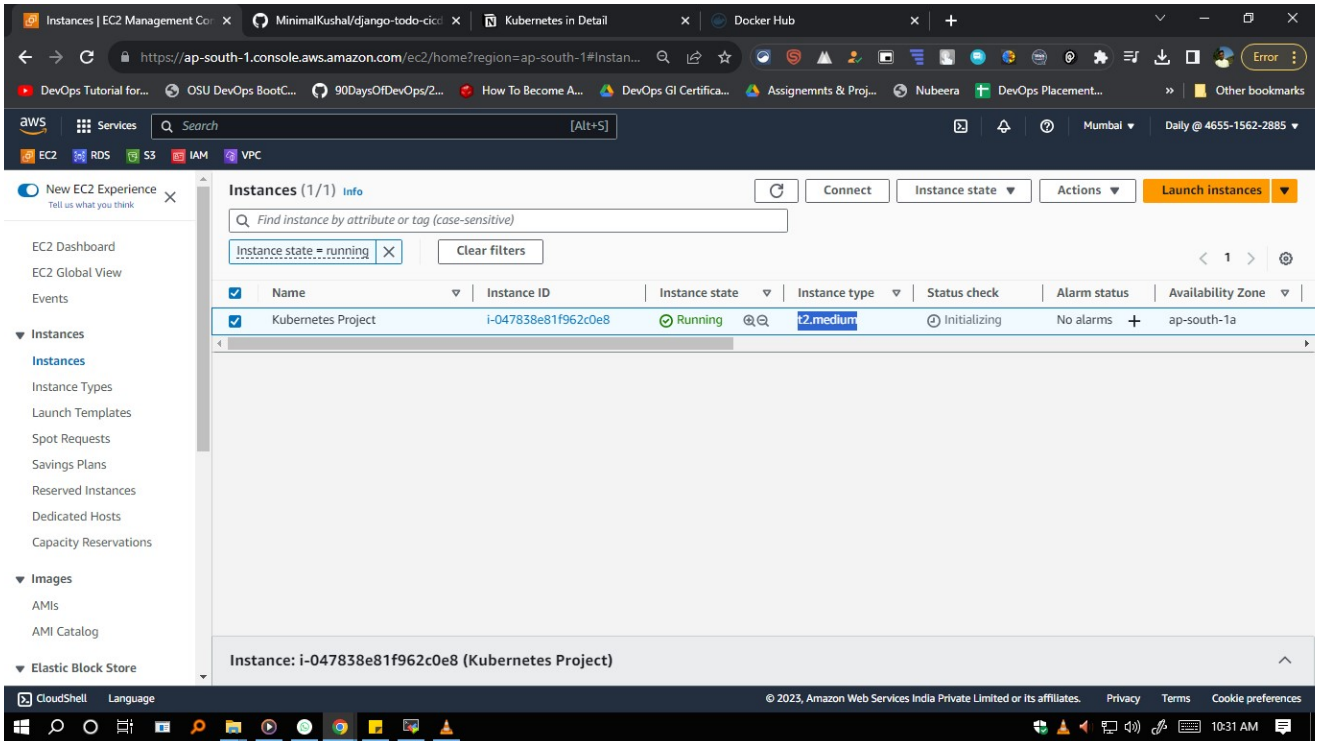
Kubernetes Minikube Assignment

By Kushal Chauhan

In this assignment I will be using Minikube Cluster to show Pod, Deployment and Service Creation, Replication and Auto healing for Kubernetes Cluster.

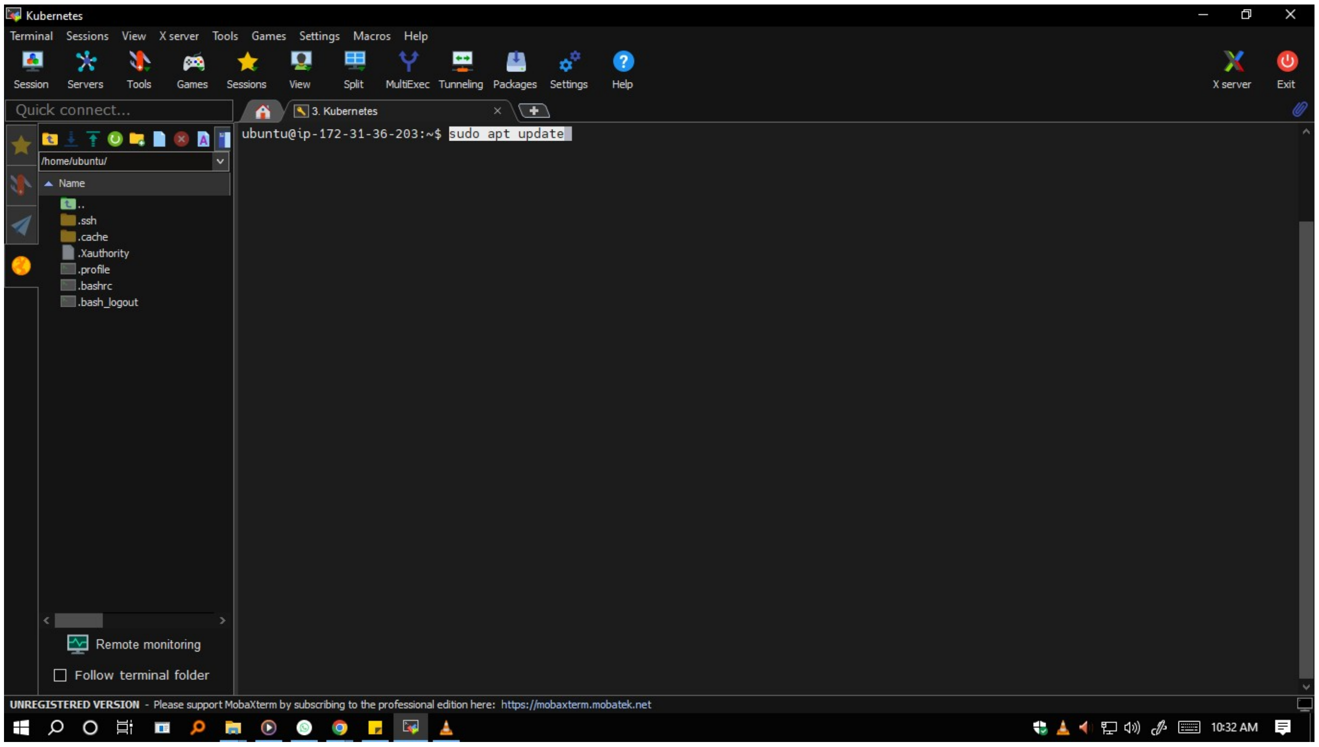
1. First we need to create a T2 Medium EC2 instance (I am using Ubuntu AMI) as this is the minimum requirement for Minikube to run.



Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
Kubernetes Project	i-047838e81f962c0e8	Running	t2.medium	Initializing	No alarms	ap-south-1a

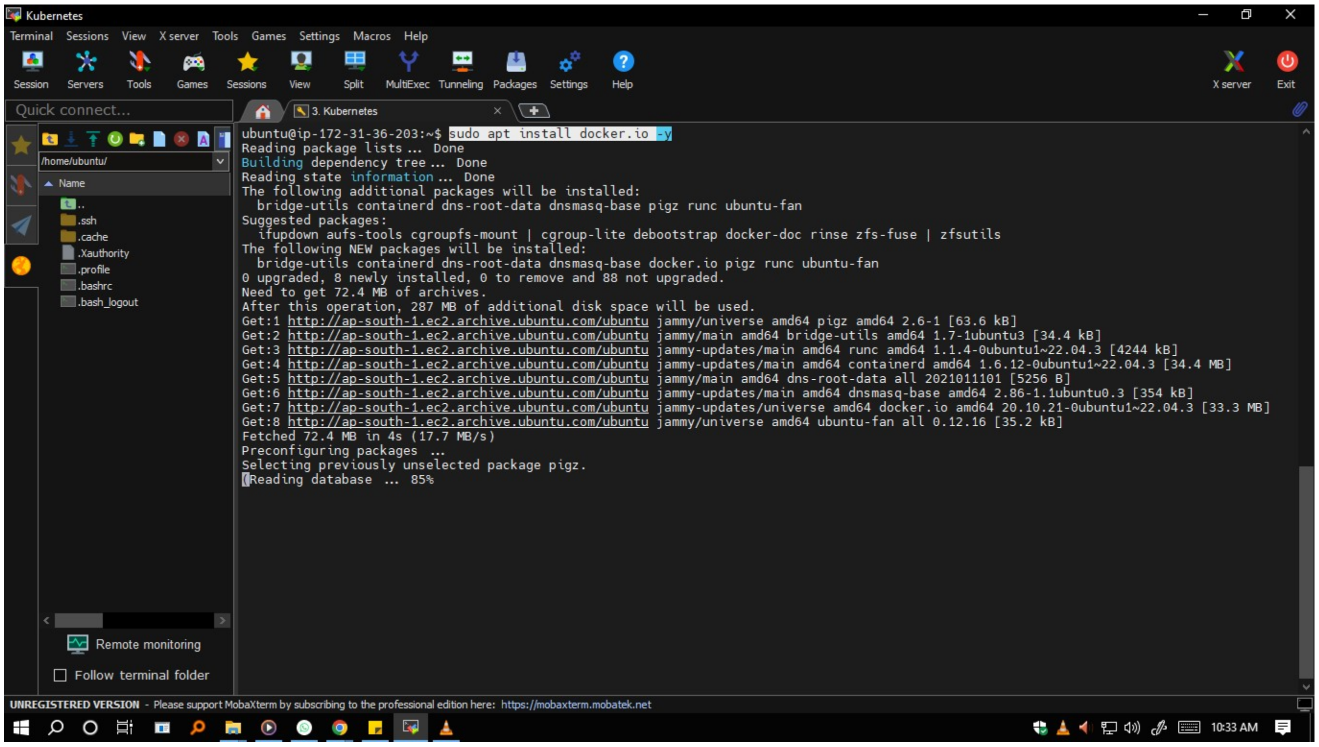
Instance: i-047838e81f962c0e8 (Kubernetes Project)

2. Then we need to update the package list using “sudo apt update” command.



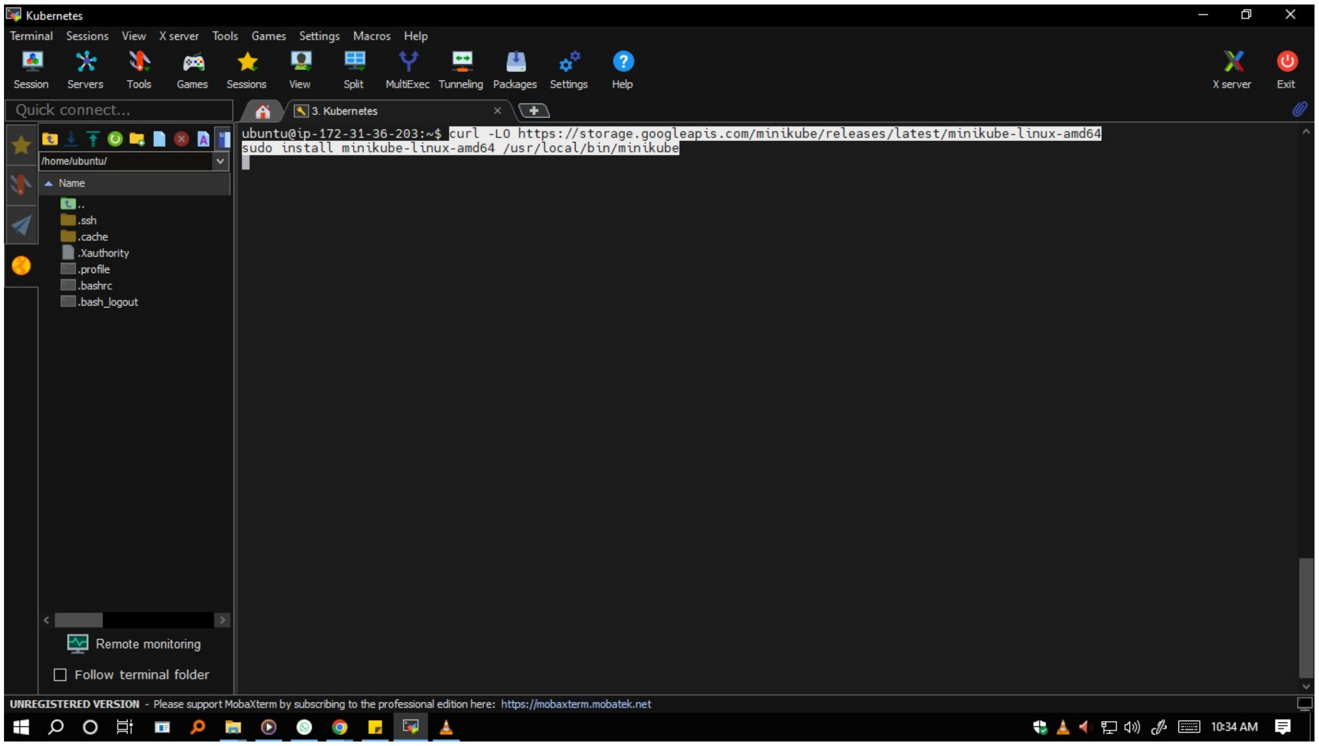
```
ubuntu@ip-172-31-36-203:~$ sudo apt update
```

