

# Module - 10

## Container Orchestration Tool - Kubernetes: Assignment

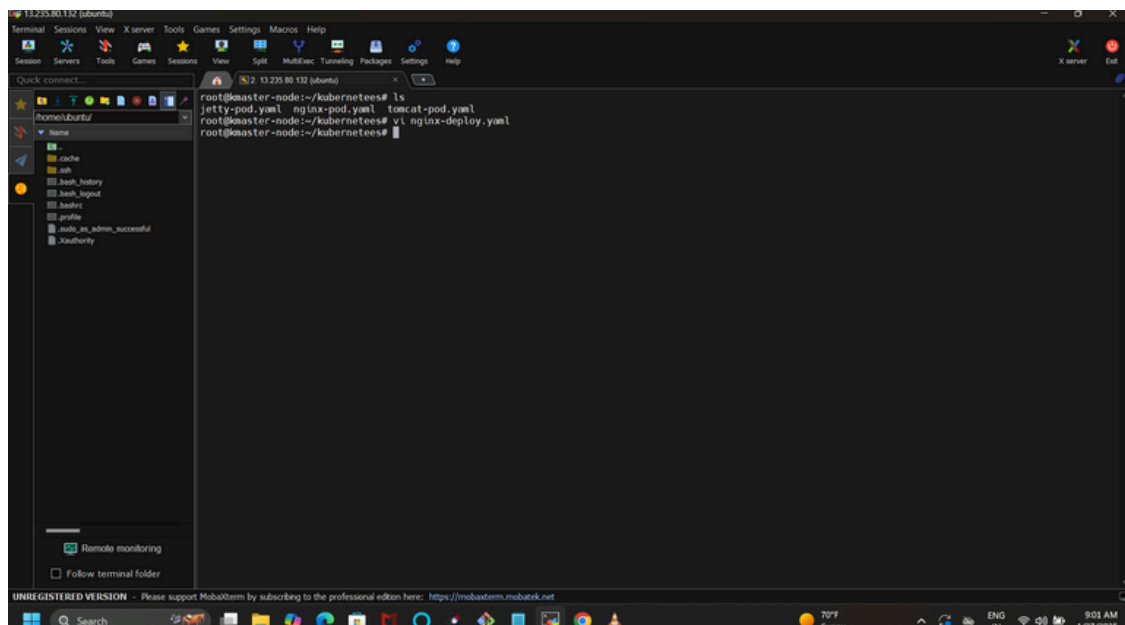
Date of submission - 27/01/2025

