => transferring dockerfile: 131B                                                                                          0.0s
 => [internal] load metadata for docker.io/library/ubuntu:latest                                                              2.2s
 => [internal] load .dockerignore                                                                                             0.0s
 => => transferring context: 2B                                                                                               0.0s
 => [1/1] FROM docker.io/library/ubuntu:latest@sha256:278628f08d4979fb9af9ead44277dbc9c92c2465922310916ad0c46ec9999295         2.2s
 => => resolve docker.io/library/ubuntu:latest@sha256:278628f08d4979fb9af9ead44277dbc9c92c2465922310916ad0c46ec9999295         0.0s
 => => sha256:278628f08d4979fb9af9ead44277dbc9c92c2465922310916ad0c46ec9999295 6.69kB / 6.69kB                                0.0s
 => => sha256:f470988096c4d77efac9740a1b67008236 81af518a17fad30111430b95dfbffa 424B / 424B                                    0.0s
 => => sha256:fec8bfd95b54439b934c5033dc62d79b946291c327814f2d4df181e1d7536806 2.30kB / 2.30kB                                0.0s
 => => sha256:afad30e59d72d5c8df4023014c983e457f21818971775c4224163595ec20b69f 29.75MB / 29.75MB                              0.6s
 => => extracting sha256:afad30e59d72d5c8df4023014c983e457f21818971775c4224163595ec20b69f                                      1.5s
 => exporting to image                                                                                                        0.0s