3. Then we will install Docker in our Ubuntu EC2 instance.



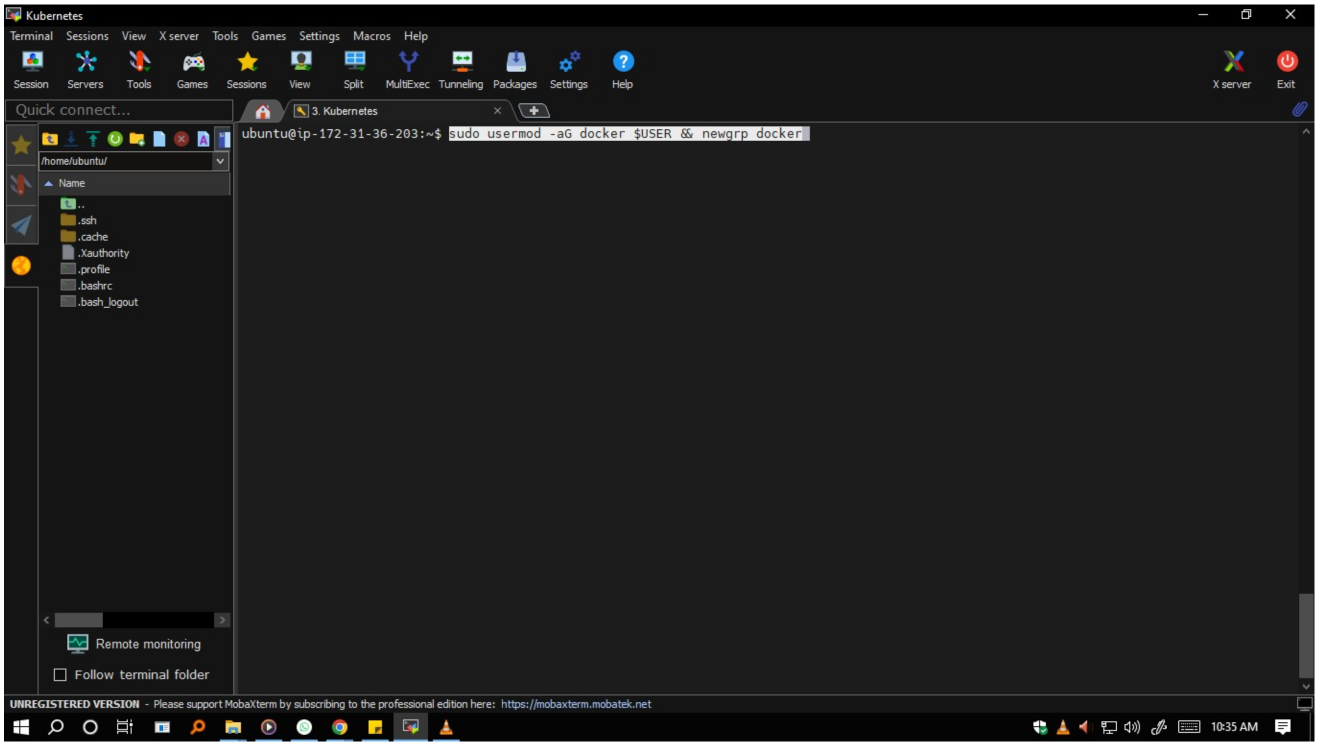
```
ubuntu@ip-172-31-36-203:~$ sudo apt install docker.io -y
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
The following additional packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 88 not upgraded.
Need to get 72.4 MB of archives.
After this operation, 287 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 pigz amd64 2.6-1 [63.6 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 bridge-utils amd64 1.7-1ubuntu3 [34.4 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 runc amd64 1.1.4-0ubuntu1~22.04.3 [4244 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 containerd amd64 1.6.12-0ubuntu1~22.04.3 [34.4 MB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 dns-root-data all 2021011101 [5256 B]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 dnsmasq-base amd64 2.86-1.1ubuntu0.3 [354 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 docker.io amd64 20.10.21-0ubuntu1~22.04.3 [33.3 MB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 ubuntu-fan all 0.12.16 [35.2 kB]
Fetched 72.4 MB in 4s (17.7 MB/s)
Preconfiguring packages ...
Selecting previously unselected package pigz.
(Reading database ... 85%
```

4. After that we will install Minikube.



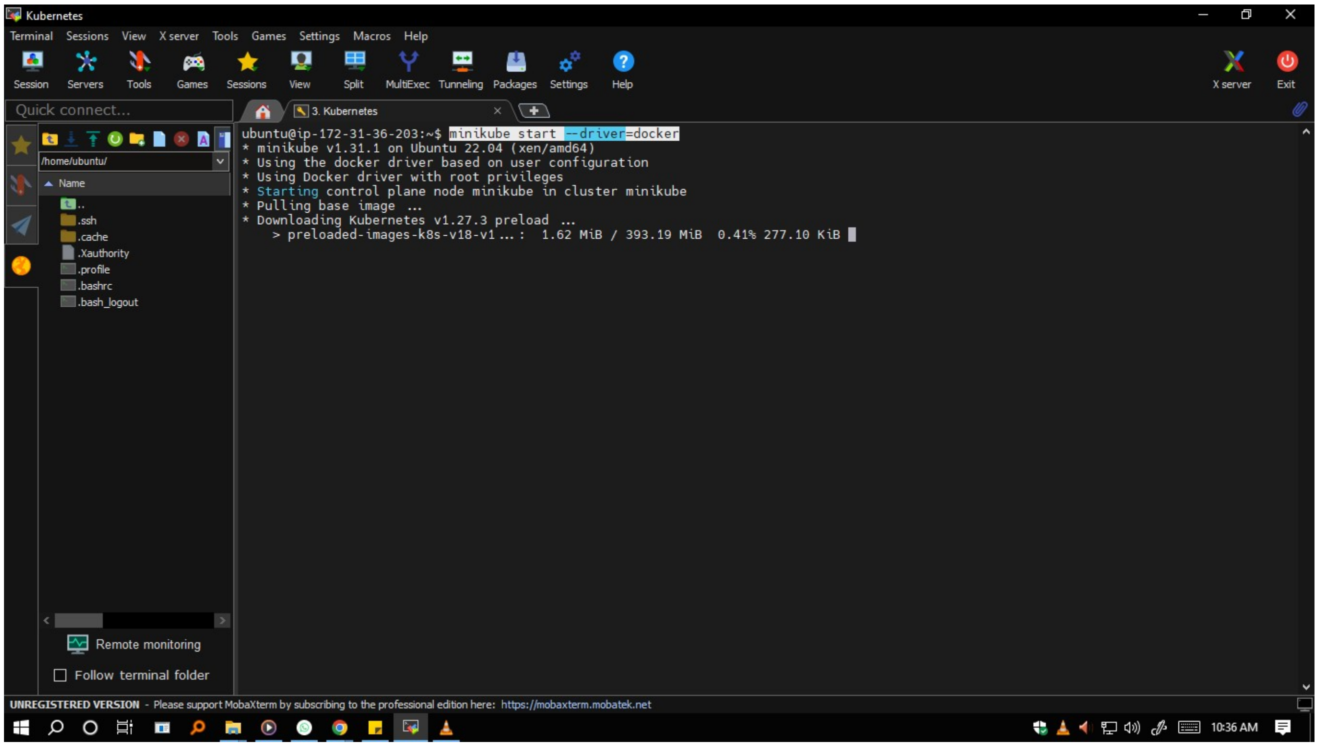
```
ubuntu@ip-172-31-36-203:~$ curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
sudo install minikube-linux-amd64 /usr/local/bin/minikube
```

5. Add current user to Docker Group.



```
ubuntu@ip-172-31-36-203:~$ sudo usermod -aG docker $USER && newgrp docker
```

6. Start the Minikube Kubernetes Cluster using “minikube start –driver=docker” command.



```
ubuntu@ip-172-31-36-203:~$ minikube start --driver=docker
* minikube v1.31.1 on Ubuntu 22.04 (xen/amd64)
* Using the docker driver based on user configuration
* Using Docker driver with root privileges
* Starting control plane node minikube in cluster minikube
* Pulling base image ...
* Downloading Kubernetes v1.27.3 preload ...
    > preloaded-images-k8s-v18-v1...:  1.62 MiB / 393.19 MiB  0.41% 277.10 KiB
```

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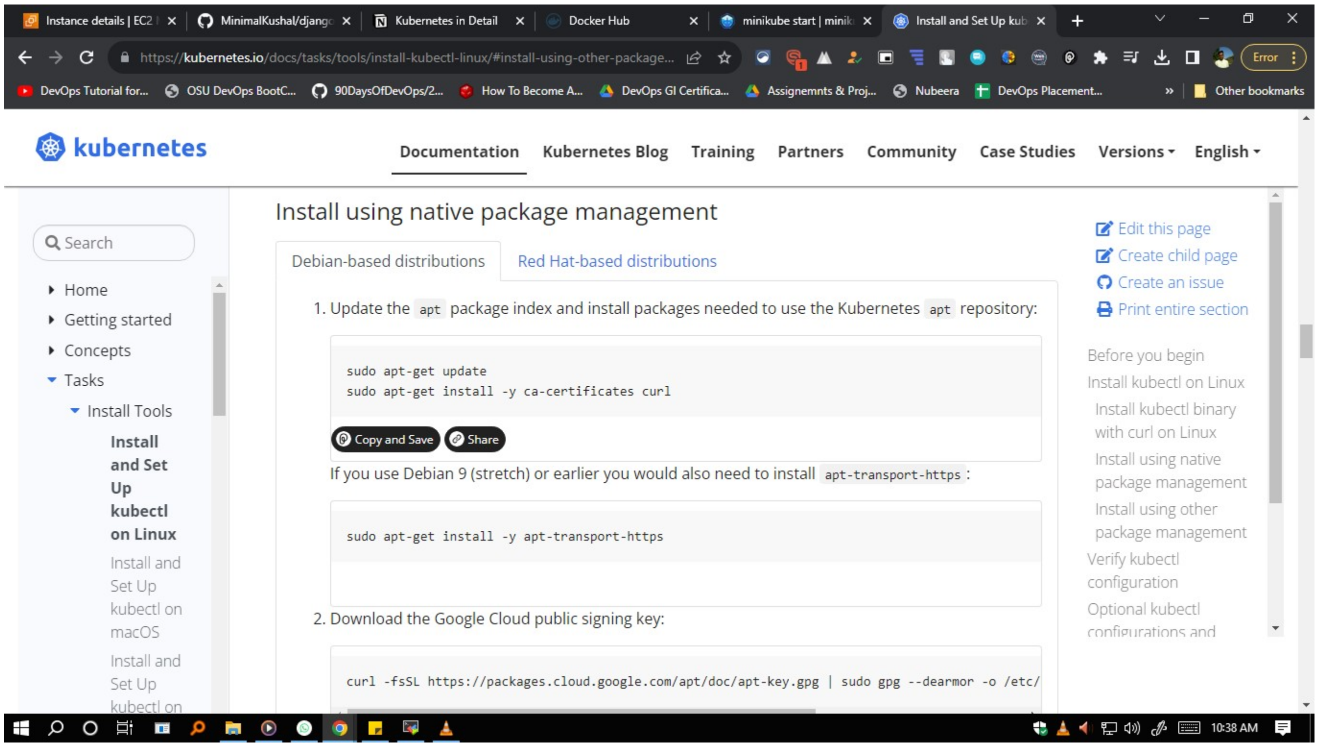
7. Then head over to Kubectl installation page to get all commands regarding the installation of Kubectl.



https://kubernetes.io/docs/tasks/tools/install-kubectl-linux/#install-using-other-package...