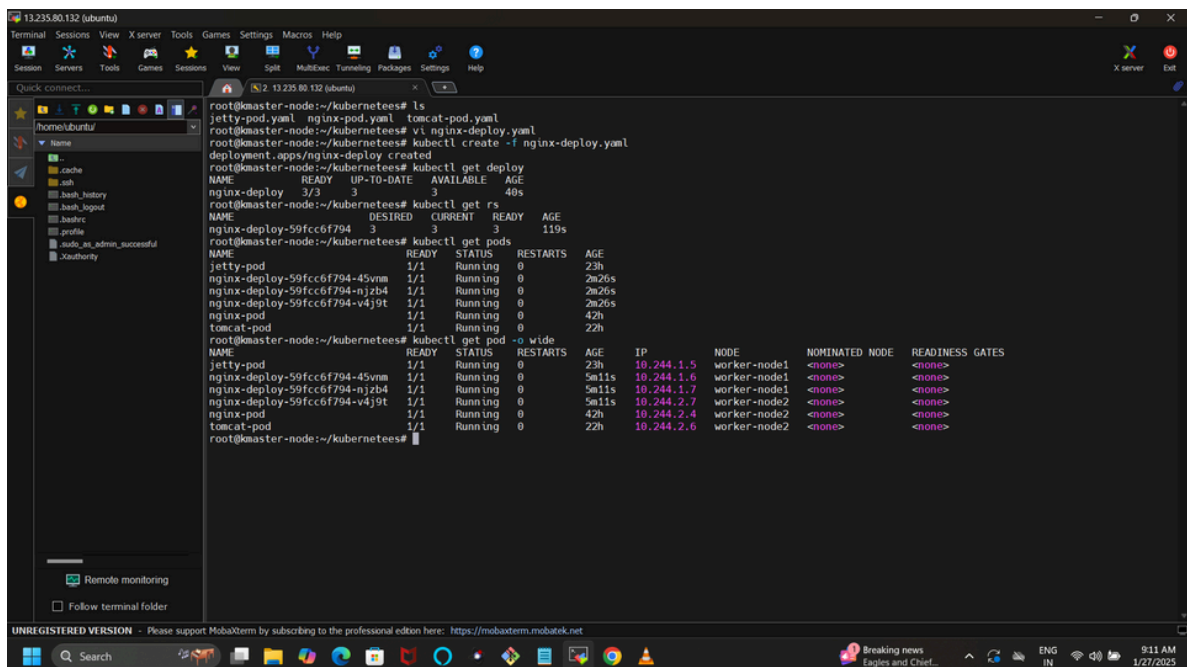
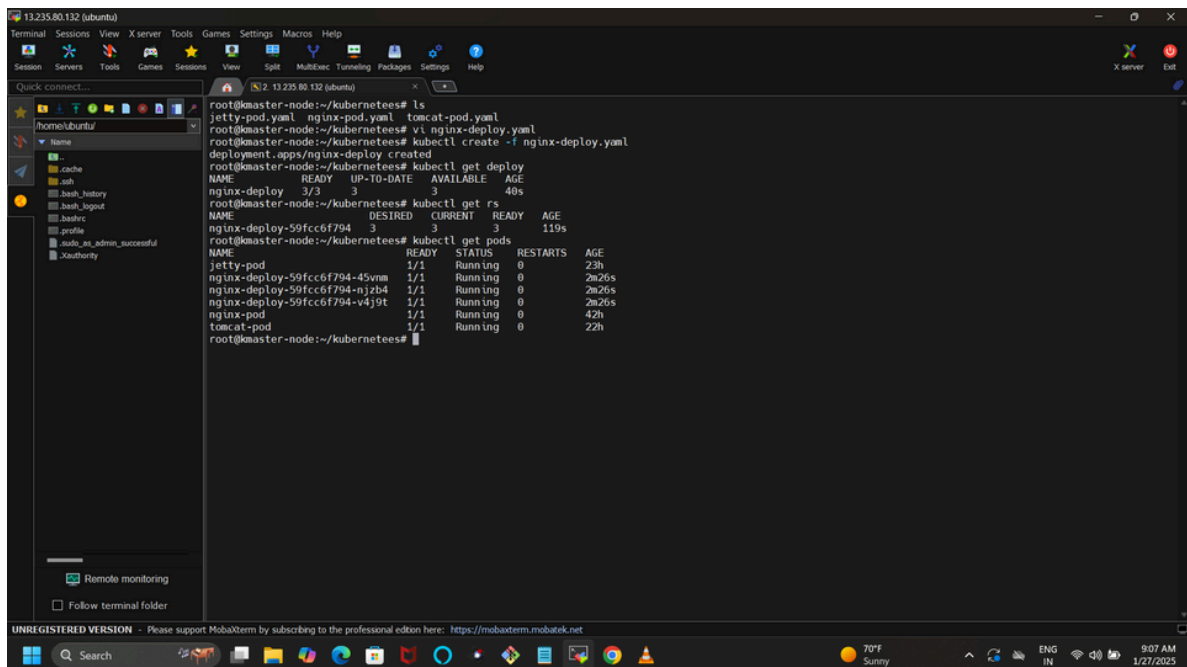
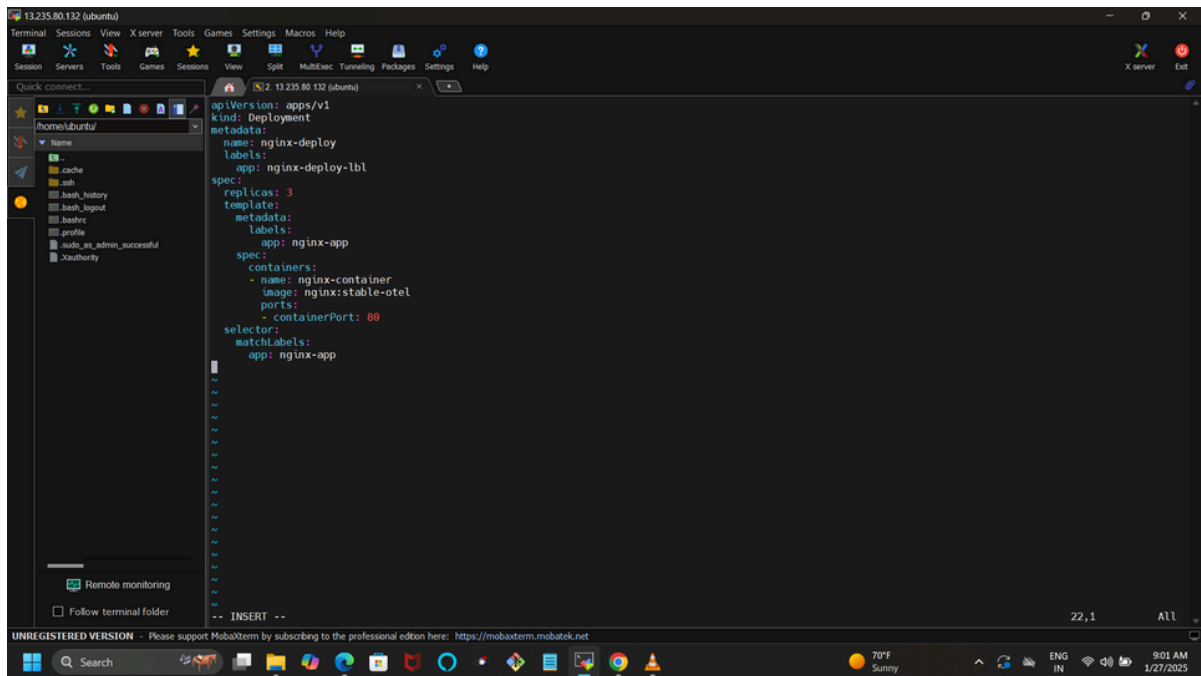
Submitted by - Chandra Sekhar