 => => exporting layers                                                                                                       0.0s
 => => writing image sha256:ef86b41aad102ab377828c8ede56b7464d35d9e37ceb00e24c2bb18bbfd1438f                                  0.0s
 => => naming to docker.io/library/img                                                                                        0.0s
```

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ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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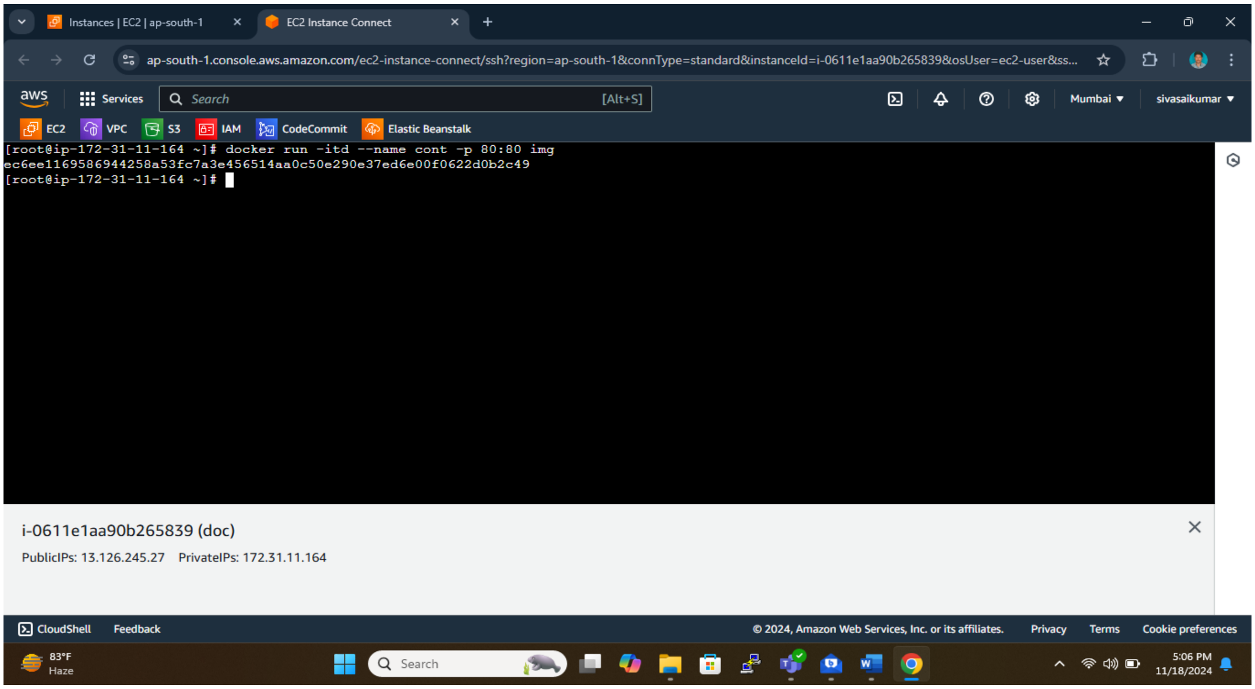
Now create container using the newly created image by execute this command

docker run -itd –name cont -p 80:80 img



```
[root@ip-172-31-11-164 ~]# docker run -itd --name cont -p 80:80 img
ec6ee1169586944258a53fc7a3e456514aa0c50e290e37ed6e00f0622d0b2c49
[root@ip-172-31-11-164 ~]# 
```

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Instances | EC2 | ap-south-1
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ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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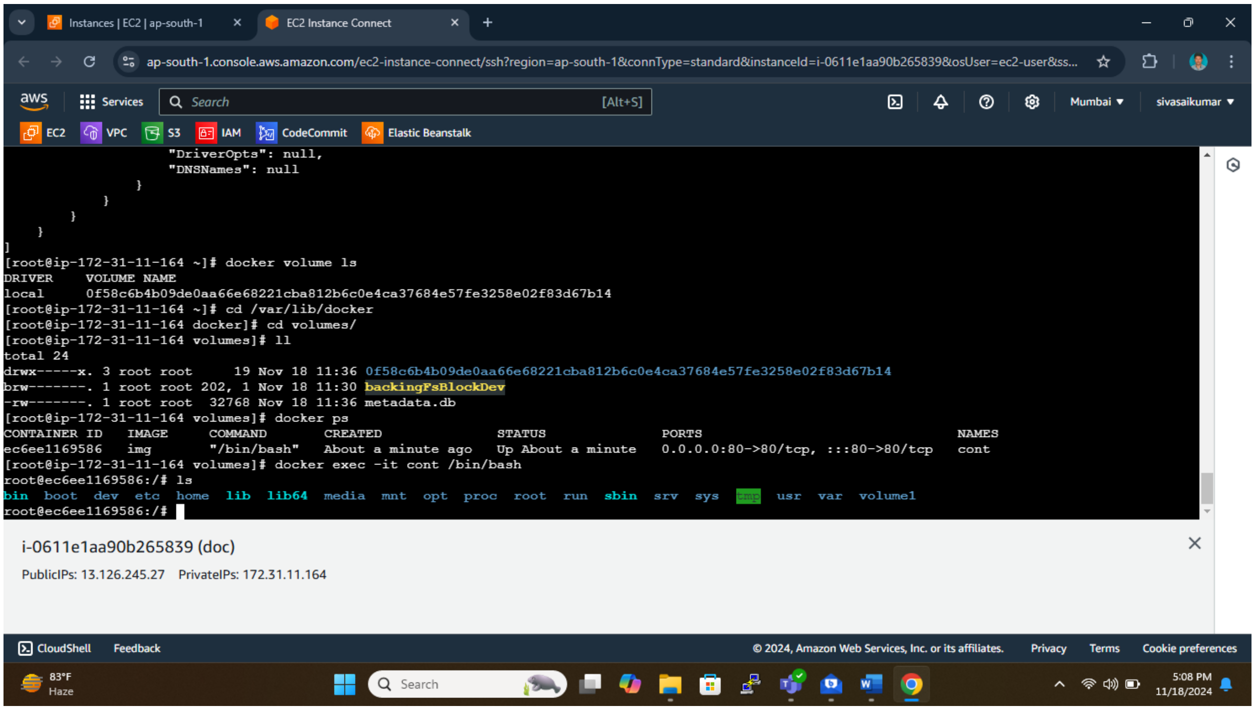
now go in to the container using exec command and go to root directory there use the command ‘ls’ you will see the created volume as a directory as shown in the below image


Instances | EC2 | ap-south-1
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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```
                    "DriverOpts": null,
                    "DNSNames": null
                }