Install using native package management

Debian-based distributions | Red Hat-based distributions

1. Update the `apt` package index and install packages needed to use the Kubernetes `apt` repository:

```
sudo apt-get update
sudo apt-get install -y ca-certificates curl
```

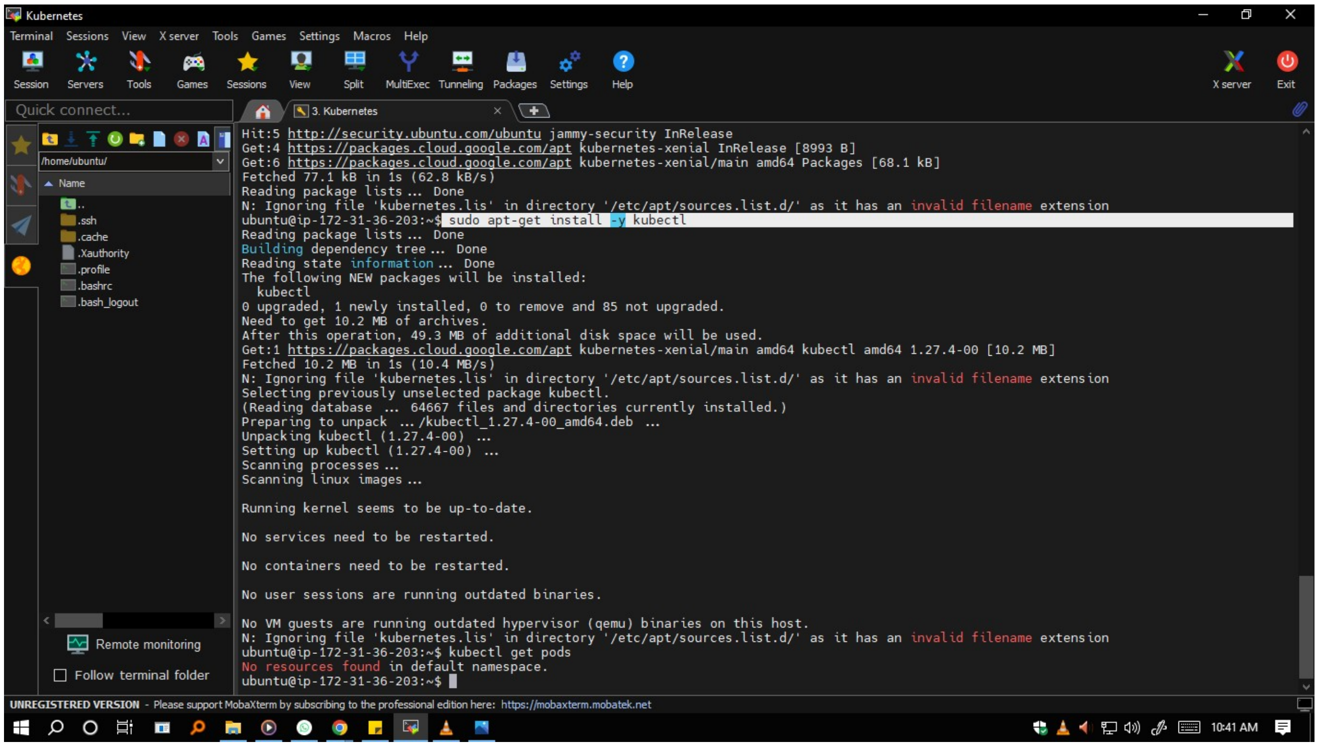
If you use Debian 9 (stretch) or earlier you would also need to install `apt-transport-https`:

```
sudo apt-get install -y apt-transport-https
```

2. Download the Google Cloud public signing key:

```
curl -fsSL https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo gpg --dearmor -o /etc/
```

8. After following all the commands on the page we have successfully installed Kubectl. We have confirmed it by using “kubectl get pods” command which is used to display the created pod.



```
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:4 https://packages.cloud.google.com/apt kubernetes-xenial InRelease [8993 B]
Get:6 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 Packages [68.1 kB]
Fetched 77.1 kB in 1s (62.8 kB/s)
Reading package lists ... Done
N: Ignoring file 'kubernetes.lis' in directory '/etc/apt/sources.list.d/' as it has an invalid filename extension
ubuntu@ip-172-31-36-203:~$ sudo apt-get install -y kubectl
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
The following NEW packages will be installed:
  kubectl
0 upgraded, 1 newly installed, 0 to remove and 85 not upgraded.
Need to get 10.2 MB of archives.
After this operation, 49.3 MB of additional disk space will be used.
Get:1 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubectl amd64 1.27.4-00 [10.2 MB]
Fetched 10.2 MB in 1s (10.4 MB/s)
N: Ignoring file 'kubernetes.lis' in directory '/etc/apt/sources.list.d/' as it has an invalid filename extension
Selecting previously unselected package kubectl.
(Reading database ... 64667 files and directories currently installed.)
Preparing to unpack .../kubectl_1.27.4-00_amd64.deb ...
Unpacking kubectl (1.27.4-00) ...
Setting up kubectl (1.27.4-00) ...
Scanning processes ...
Scanning linux images ...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
N: Ignoring file 'kubernetes.lis' in directory '/etc/apt/sources.list.d/' as it has an invalid filename extension
ubuntu@ip-172-31-36-203:~$ kubectl get pods
No resources found in default namespace.
ubuntu@ip-172-31-36-203:~$
```

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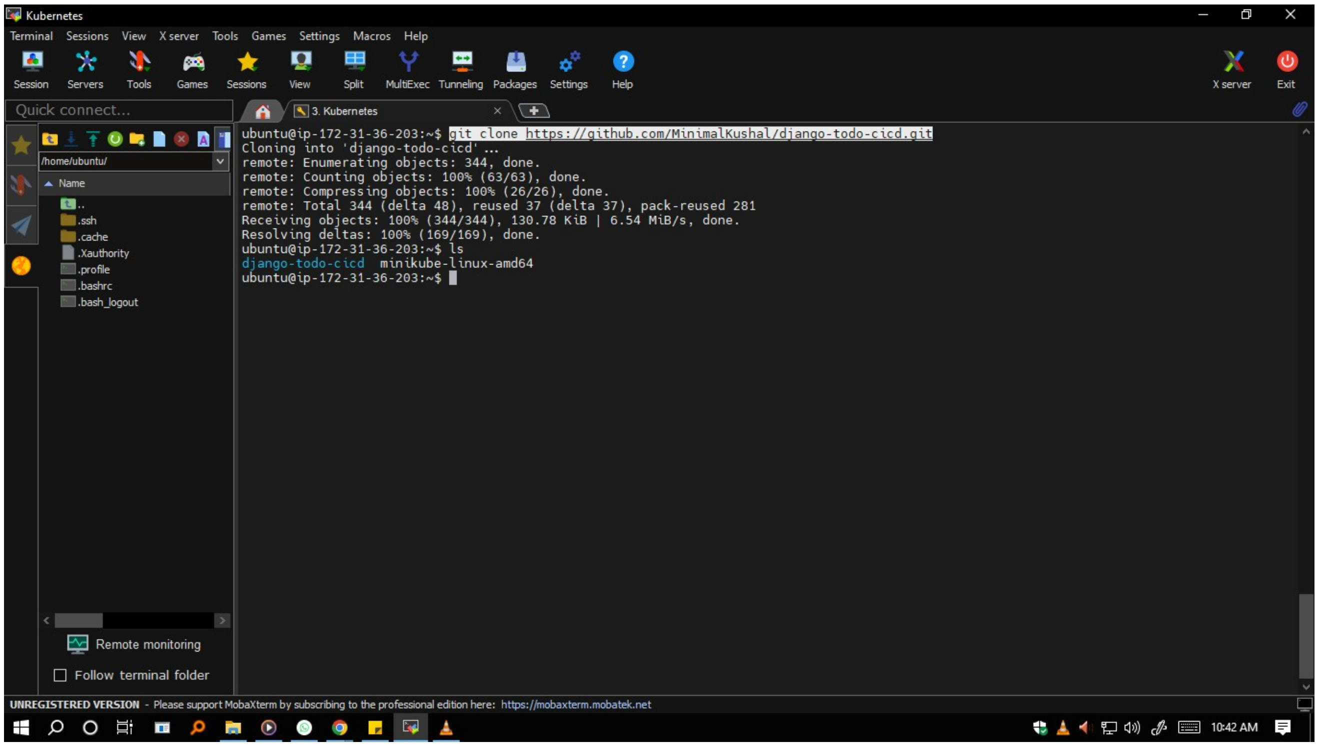
9. After successfully installing all the required packages, we clone the GitHub repo to our local machine.



```
ubuntu@ip-172-31-36-203:~$ git clone https://github.com/MinimalKushal/django-todo-cicd.git
Cloning into 'django-todo-cicd' ...
remote: Enumerating objects: 344, done.
remote: Counting objects: 100% (63/63), done.
remote: Compressing objects: 100% (26/26), done.
remote: Total 344 (delta 48), reused 37 (delta 37), pack-reused 281
Receiving objects: 100% (344/344), 130.78 KiB | 6.54 MiB/s, done.
Resolving deltas: 100% (169/169), done.
ubuntu@ip-172-31-36-203:~$ ls
django-todo-cicd  minikube-linux-amd64
ubuntu@ip-172-31-36-203:~$
```

