Sicat, Sean Russel

IV – ACSAD

ASSIGNMENT # 5 ELEC 3

1. **Hello Minikube**

   Steps:

   a. Start Minikube

```
PS C:\Windows\system32> minikube start --driver=docker
* minikube v1.37.0 on Microsoft Windows 11 Pro 10.0.26100.7171 Build 26100.7171
* Using the docker driver based on user configuration
* Using Docker Desktop driver with root privileges
* Starting "minikube" primary control-plane node in "minikube" cluster
* Pulling base image v0.0.48 ...
    > gcr.io/k8s-minikube/kicbase...:  488.52 MiB / 488.52 MiB  100.00% 10.70 M
* Creating docker container (CPUs=2, Memory=8000MB) ...
! Failing to connect to https://registry.k8s.io/ from inside the minikube container
* To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking
/proxy/
* Preparing Kubernetes v1.34.0 on Docker 28.4.0 ...
* Configuring bridge CNI (Container Networking Interface) ...
* Verifying Kubernetes components...
  - Using image gcr.io/k8s-minikube/storage-provisioner:v5
* Enabled addons: storage-provisioner, default-storageclass
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

   b. Create a First Deployment

```
PS C:\Windows\system32> kubectl create deployment hello-node --image=registry.k8s.io/e2e-test-images/agnhost:2.53 -- /ag
nhost netexec --http-port=8080
deployment.apps/hello-node created
```

   c. View the Deployment

```
PS C:\Windows\system32> kubectl get deployments
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
hello-node   1/1     1            1           38s
```

   d. Check Pods

```
PS C:\Windows\system32> kubectl get pods
NAME                          READY   STATUS    RESTARTS   AGE
hello-node-6c9b5f4b59-vrz5v   1/1     Running   0          65s
```

   e. Create a Service

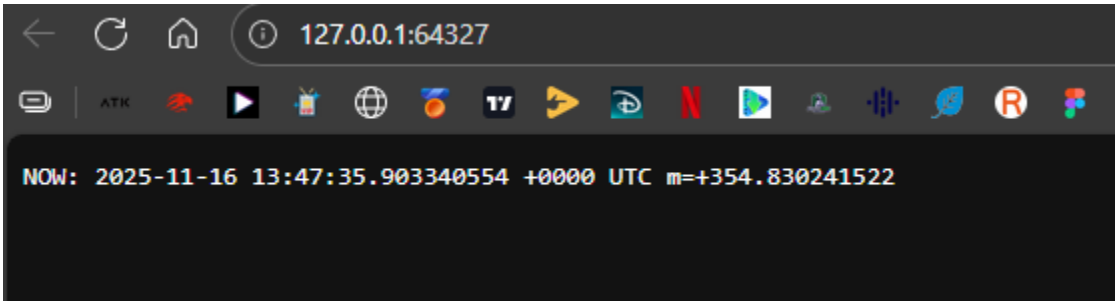
```
PS C:\Windows\system32> kubectl expose deployment hello-node --type=LoadBalancer --port=8080
service/hello-node exposed
```

   f. Check the Service

```
PS C:\Windows\system32> kubectl get services
NAME         TYPE           CLUSTER-IP    EXTERNAL-IP   PORT(S)          AGE
hello-node   LoadBalancer   10.109.2.2    <pending>     8080:31801/TCP   39s
kubernetes   ClusterIP      10.96.0.1     <none>        443/TCP          6m7s
```

g. Check the app's response

```
PS C:\Windows\system32> minikube service hello-node
|-----------|------------|-------------|---------------------------|
| NAMESPACE |    NAME    | TARGET PORT |            URL            |
|-----------|------------|-------------|---------------------------|
| default   | hello-node | 8080        | http://192.168.49.2:31801 |
|-----------|------------|-------------|---------------------------|
* Starting tunnel for service hello-node./
|-----------|------------|-------------|------------------------|
| NAMESPACE |    NAME    | TARGET PORT |          URL           |
|-----------|------------|-------------|------------------------|
| default   | hello-node |             | http://127.0.0.1:64327 |
|-----------|------------|-------------|------------------------|
* Starting tunnel for service hello-node.
* Opening service default/hello-node in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```



2. Get a Shell to a Running Container

Steps

a. Create the Pod

```
PS C:\Windows\system32> kubectl apply -f https://k8s.io/examples/application/shell-demo.yaml
pod/shell-demo created
```