            }
        }
    }
]
[root@ip-172-31-11-164 ~]# docker volume ls
DRIVER    VOLUME NAME
local     0f58c6b4b09de0aa66e68221cba812b6c0e4ca37684e57fe3258e02f83d67b14
[root@ip-172-31-11-164 ~]# cd /var/lib/docker
[root@ip-172-31-11-164 docker]# cd volumes/
[root@ip-172-31-11-164 volumes]# ll
total 24
drwx-----x. 3 root root     19 Nov 18 11:36 0f58c6b4b09de0aa66e68221cba812b6c0e4ca37684e57fe3258e02f83d67b14
brw-------. 1 root root 202, 1 Nov 18 11:30 backingFsBlockDev
-rw-------. 1 root root  32768 Nov 18 11:36 metadata.db
[root@ip-172-31-11-164 volumes]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED              STATUS              PORTS                                 NAMES
ec6ee1169586   img       "/bin/bash"   About a minute ago   Up About a minute   0.0.0.0:80->80/tcp, :::80->80/tcp   cont
[root@ip-172-31-11-164 volumes]# docker exec -it cont /bin/bash
root@ec6ee1169586:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var  volume1
root@ec6ee1169586:/#
```

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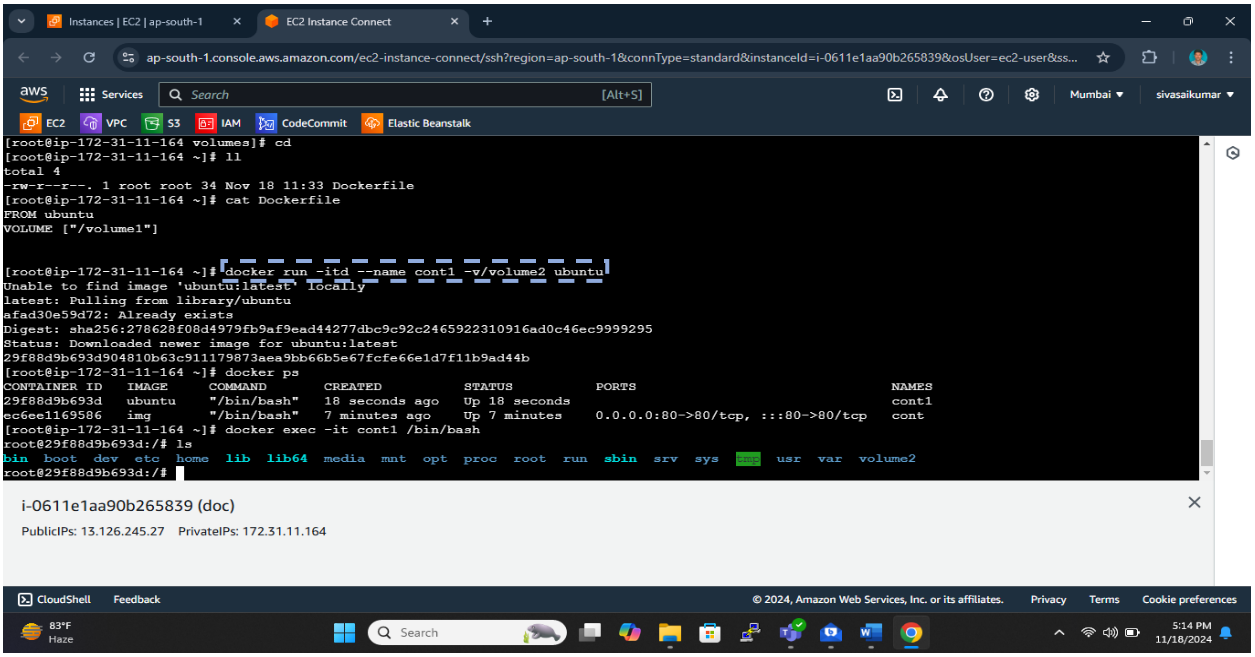
2) Create a volume will create a container using commands:

In this method we use a simple command to create a volume using any of the required base image


Instances | EC2 | ap-south-1
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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```
[root@ip-172-31-11-164 volumes]# cd
[root@ip-172-31-11-164 ~]# ll
total 4
-rw-r--r--. 1 root root 34 Nov 18 11:33 Dockerfile
[root@ip-172-31-11-164 ~]# cat Dockerfile
FROM ubuntu