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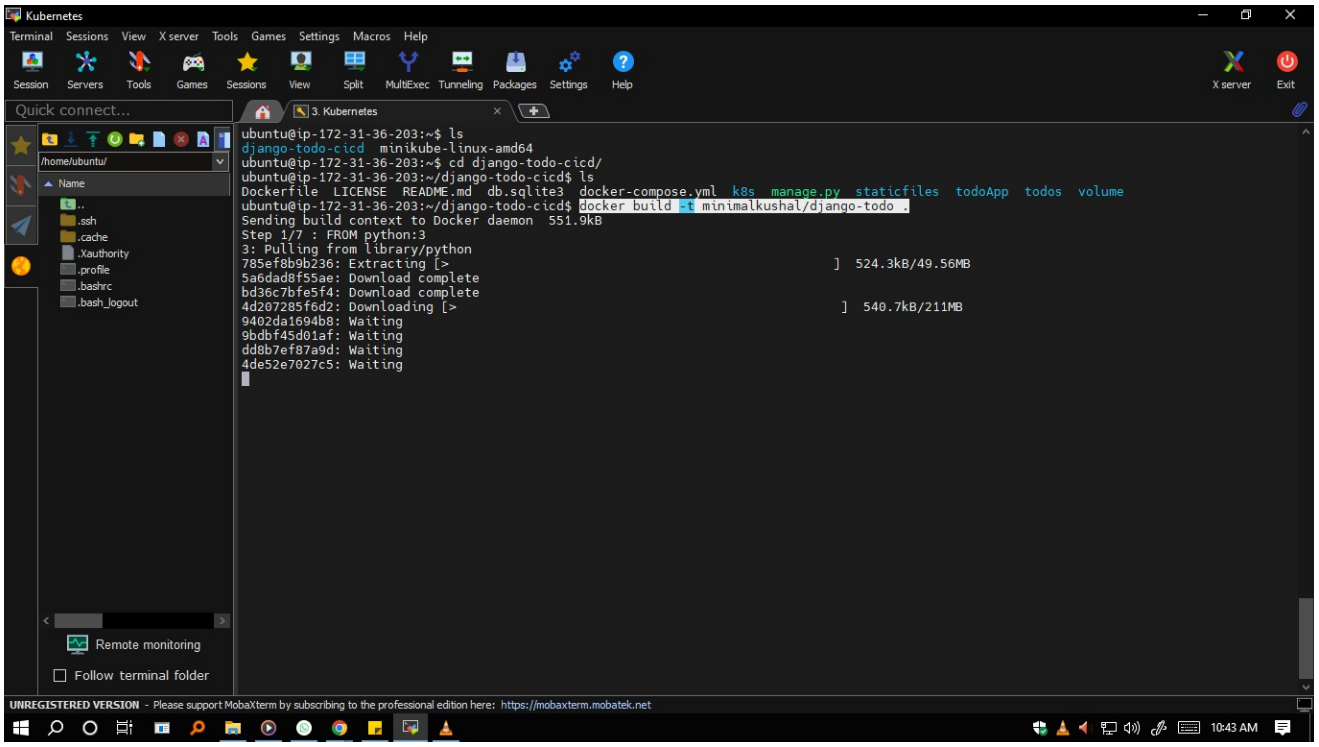
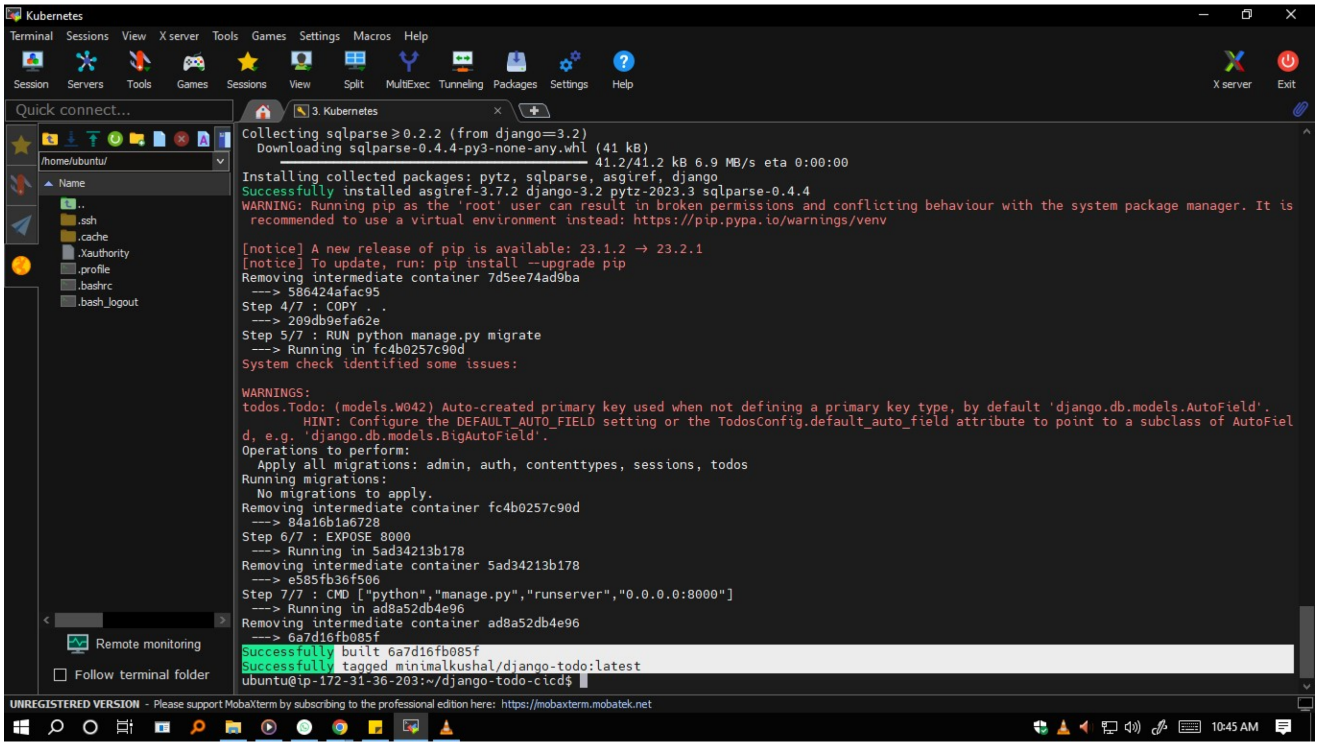
10. Then we go Inside the directory which we cloned using “cd” command. And then we build the Docker image using the Dockerfile provided.



```
ubuntu@ip-172-31-36-203:~$ ls
django-todo-cicd  minikube-linux-amd64
ubuntu@ip-172-31-36-203:~$ cd django-todo-cicd/
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ ls
Dockerfile  LICENSE  README.md  db.sqlite3  docker-compose.yml  k8s  manage.py  staticfiles  todoApp  todos  volume
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ docker build -t minimalkushal/django-todo .
Sending build context to Docker daemon  551.9kB
Step 1/7 : FROM python:3
3: Pulling from library/python
785ef8b9b236: Extracting [>                                                  ]  524.3kB/49.56MB
5a6dad8f55ae: Download complete
bd36c7bfe5f4: Download complete
4d207285f6d2: Downloading [>                                                  ]  540.7kB/211MB
9402da1694b8: Waiting
9bdbf45d01af: Waiting
dd8b7ef87a9d: Waiting
4de52e7027c5: Waiting
```

11. Our Docker images has successfully been created.

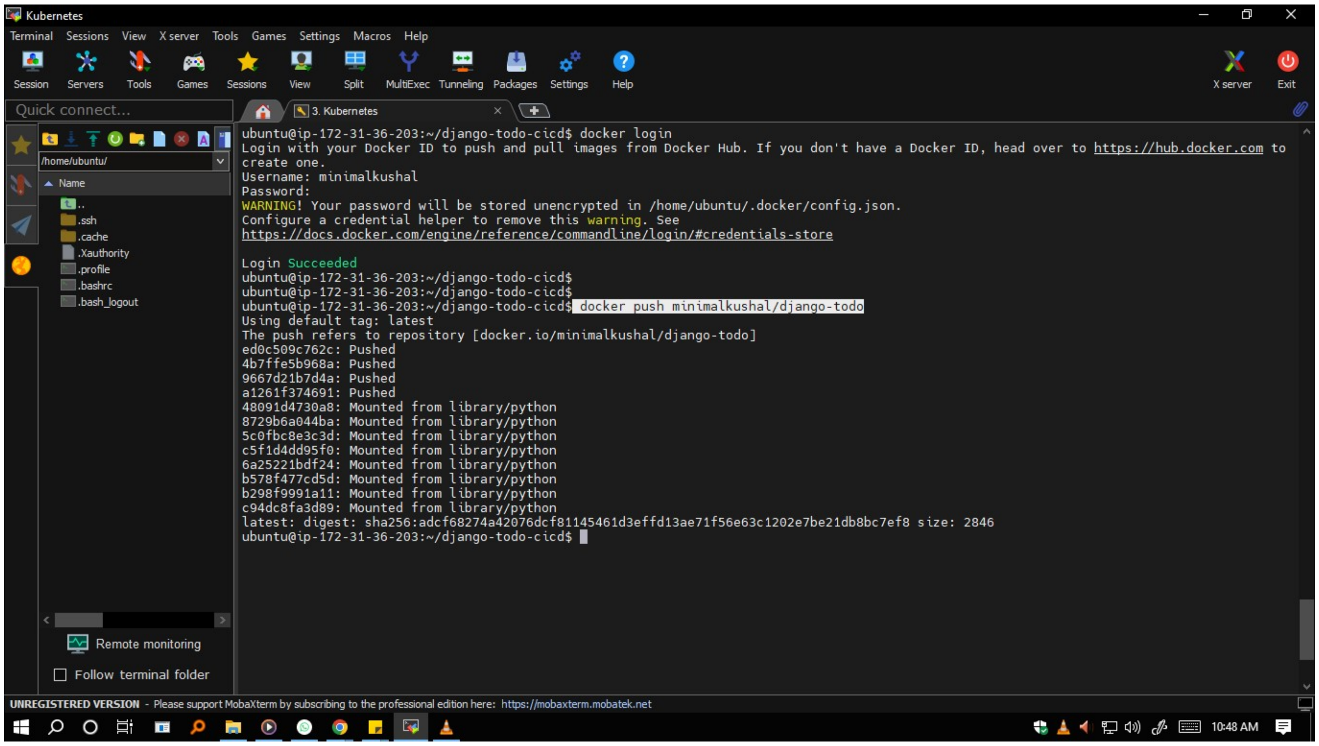


```
Collecting sqlparse≥0.2.2 (from django==3.2)
  Downloading sqlparse-0.4.4-py3-none-any.whl (41 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 41.2/41.2 kB 6.9 MB/s eta 0:00:00
Installing collected packages: pytz, sqlparse, asgiref, django
Successfully installed asgiref-3.7.2 django-3.2 pytz-2023.3 sqlparse-0.4.4
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is
 recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv

[notice] A new release of pip is available: 23.1.2 -> 23.2.1
[notice] To update, run: pip install --upgrade pip
Removing intermediate container 7d5ee74ad9ba
 ---> 586424afac95
Step 4/7 : COPY . .
 ---> 209db9efa62e
Step 5/7 : RUN python manage.py migrate
 ---> Running in fc4b0257c90d
System check identified some issues:

WARNINGS:
todos.Todo: (models.W042) Auto-created primary key used when not defining a primary key type, by default 'django.db.models.AutoField'.
        HINT: Configure the DEFAULT_AUTO_FIELD setting or the TodosConfig.default_auto_field attribute to point to a subclass of AutoFiel
d, e.g. 'django.db.models.BigAutoField'.
Operations to perform:
  Apply all migrations: admin, auth, contenttypes, sessions, todos
Running migrations:
  No migrations to apply.
Removing intermediate container fc4b0257c90d
 ---> 84a16b1a6728
Step 6/7 : EXPOSE 8000
 ---> Running in 5ad34213b178
Removing intermediate container 5ad34213b178
 ---> e585fb36f506
Step 7/7 : CMD ["python","manage.py","runserver","0.0.0.0:8000"]
 ---> Running in ad8a52db4e96
Removing intermediate container ad8a52db4e96
 ---> 6a7d16fb085f
Successfully built 6a7d16fb085f
Successfully tagged minimalkushal/django-todo:latest
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

12. Then login in and push the created image to Docker Hub.



```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to
create one.
Username: minimalkushal
Password:
WARNING! Your password will be stored unencrypted in /home/ubuntu/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ docker push minimalkushal/django-todo
Using default tag: latest
The push refers to repository [docker.io/minimalkushal/django-todo]
ed0c509c762c: Pushed
4b7ffe5b968a: Pushed
9667d21b7d4a: Pushed
a1261f374691: Pushed
48091d4730a8: Mounted from library/python
8729b6a044ba: Mounted from library/python
5c0fbc8e3c3d: Mounted from library/python
c5f1d4dd95f0: Mounted from library/python
6a25221bdf24: Mounted from library/python
b578f477cd5d: Mounted from library/python
b298f9991a11: Mounted from library/python
c94dc8fa3d89: Mounted from library/python
latest: digest: sha256:adcf68274a42076dcf81145461d3effd13ae71f56e63c1202e7be21db8bc7ef8 size: 2846
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