**L1 - Create Deployment Controller Object to Deploy the Application Image Created in Docker Module and Expose it to the Internet**

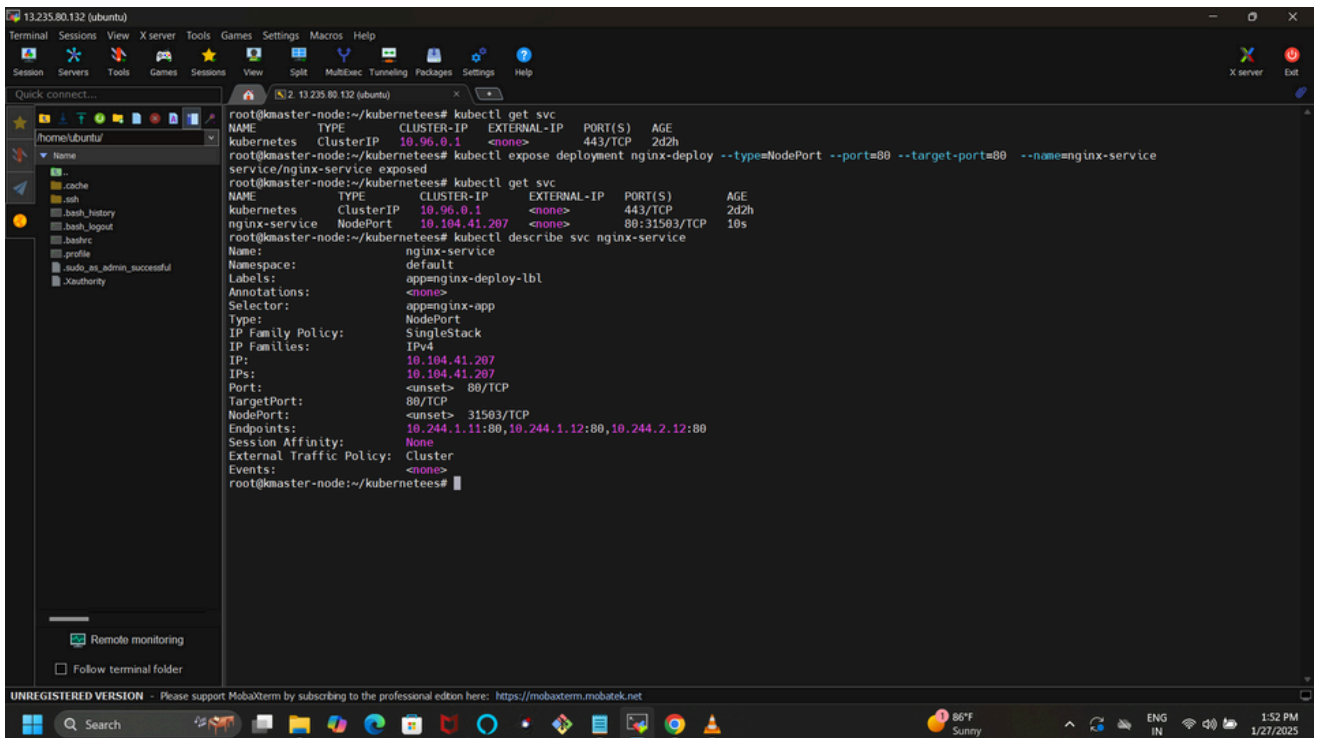
### Step 1:

First creating our yaml file with all the requirements for deployment. then

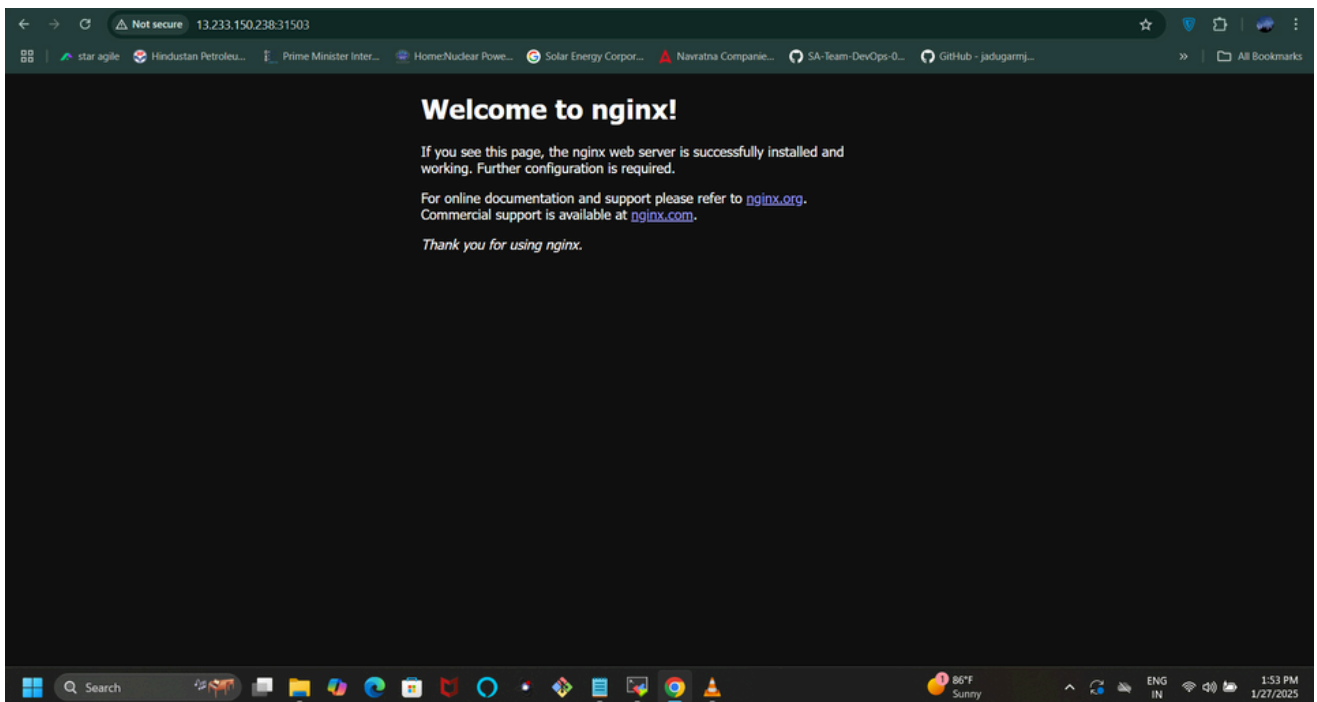




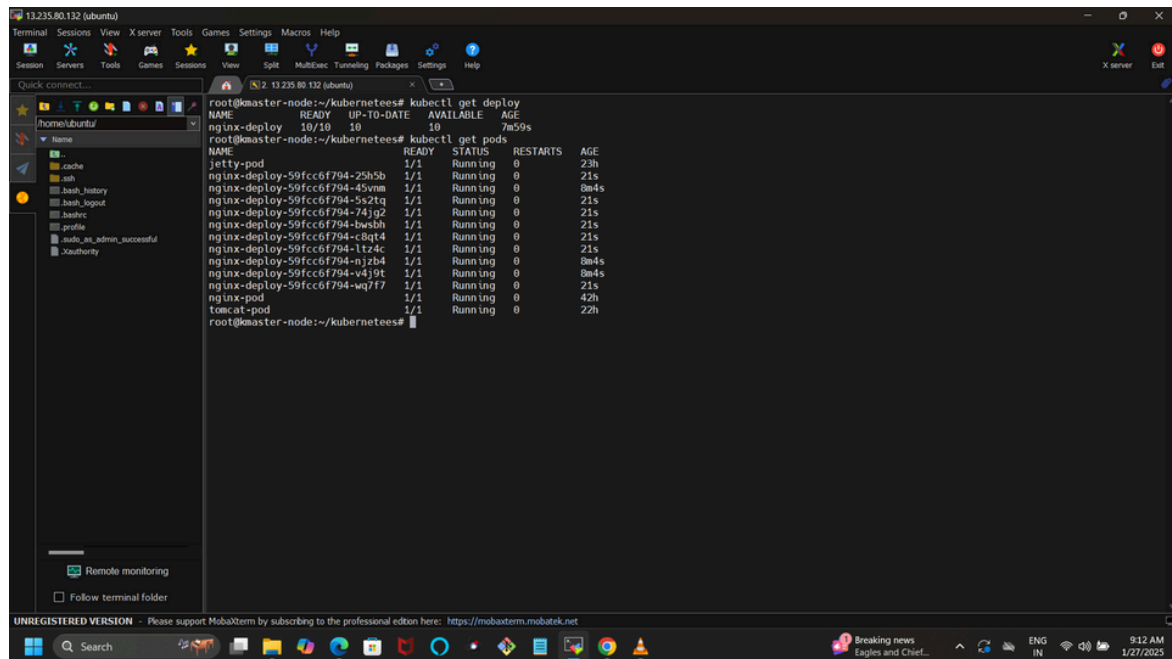
Mapping the deployment object to NodePort Service, it will be applicable to all corresponding pods.



```
root@master-node:~/kubernetes# kubectl get svc
NAME                TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
kubernetes           ClusterIP   10.96.0.1      <none>          443/TCP    2d2h
service/nginx-service exposed
root@master-node:~/kubernetes# kubectl expose deployment nginx-deploy --type=NodePort --port=80 --target-port=80 --name=nginx-service
root@master-node:~/kubernetes# kubectl get svc
NAME                TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
kubernetes           ClusterIP   10.96.0.1      <none>          443/TCP    2d2h
nginx-service        NodePort     10.104.41.207  <none>          80:31503/TCP 10s
root@master-node:~/kubernetes# kubectl describe svc nginx-service
Name:               nginx-service
Namespace:          default
Labels:              app=nginx-deploy-lbl
Annotations:         <none>
Selector:            app=nginx-app
Type:               NodePort
IP Family Policy:   SingleStack
IP Families:        IPv4
IP:                 10.104.41.207
IPs:                10.104.41.207
Port:               <unset> 80/TCP
TargetPort:         80/TCP
NodePort:           <unset> 31503/TCP
Endpoints:          10.244.1.11:80,10.244.1.12:80,10.244.2.12:80
Session Affinity:   None
External Traffic Policy: Cluster
Events:             <none>
```