VOLUME ["/volume1"]


[root@ip-172-31-11-164 ~]# docker run -itd --name cont1 -v/volume2 ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
afad30e59d72: Already exists
Digest: sha256:278628f08d4979fb9af9ead44277dbc9c92c2465922310916ad0c46ec9999295
Status: Downloaded newer image for ubuntu:latest
29f88d9b693d904810b63c911179873aea9bb66b5e67fcfe66e1d7f11b9ad44b
[root@ip-172-31-11-164 ~]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS          PORTS                                 NAMES
29f88d9b693d   ubuntu    "/bin/bash"   18 seconds ago   Up 18 seconds                                         cont1
ec6ee1169586   img       "/bin/bash"   7 minutes ago    Up 7 minutes    0.0.0.0:80->80/tcp, :::80->80/tcp   cont
[root@ip-172-31-11-164 ~]# docker exec -it cont1 /bin/bash
root@29f88d9b693d:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var  volume2
root@29f88d9b693d:/#
```

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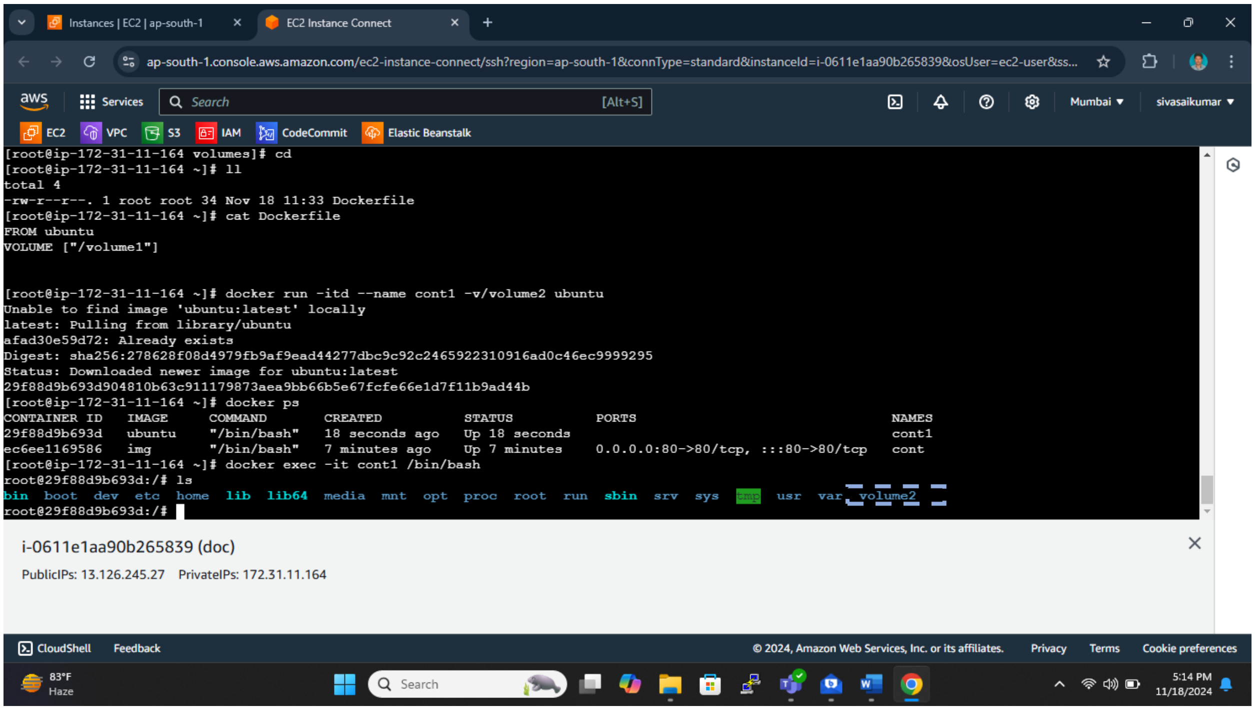
Docker run -itd –name cont1 -v/volume2 unbuntu

after executing the above command go in to the container using exec command and go to root directory there use the command ‘ls’ you will see the created volume as a directory as shown in the below image


Instances | EC2 | ap-south-1
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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```
[root@ip-172-31-11-164 volumes]# cd
[root@ip-172-31-11-164 ~]# ll
total 4
-rw-r--r--. 1 root root 34 Nov 18 11:33 Dockerfile
[root@ip-172-31-11-164 ~]# cat Dockerfile
FROM ubuntu
VOLUME ["/volume1"]