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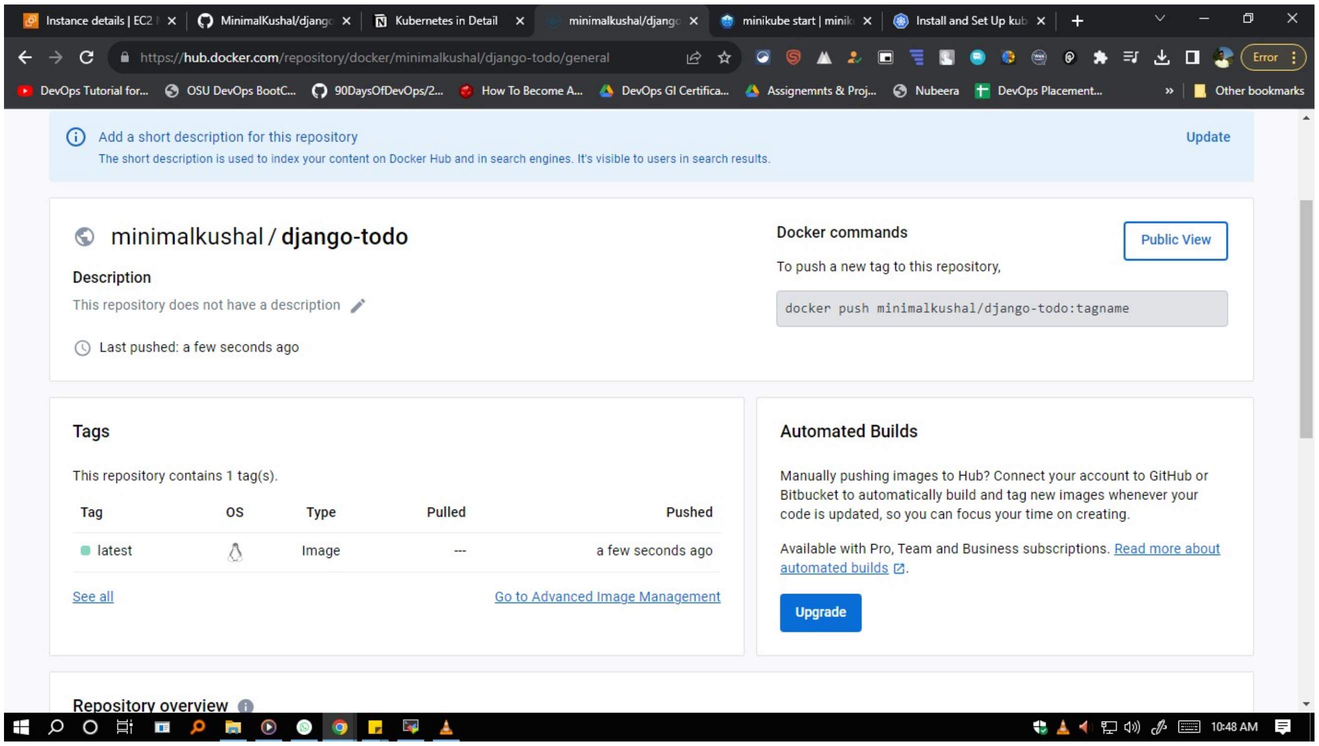
13. We can see our Docker images has been pushed to Docker Hub.



https://hub.docker.com/repository/docker/minimalkushal/django-todo/general

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.

minimalkushal / django-todo

Description

This repository does not have a description

Last pushed: a few seconds ago

Docker commands

To push a new tag to this repository,

```
docker push minimalkushal/django-todo:tagname
```

Tags

This repository contains 1 tag(s).

Tag	OS	Type	Pulled	Pushed
latest		Image	---	a few seconds ago

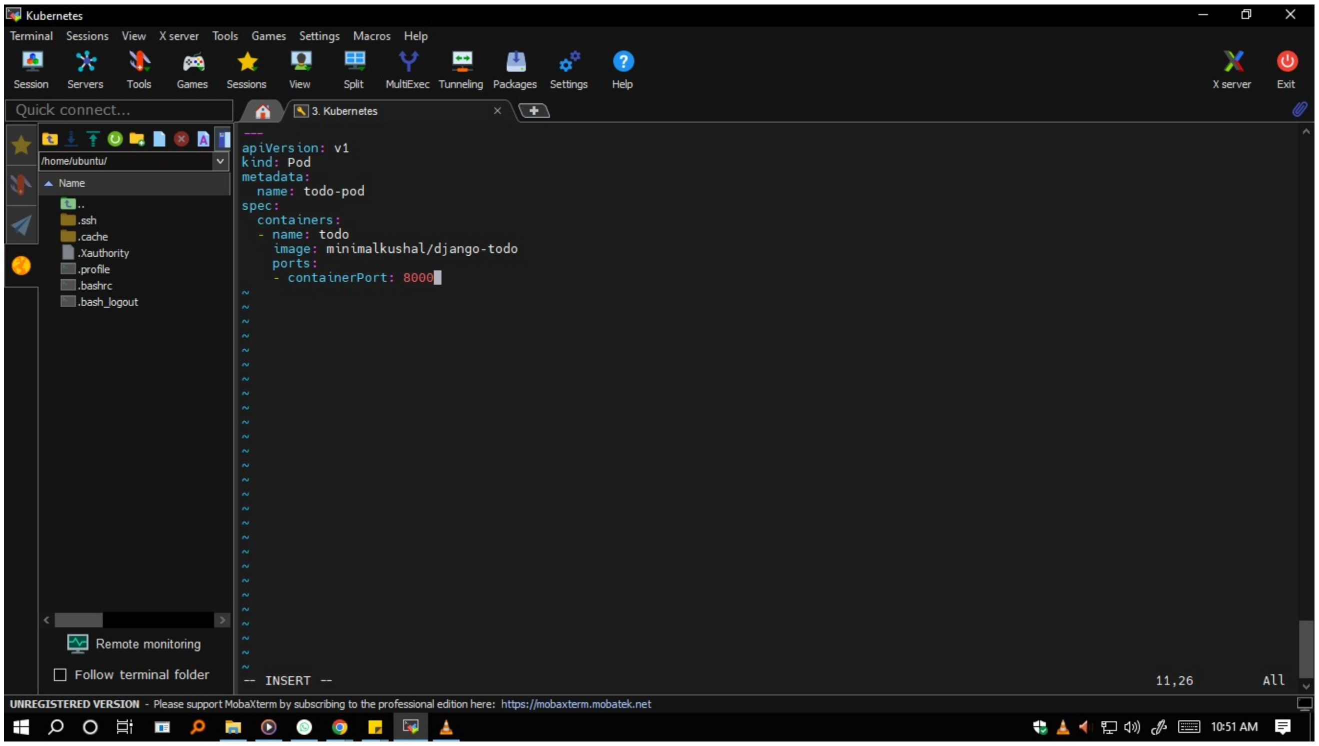
Automated Builds

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. Read more about automated builds.

Repository overview

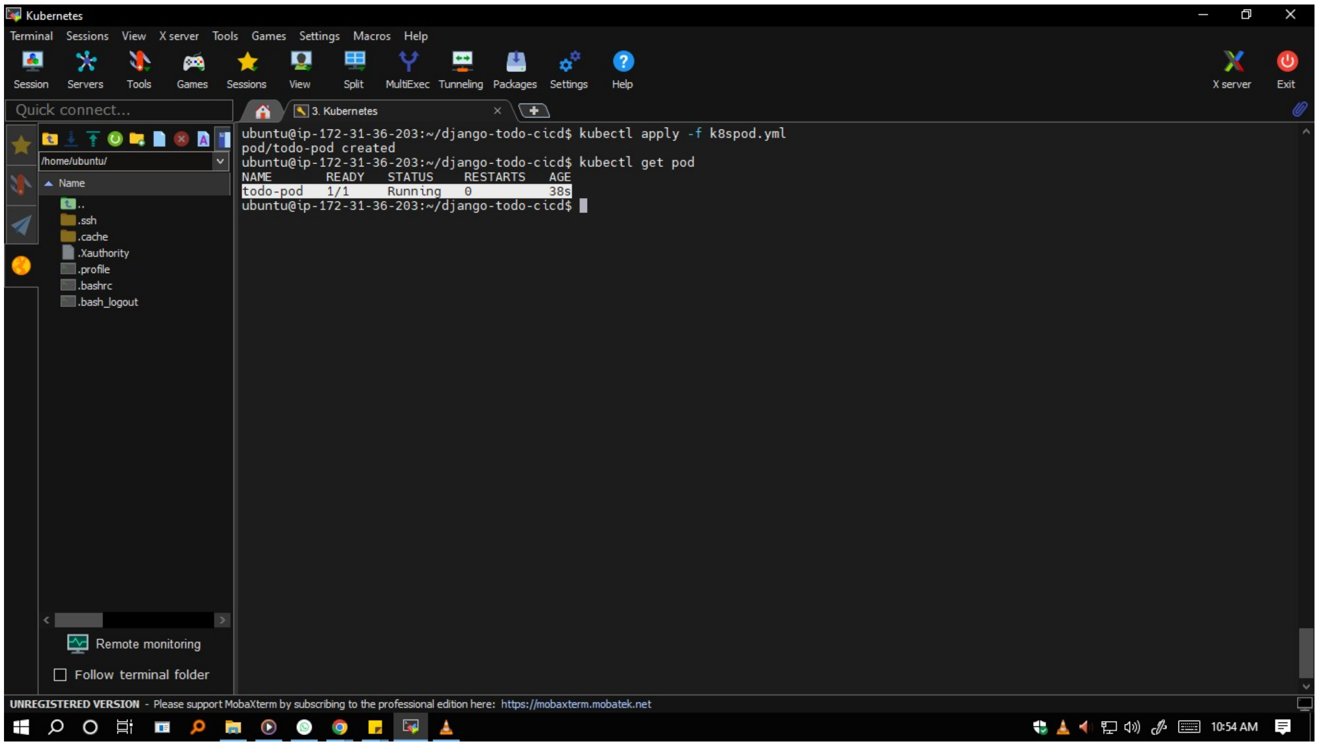
14. Then we create a pod.yml file and write a Kubernetes Manifest file to create a pod.



```
---
apiVersion: v1
kind: Pod
metadata:
  name: todo-pod
spec:
  containers:
  - name: todo
    image: minimalkushal/django-todo
    ports:
    - containerPort: 8000
```

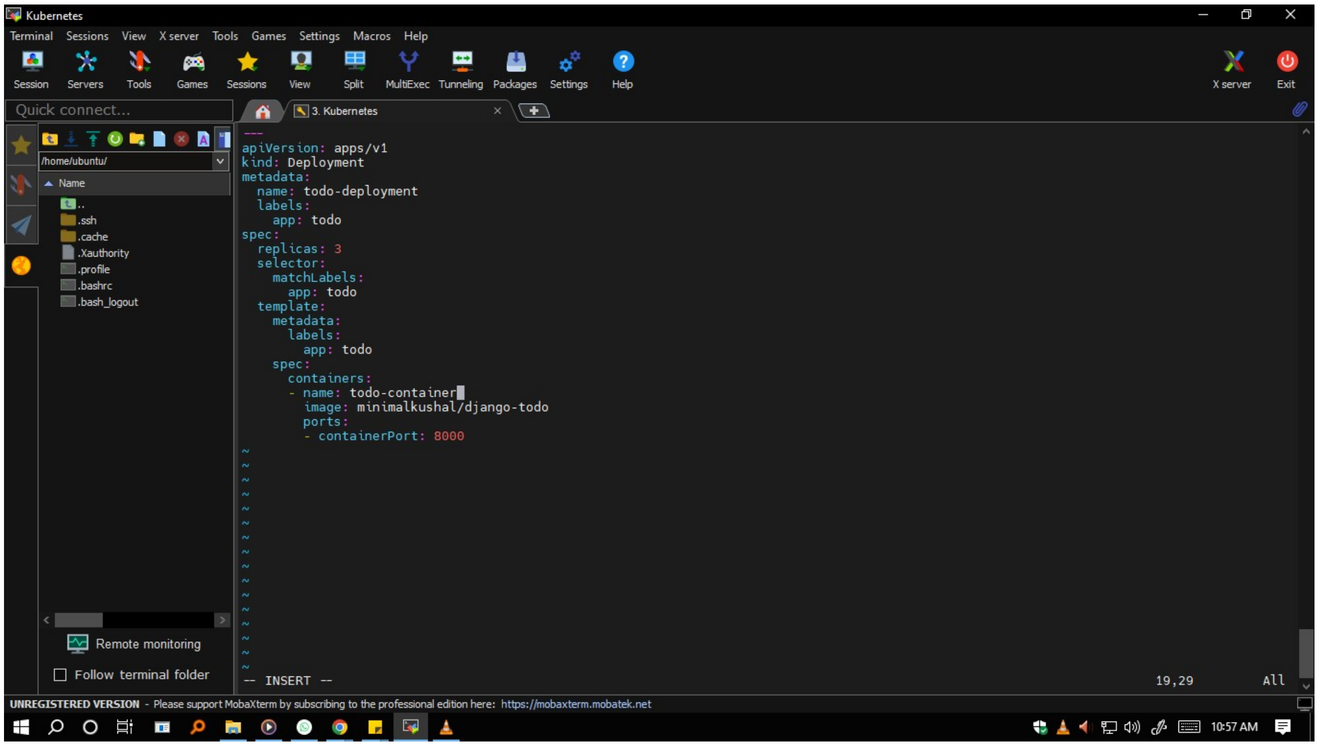
```
-- INSERT --                                                    11,26         All
```