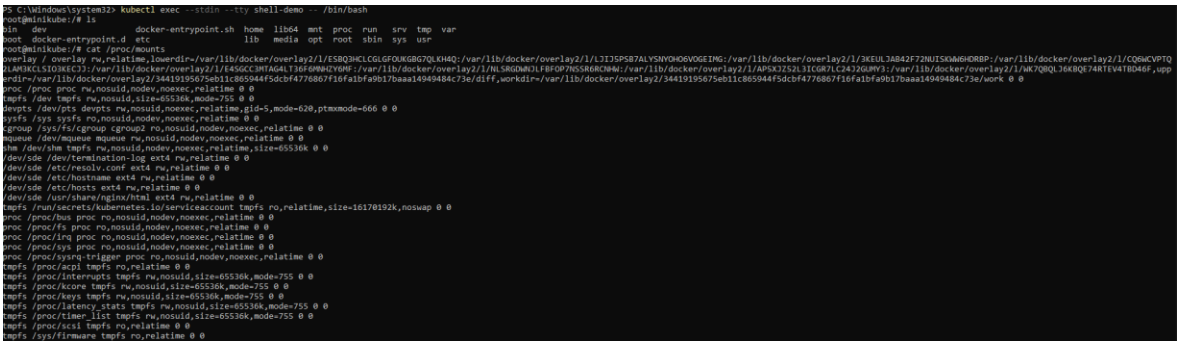
b. Verify that the container is running

```
PS C:\Windows\system32> kubectl get pod shell-demo
NAME         READY   STATUS    RESTARTS   AGE
shell-demo   1/1     Running   0          6m41s
```

c. Get a shell to the running container

```
PS C:\Windows\system32> kubectl exec --stdin --tty shell-demo -- /bin/bash
root@minikube:/#
```

d. Inside the shell run some commands



e. Writing root page page for nginx

```
root@minikube:/# echo "Hello shell demo" > /usr/share/nginx/html/index.html
root@minikube:/# curl http://localhost/
Hello shell demo
```

f. Running individual commands in a container

```
PS C:\Windows\system32> kubectl exec shell-demo -- ls /usr/share/nginx/html
index.html
PS C:\Windows\system32> kubectl exec shell-demo -- cat /usr/share/nginx/html/index.html
Hello shell demo
```

3. Deploying Wordpress and MySQL with persistent volumes

Steps

a. Create a Folder

b. Download the Wordpress and MySQL yaml files from https://kubernetes.io/docs/tutorials/stateful-application/mysql-wordpress-persistent-volume/ and put it in the created folder

c. Create a kustomization.yaml and put this:
secretGenerator: - name: mysql-pass
literals:
- password=YOUR_PASSWORD
resources: - mysql-deployment.yaml - wordpress-deployment.yaml

d. Apply

```
PS C:\wordpressmysql>  kubectl apply -k ./
secret/mysql-pass-hg8bgc6f55 created
service/wordpress created
Warning: spec.SessionAffinity is ignored for headless services
service/wordpress-mysql created
persistentvolumeclaim/mysql-pv-claim created
persistentvolumeclaim/wp-pv-claim created
deployment.apps/wordpress created
deployment.apps/wordpress-mysql created
```

e. Verify Secrets

```
PS C:\wordpressmysql> kubectl get secrets
NAME                  TYPE     DATA   AGE
mysql-pass-hg8bgc6f55   Opaque   1      3m17s
```

f. Verify PersistentVolume

```
PS C:\wordpressmysql> kubectl get pvc
NAME             STATUS   VOLUME                                     CAPACITY   ACCESS MODES   STORAGECLASS   VOLUMEATTRIBUTESCLASS   AGE
mysql-pv-claim   Bound    pvc-7346a9d4-26e4-4bf9-8b34-f6e032496b10   20Gi       RWO            standard       <unset>                 2m9s
wp-pv-claim      Bound    pvc-198439c7-0514-4ab7-8c69-4e45b4388336   20Gi       RWO            standard       <unset>                 2m9s
```

g. Verify Pods

```
PS C:\wordpressmysql> kubectl get pods
NAME                               READY   STATUS    RESTARTS   AGE
hello-node-6c9b5f4b59-spxc7        1/1     Running   0          37s
wordpress-7fcf756d5b-dpbsc         1/1     Running   0          8m29s
wordpress-mysql-d976ff876-fjkh7    1/1     Running   0          8m29s
```