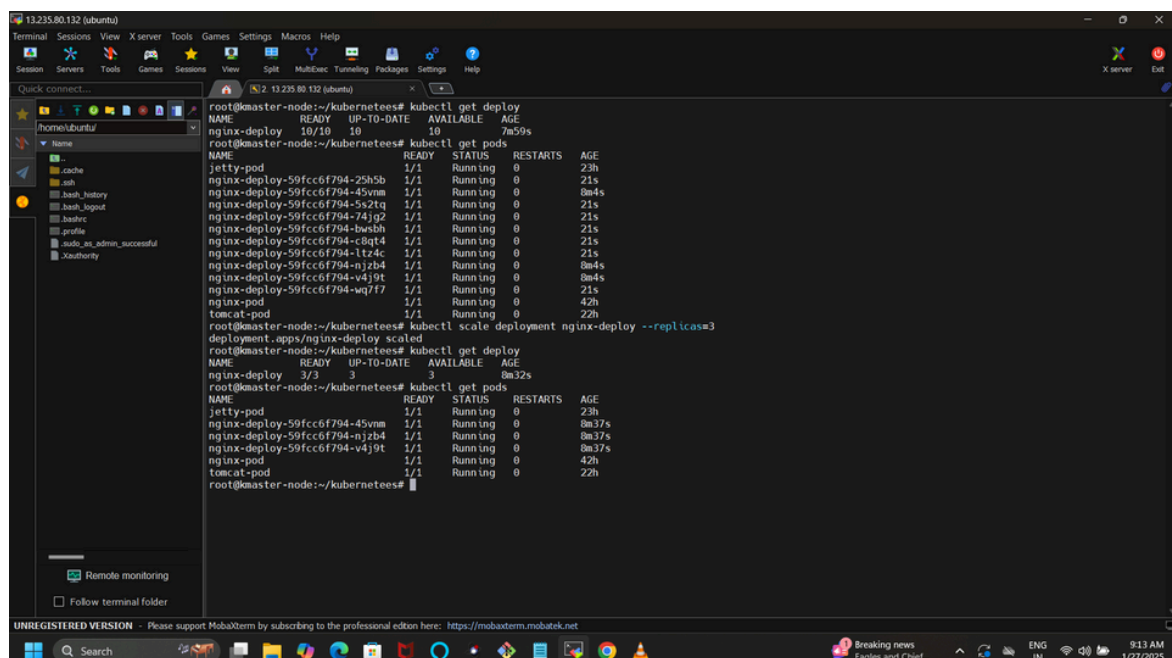
# L2 - Scale-up and Scale-Down the Pods Deployed



The screenshot shows a terminal window with the following commands and output:

```
root@master-node:~/kubernetes# kubectl get deploy
NAME READY UP-TO-DATE AVAILABLE AGE
nginx-deploy 10/10 10 10 7m59s

root@master-node:~/kubernetes# kubectl get pods
NAME STATUS RESTARTS AGE
jetty-pod 1/1 Running 0 23h
nginx-deploy-59fcc6f794-25h5b 1/1 Running 0 21s
nginx-deploy-59fcc6f794-45vnm 1/1 Running 0 8m4s
nginx-deploy-59fcc6f794-5s2tq 1/1 Running 0 21s
nginx-deploy-59fcc6f794-74jg2 1/1 Running 0 21s
nginx-deploy-59fcc6f794-bwshh 1/1 Running 0 21s
nginx-deploy-59fcc6f794-c8qt4 1/1 Running 0 21s
nginx-deploy-59fcc6f794-lt24c 1/1 Running 0 21s
nginx-deploy-59fcc6f794-nj2b4 1/1 Running 0 8m4s
nginx-deploy-59fcc6f794-v4j9t 1/1 Running 0 8m4s
nginx-deploy-59fcc6f794-wq7f7 1/1 Running 0 21s
nginx-pod 1/1 Running 0 42h
tomcat-pod 1/1 Running 0 22h
```