15. Then we apply the manifest file and we get a pod.



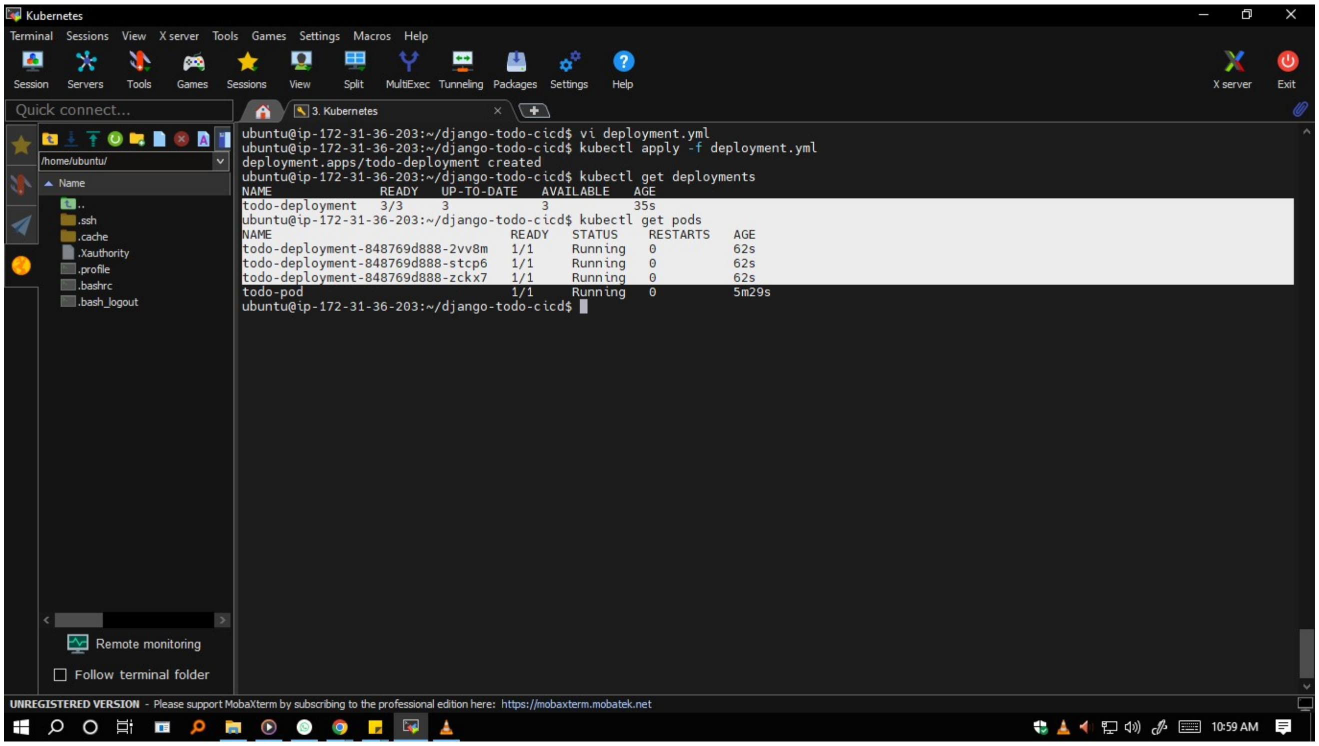
```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl apply -f k8spod.yml
pod/todo-pod created
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl get pod
NAME       READY   STATUS    RESTARTS   AGE
todo-pod   1/1     Running   0          38s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

16. For managing Deployment, creating replicas and Auto-healing we will create a Deployment manifest file.



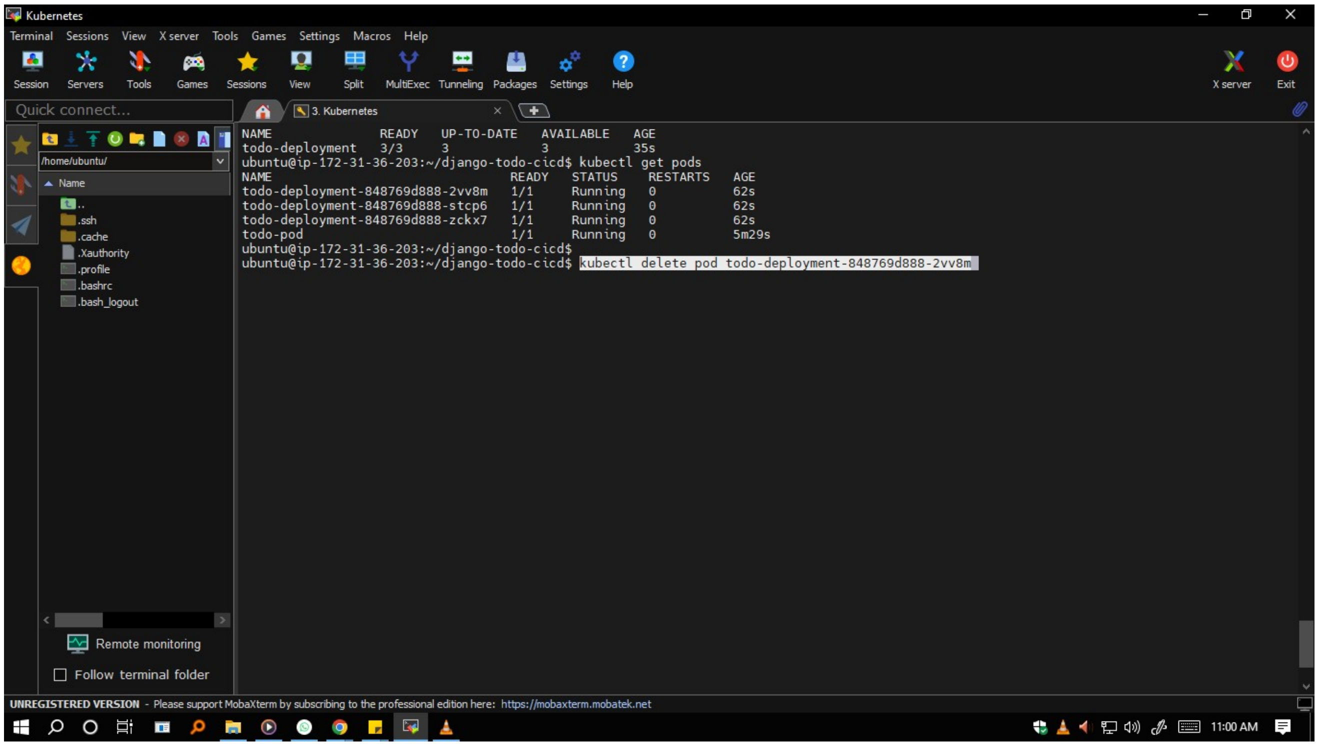
```
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: todo-deployment
  labels:
    app: todo
spec:
  replicas: 3
  selector:
    matchLabels:
      app: todo
  template:
    metadata:
      labels:
        app: todo
    spec:
      containers:
      - name: todo-container
        image: minimalkushal/django-todo
        ports:
        - containerPort: 8000
-- INSERT --                                                          19,29         All
```

17. After applying the Deployment manifest file we can see the Deployment Object has been created.



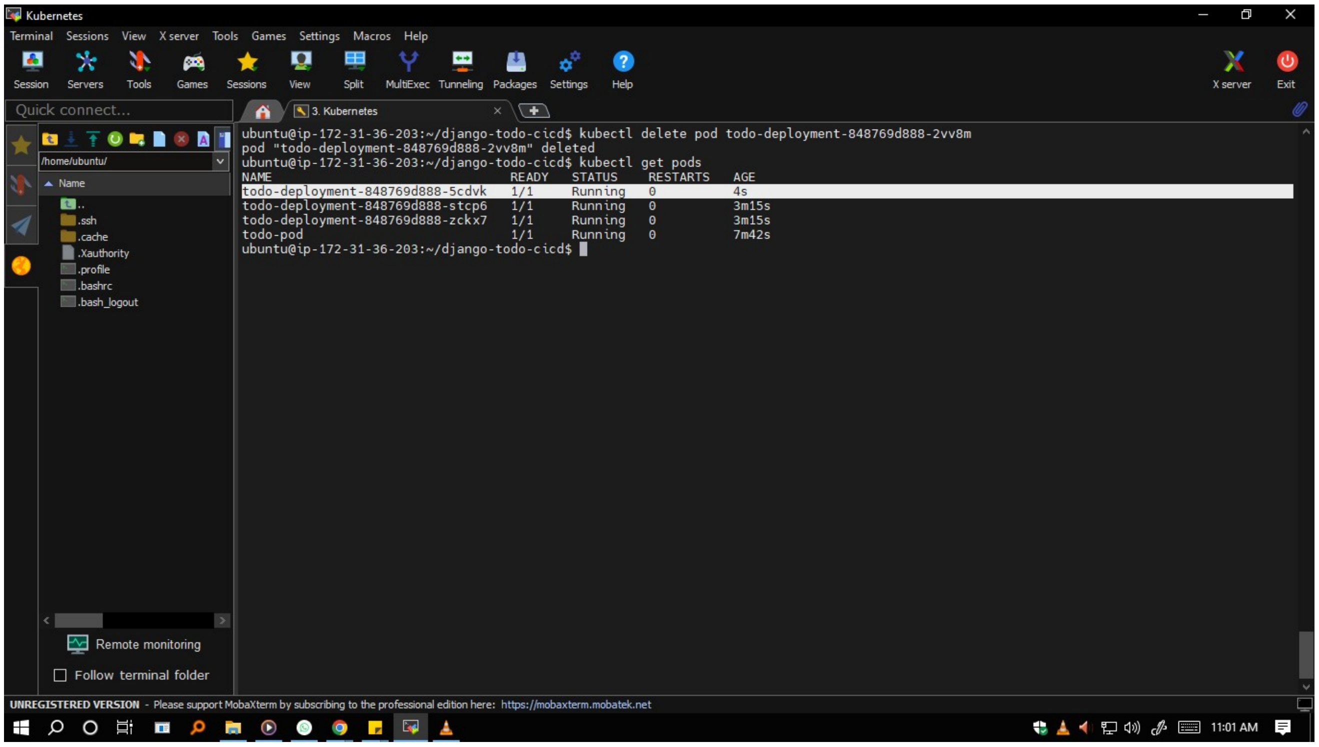
```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ vi deployment.yml
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl apply -f deployment.yml
deployment.apps/todo-deployment created
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl get deployments
NAME              READY   UP-TO-DATE   AVAILABLE   AGE
todo-deployment   3/3     3            3           35s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl get pods
NAME                               READY   STATUS    RESTARTS   AGE
todo-deployment-848769d888-2vv8m   1/1     Running   0          62s
todo-deployment-848769d888-stcp6   1/1     Running   0          62s
todo-deployment-848769d888-zckx7   1/1     Running   0          62s
todo-pod                           1/1     Running   0          5m29s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

18. If we try to delete a pod which is created using the Deployment we will see it heals itself which is called Auto Healing in Kubernetes.