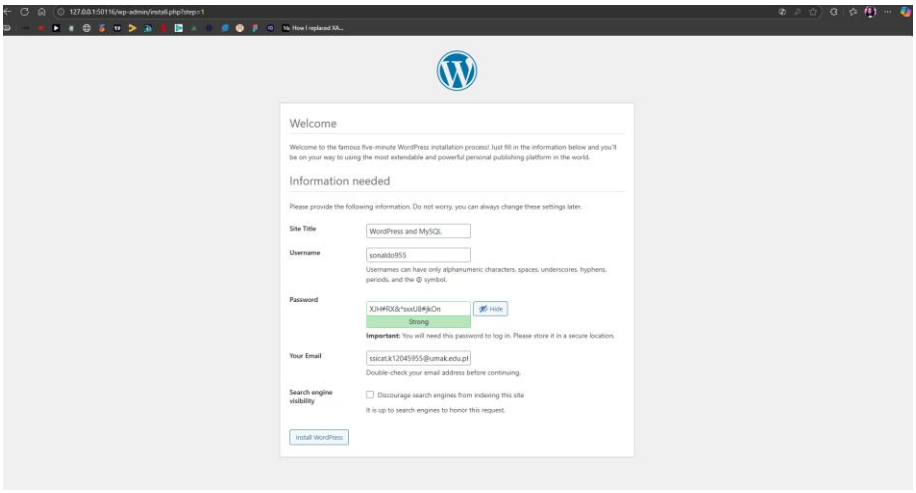
h. Check Services

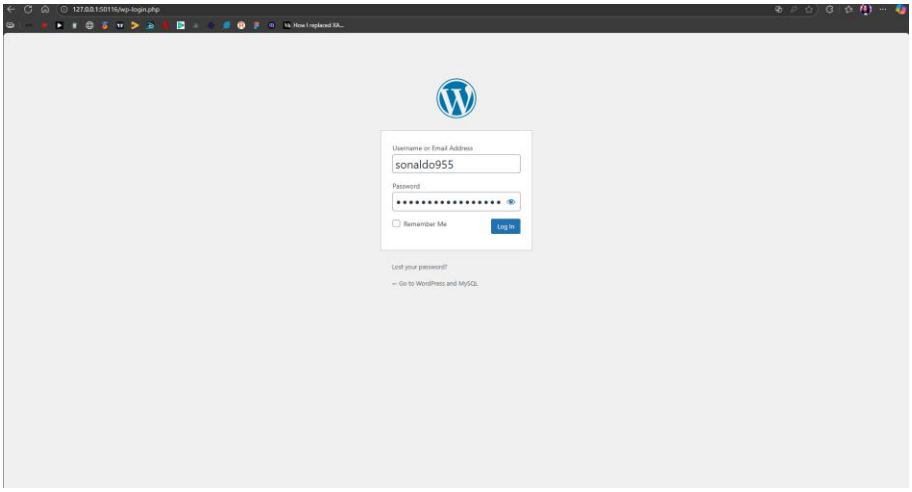
```
PS C:\wordpressmysql> kubectl get services
NAME              TYPE           CLUSTER-IP     EXTERNAL-IP   PORT(S)          AGE
hello-node        LoadBalancer   10.109.2.2     <pending>     8080:31801/TCP   53m
kubernetes        ClusterIP      10.96.0.1      <none>        443/TCP          59m
wordpress         LoadBalancer   10.97.91.225   <pending>     80:32155/TCP     9m25s
wordpress-mysql   ClusterIP      None           <none>        3306/TCP         9m25s
```

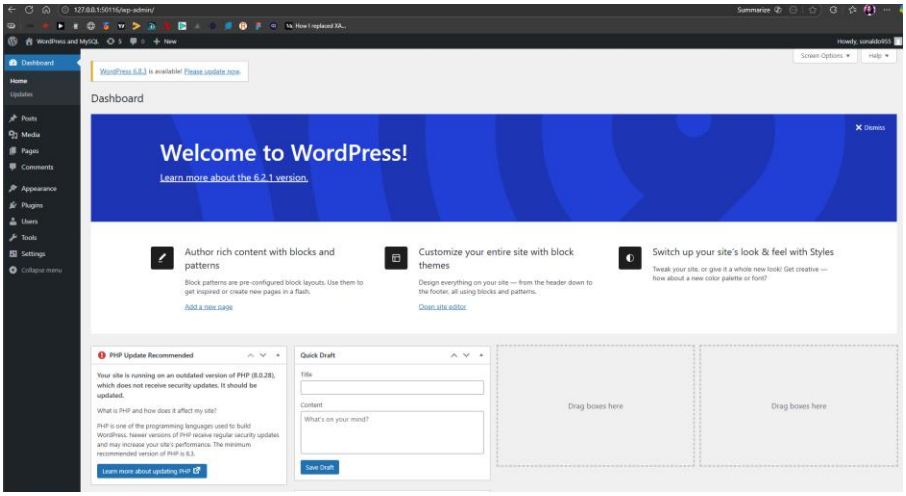
i. Get the url for Wordpress

```
PS C:\wordpressmysql> minikube service wordpress --url
http://127.0.0.1:50116
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```

j. Finish the WordPress Setup from the Browser:







k. Delete the Resources

```
PS C:\wordpressmysql> kubectl delete -k ./
secret "mysql-pass-hg8bgc6f55" deleted from default namespace
service "wordpress" deleted from default namespace
service "wordpress-mysql" deleted from default namespace
persistentvolumeclaim "mysql-pv-claim" deleted from default namespace
persistentvolumeclaim "wp-pv-claim" deleted from default namespace
deployment.apps "wordpress" deleted from default namespace
deployment.apps "wordpress-mysql" deleted from default namespace
```