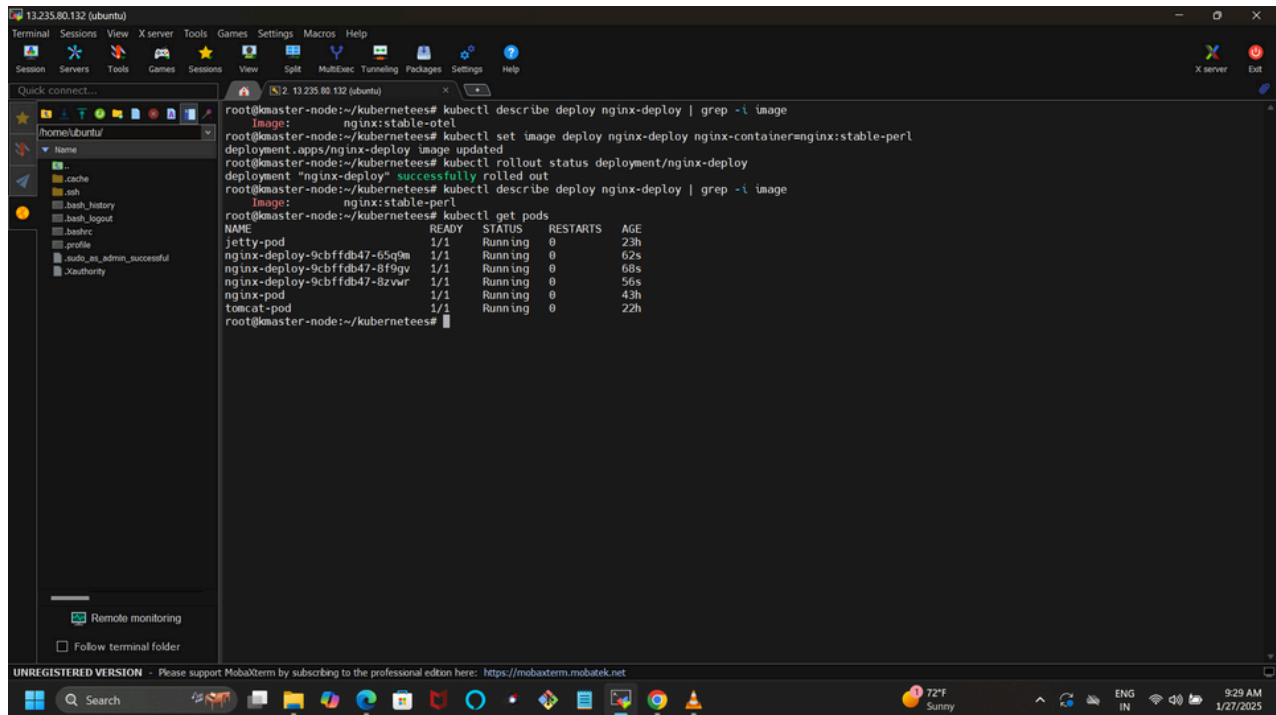
The screenshot shows a terminal window with the following commands and output:

```
root@master-node:~/kubernetes# kubectl scale deployment nginx-deploy --replicas=3
deployment.apps/nginx-deploy scaled

root@master-node:~/kubernetes# kubectl get deploy
NAME READY UP-TO-DATE AVAILABLE AGE
nginx-deploy 3/3 3 3 8m32s

root@master-node:~/kubernetes# kubectl get pods
NAME STATUS RESTARTS AGE
jetty-pod 1/1 Running 0 23h
nginx-deploy-59fcc6f794-45vnm 1/1 Running 0 8m37s
nginx-deploy-59fcc6f794-nj2b4 1/1 Running 0 8m37s
nginx-deploy-59fcc6f794-v4j9t 1/1 Running 0 8m37s
nginx-pod 1/1 Running 0 42h
tomcat-pod 1/1 Running 0 22h
```

## L3 - Implement Rolling-Update Strategy to Upgrade the Application Image from V1.0 to V1.1



The screenshot shows a MobaXterm terminal window with the following commands and output:

```
root@kmaster-node:~/kubernetes# kubectl describe deploy nginx-deploy | grep -i image
Image:
  nginx:stable-otel
root@kmaster-node:~/kubernetes# kubectl set image deploy nginx-deploy nginx-container=nginx:stable-perl
deployment.apps/nginx-deploy image updated
root@kmaster-node:~/kubernetes# kubectl rollout status deployment/nginx-deploy
deployment "nginx-deploy" successfully rolled out
root@kmaster-node:~/kubernetes# kubectl describe deploy nginx-deploy | grep -i image
Image:
  nginx:stable-perl
root@kmaster-node:~/kubernetes# kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
jetty-pod	1/1	Running	0	23h
nginx-deploy-9cbffdb47-65q9m	1/1	Running	0	62s
nginx-deploy-9cbffdb47-8f9gv	1/1	Running	0	68s
nginx-deploy-9cbffdb47-8zvvr	1/1	Running	0	56s
nginx-pod	1/1	Running	0	43h
tomcat-pod	1/1	Running	0	22h

root@kmaster-node:~/kubernetes#

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