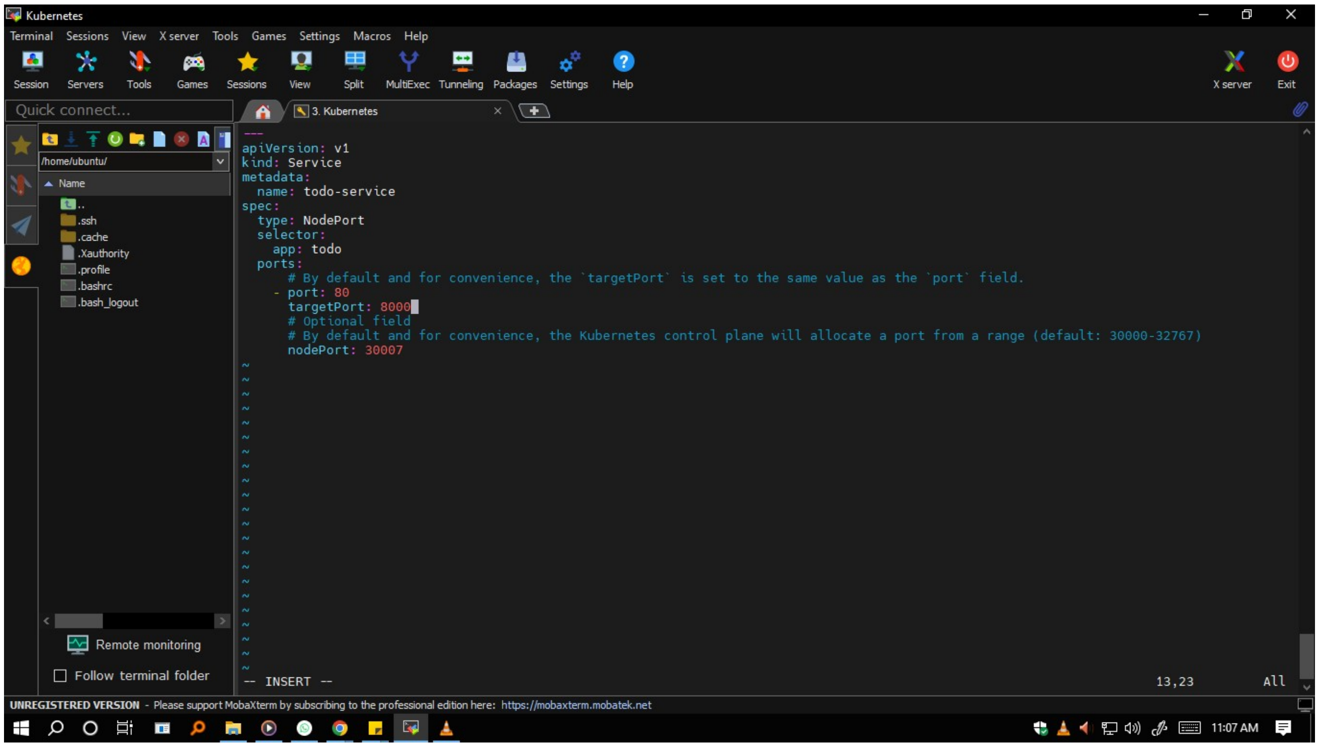
```
NAME              READY   UP-TO-DATE   AVAILABLE   AGE
todo-deployment   3/3     3            3           35s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl get pods
NAME                               READY   STATUS    RESTARTS   AGE
todo-deployment-848769d888-2vv8m   1/1     Running   0          62s
todo-deployment-848769d888-stcp6   1/1     Running   0          62s
todo-deployment-848769d888-zckx7   1/1     Running   0          62s
todo-pod                           1/1     Running   0          5m29s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl delete pod todo-deployment-848769d888-2vv8m
```

19. As we deleted a pod from the Deployment, now we see another new pod has been created automatically.



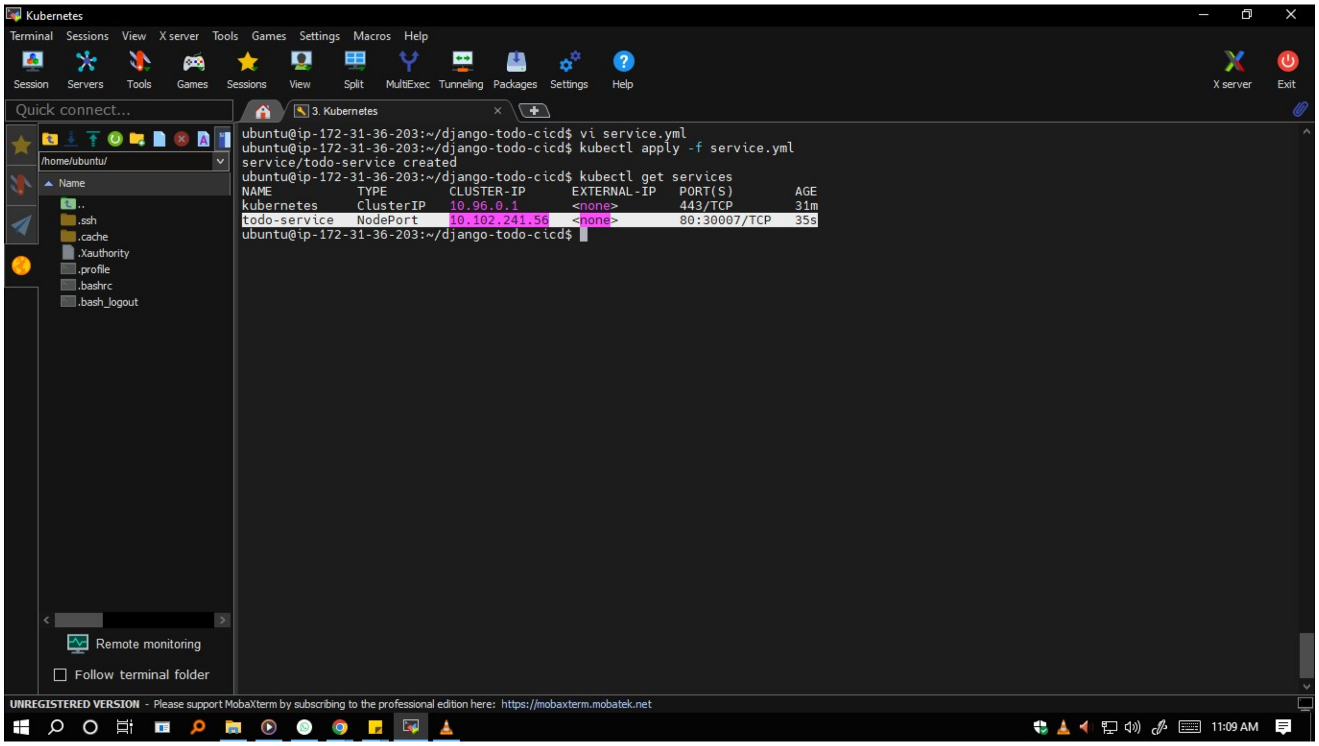
```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl delete pod todo-deployment-848769d888-2vv8m
pod "todo-deployment-848769d888-2vv8m" deleted
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl get pods
NAME                               READY   STATUS    RESTARTS   AGE
todo-deployment-848769d888-5cdvk   1/1     Running   0          4s
todo-deployment-848769d888-stcp6   1/1     Running   0          3m15s
todo-deployment-848769d888-zckx7   1/1     Running   0          3m15s
todo-pod                           1/1     Running   0          7m42s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

20. To expose the ToDo app to public we need to create a Service Manifest and apply it. (But as we are using Minikube we cannot access it from the browser so we will be using the "curl" command)



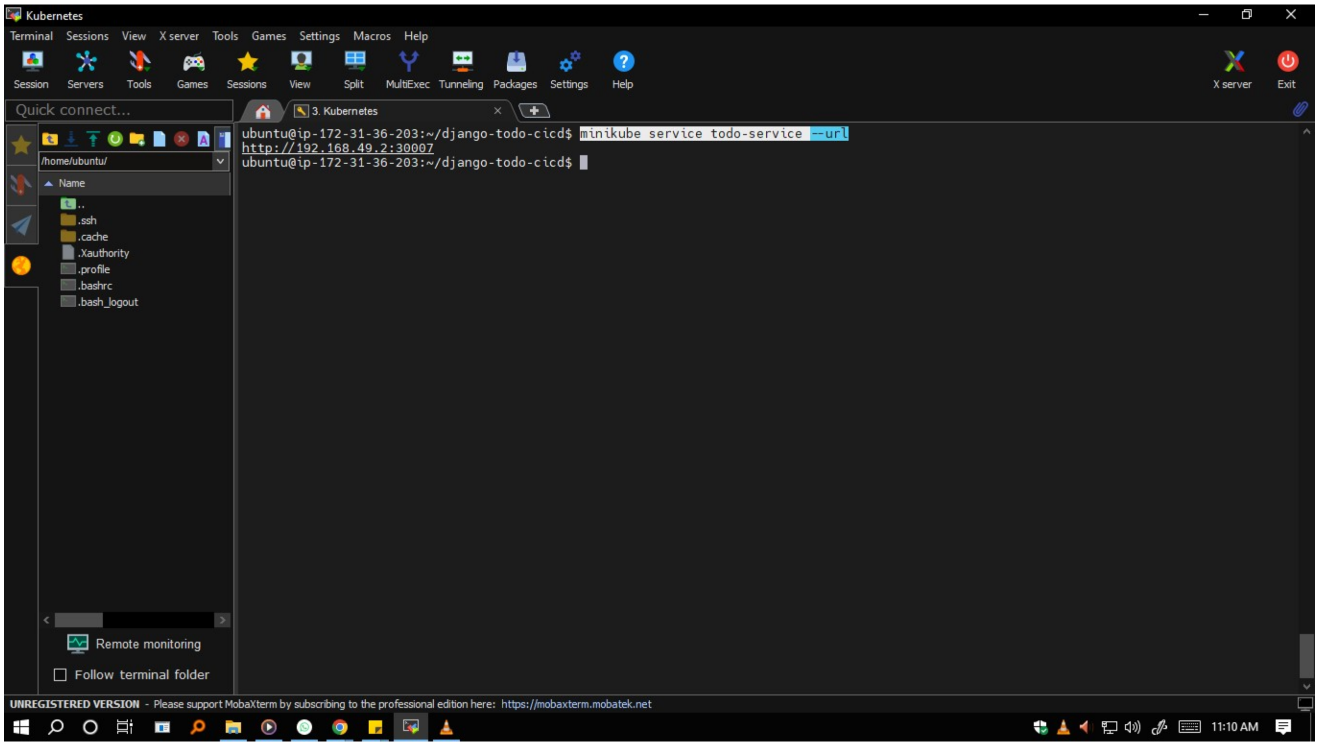
```
---
apiVersion: v1
kind: Service
metadata:
  name: todo-service
spec:
  type: NodePort
  selector:
    app: todo
  ports:
      # By default and for convenience, the `targetPort` is set to the same value as the `port` field.
    - port: 80
      targetPort: 8000
      # Optional field
      # By default and for convenience, the Kubernetes control plane will allocate a port from a range (default: 30000-32767)
      nodePort: 30007
~
-- INSERT --                                                                                    13,23         All
```

21. After applying the Service manifest file we get a Cluster IP but we will not be able to access it from outside the cluster.



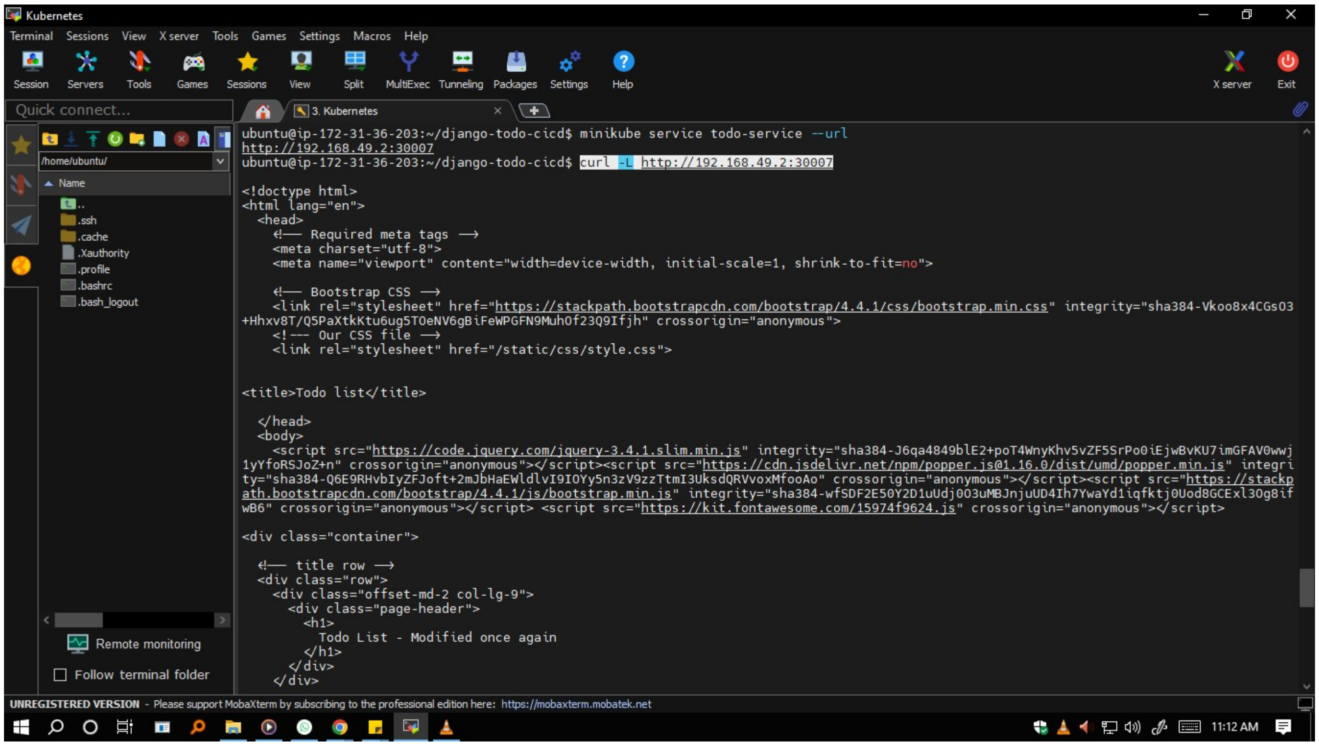
```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ vi service.yml
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl apply -f service.yml
service/todo-service created
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ kubectl get services
NAME           TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
kubernetes     ClusterIP   10.96.0.1       <none>        443/TCP        31m
todo-service   NodePort    10.102.241.56   <none>        80:30007/TCP   35s
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

22. We use the command “minikube service <Sevice-Name> --url” to get the URL using which we can try to access our app using curl command.