[root@ip-172-31-11-164 ~]# docker run -itd --name cont1 -v/volume2 ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
afad30e59d72: Already exists
Digest: sha256:278628f08d4979fb9af9ead44277dbc9c92c2465922310916ad0c46ec9999295
Status: Downloaded newer image for ubuntu:latest
29f88d9b693d904810b63c911179873aea9bb66b5e67fcfe66e1d7f11b9ad44b
[root@ip-172-31-11-164 ~]# docker ps
CONTAINER ID   IMAGE     COMMAND       CREATED          STATUS          PORTS                               NAMES
29f88d9b693d   ubuntu    "/bin/bash"   18 seconds ago   Up 18 seconds                                       cont1
ec6ee1169586   img       "/bin/bash"   7 minutes ago    Up 7 minutes    0.0.0.0:80->80/tcp, :::80->80/tcp   cont
[root@ip-172-31-11-164 ~]# docker exec -it cont1 /bin/bash
root@29f88d9b693d:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var  volume2
root@29f88d9b693d:/#
```

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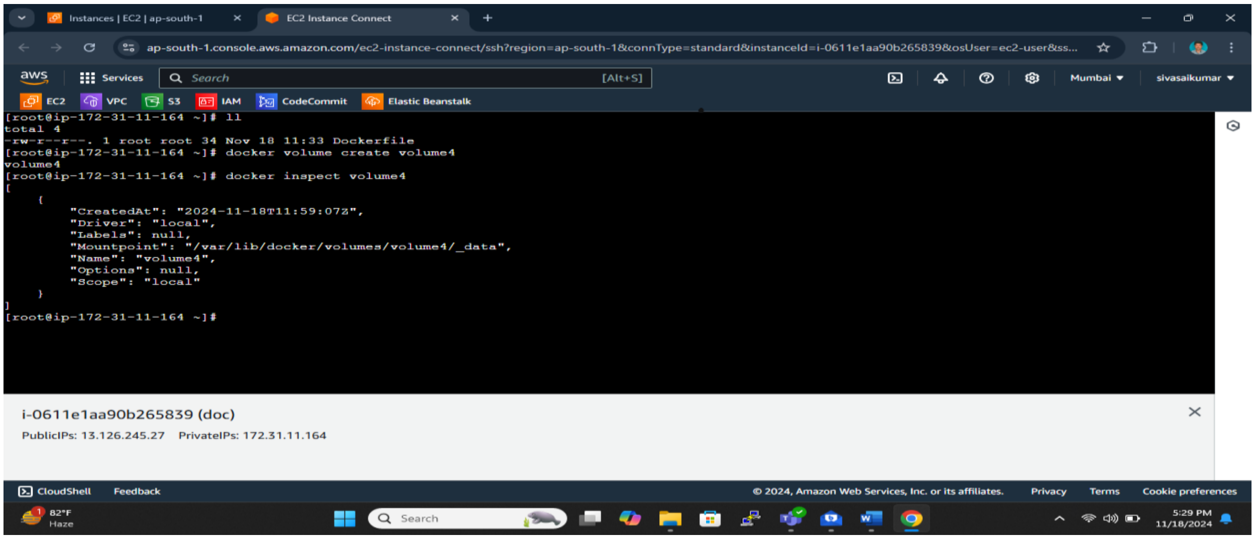
3) Creating a local volume and mount it to the container:

In this method first we create a local volume using the command

docker volume create volume 4


Instances | EC2 | ap-south-1
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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```
[root@ip-172-31-11-164 ~]# ll
total 4
-rw-r--r--. 1 root root 34 Nov 18 11:33 Dockerfile
[root@ip-172-31-11-164 ~]# docker volume create volume4
volume4
[root@ip-172-31-11-164 ~]# docker inspect volume4
[
    {
        "CreatedAt": "2024-11-18T11:59:07Z",
        "Driver": "local",
        "Labels": null,
        "Mountpoint": "/var/lib/docker/volumes/volume4/_data",
        "Name": "volume4",
        "Options": null,
        "Scope": "local"
    }
]
[root@ip-172-31-11-164 ~]#
```

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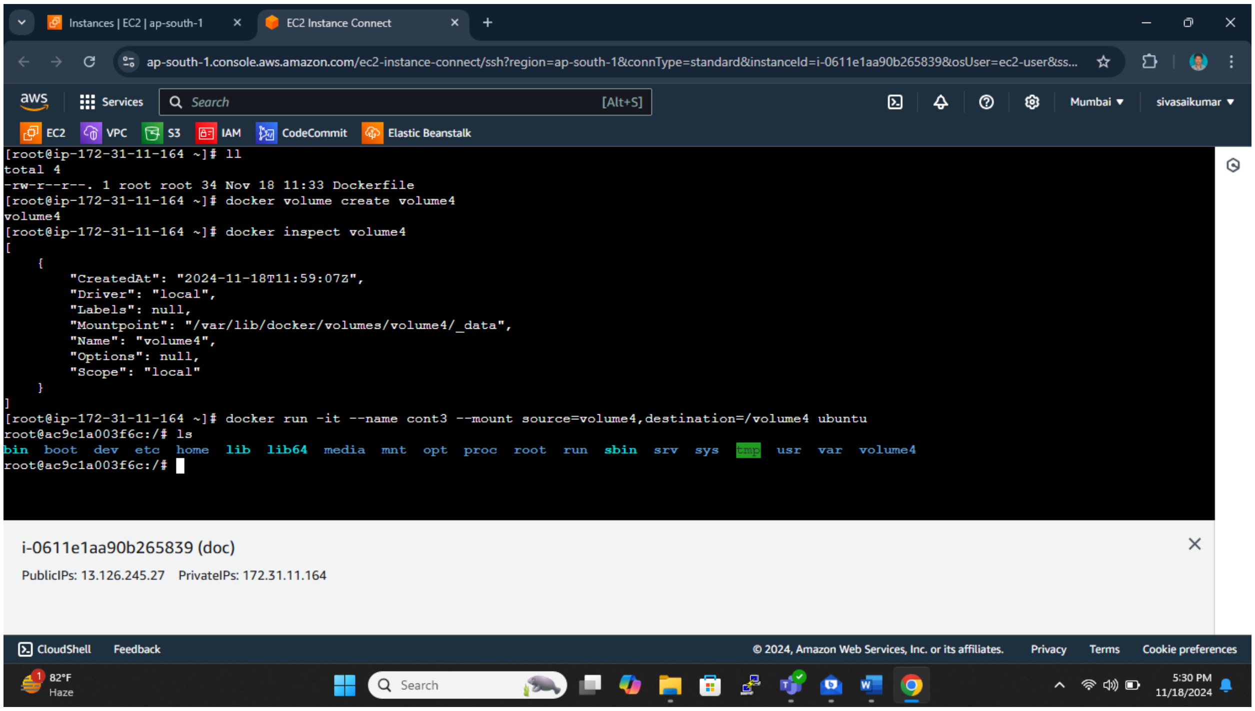
After that execute the below command to mount the created volume and to create container.

docker run –itd –name cont3 --mount source=volume4,destination=/volume4 ubuntu

after executing the above command go in to the container using exec command and go to root directory there use the command 'ls' you will see the created volume as a directory as shown in the below image


Instances | EC2 | ap-south-1
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0611e1aa90b265839&osUser=ec2-user&ss...
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```
[root@ip-172-31-11-164 ~]# ll
total 4
-rw-r--r--. 1 root root 34 Nov 18 11:33 Dockerfile
[root@ip-172-31-11-164 ~]# docker volume create volume4
volume4
[root@ip-172-31-11-164 ~]# docker inspect volume4
[
    {
        "CreatedAt": "2024-11-18T11:59:07Z",
        "Driver": "local",
        "Labels": null,
        "Mountpoint": "/var/lib/docker/volumes/volume4/_data",
        "Name": "volume4",
        "Options": null,
        "Scope": "local"
    }
]
[root@ip-172-31-11-164 ~]# docker run -it --name cont3 --mount source=volume4,destination=/volume4 ubuntu
root@ac9c1a003f6c:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var  volume4
root@ac9c1a003f6c:/#
```

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