Kubernetes
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Quick connect...
3. Kubernetes
/home/ubuntu/
Name
..
.ssh
.cache
.Xauthority
.profile
.bashrc
.bash_logout
Remote monitoring
Follow terminal folder
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net
11:10 AM

```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ minikube service todo-service --url
http://192.168.49.2:30007
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

23. When we try to access the app using curl command we get the response. (Curl command shows only the content not the UI. If we use any other Kubernetes Cluster like MicroK8s or Kubeadm then we will be able to access our app in the browser and interact it with the UI).


Kubernetes
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
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/home/ubuntu/
Name
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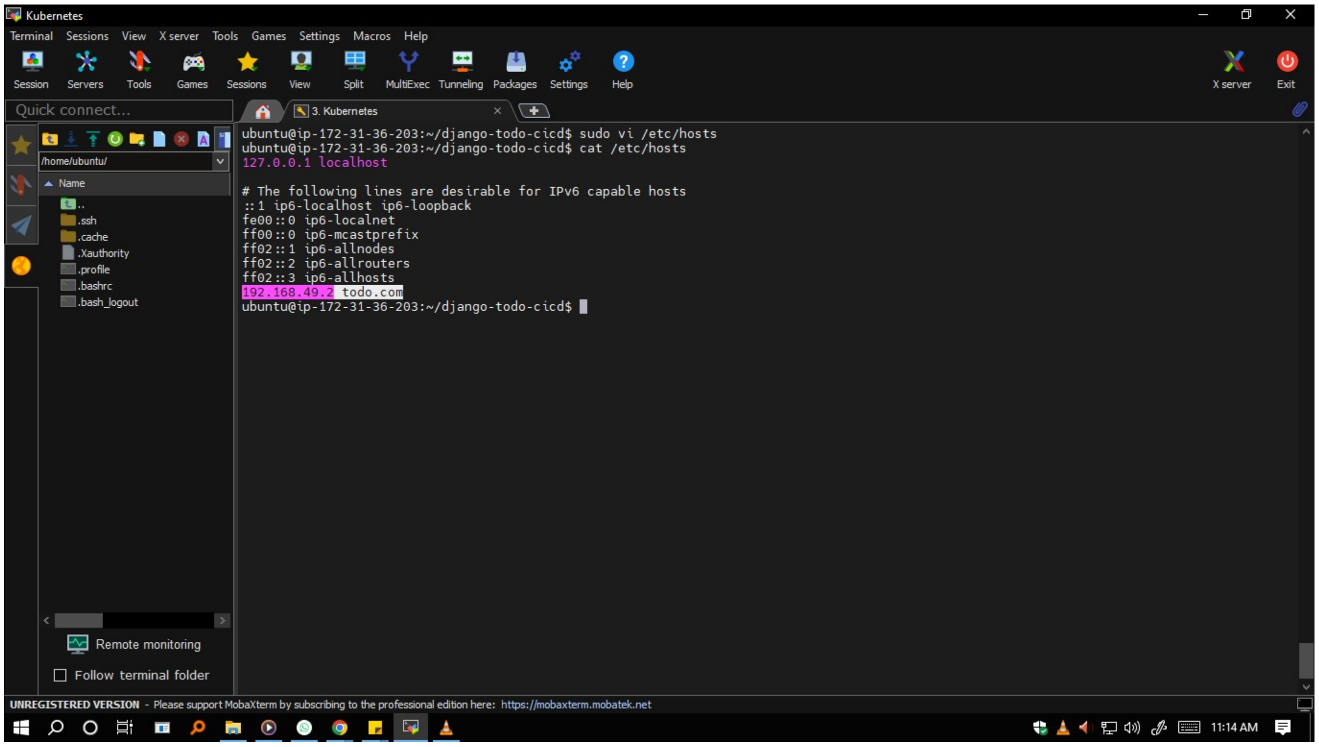
.cache
.Xauthority
.profile
.bashrc
.bash_logout
Remote monitoring
Follow terminal folder
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net
11:12 AM

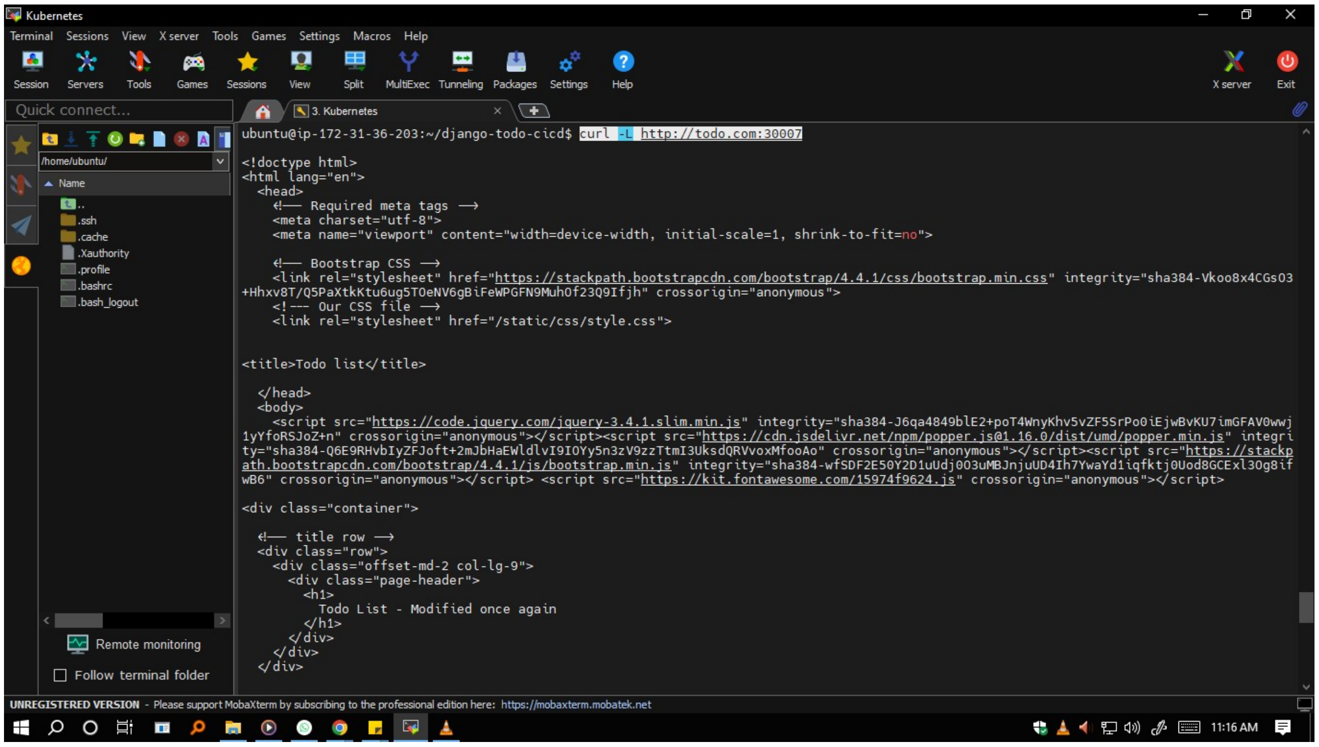
```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ minikube service todo-service --url
http://192.168.49.2:30007
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ curl -L http://192.168.49.2:30007

<!doctype html>
<html lang="en">
  <head>
    <!—— Required meta tags ——>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

    <!—— Bootstrap CSS ——>
    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css" integrity="sha384-Vkoo8x4CGsO3
+Hhxv8T/Q5PaXtkKtu6ug5TOeNV6gBiFeWPGFN9MuhOf23Q9Ifjh" crossorigin="anonymous">
    <!--- Our CSS file ——>
    <link rel="stylesheet" href="/static/css/style.css">


<title>Todo list</title>

  </head>
  <body>
    <script src="https://code.jquery.com/jquery-3.4.1.slim.min.js" integrity="sha384-J6qa4849blE2+poT4WnyKhv5vZF5SrPo0iEjwBvKU7imGFAV0wwj
1yYfoRSJoZ+n" crossorigin="anonymous"></script><script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min.js" integri
ty="sha384-Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRVvoxMfooAo" crossorigin="anonymous"></script><script src="https://stackp
ath.bootstrapcdn.com/bootstrap/4.4.1/js/bootstrap.min.js" integrity="sha384-wfSDF2E50Y2D1uUdj0O3uMBJnjuUD4Ih7YwaYd1iqfktj0Uod8GCExl3Og8if
wB6" crossorigin="anonymous"></script> <script src="https://kit.fontawesome.com/15974f9624.js" crossorigin="anonymous"></script>

<div class="container">

  <!—— title row ——>
  <div class="row">
    <div class="offset-md-2 col-lg-9">
      <div class="page-header">
        <h1>
          Todo List - Modified once again
        </h1>
      </div>
    </div>
```

24. We setup a proxy name for our IP in the host file which can be found in "/etc/hosts" so that we don't need to remember the IP. We can use the name directly. (This domain name as in our example is for our local use only and cannot be used to access from browser if you are using any other Kubernetes Cluster where you are able to view the UI).



```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ sudo vi /etc/hosts
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ cat /etc/hosts
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
192.168.49.2 todo.com
ubuntu@ip-172-31-36-203:~/django-todo-cicd$
```

25. We are able to access the app using the proxy name we entered in the /etc/hosts file.



```
ubuntu@ip-172-31-36-203:~/django-todo-cicd$ curl -L http://todo.com:30007

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<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

    <!-- Bootstrap CSS -->
    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css" integrity="sha384-Vkoo8x4CGsO3
+Hhxv8T/Q5PaXtkKtu6ug5TOeNV6gBiFeWPGFN9MuhOf23Q9Ifjh" crossorigin="anonymous">
    <!--- Our CSS file -->
    <link rel="stylesheet" href="/static/css/style.css">


<title>Todo list</title>

  </head>
  <body>
    <script src="https://code.jquery.com/jquery-3.4.1.slim.min.js" integrity="sha384-J6qa4849blE2+poT4WnyKhv5vZF5SrPo0iEjwBvKU7imGFAV0wwj
1yYfoRSJoZ+n" crossorigin="anonymous"></script><script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min.js" integri
ty="sha384-Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRVvoxMfooAo" crossorigin="anonymous"></script><script src="https://stackp
ath.bootstrapcdn.com/bootstrap/4.4.1/js/bootstrap.min.js" integrity="sha384-wfSDF2E50Y2D1uUdj0O3uMBJnjuUD4Ih7YwaYd1iqfktj0Uod8GCExl3Og8if
wB6" crossorigin="anonymous"></script> <script src="https://kit.fontawesome.com/15974f9624.js" crossorigin="anonymous"></script>

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      </div>
    </div>
  </div>
```