ASSIGNMENT 2b – KUBERNETES

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1a) Minikube start

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>minikube start
* minikube v1.29.0 on Microsoft Windows 11 Home Single Language 10.0.22621.1265 Build 22621.1265
* Using the docker driver based on existing profile
* Starting control plane node minikube in cluster minikube
* Pulling base image ...
* Updating the running docker "minikube" container ...
* Preparing Kubernetes v1.26.1 on Docker 20.10.23 ...
* 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

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

2a) Get nodes, pods and services command

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get nodes
NAME       STATUS   ROLES           AGE    VERSION
minikube   Ready    control-plane   120m   v1.26.1

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
No resources found in default namespace.

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get services
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   121m

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```

2b) Deployment created

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl create deployment pes1ug20cs588 --image=ng
inx
deployment.apps/pes1ug20cs588 created

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

2c) Get deployment and pod command

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get deployment
NAME           READY   UP-TO-DATE   AVAILABLE   AGE
pes1ug20cs588   1/1     1            1           70s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
NAME                             READY   STATUS    RESTARTS   AGE
pes1ug20cs588-66779f9f65-msqm5   1/1     Running   0          77s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

2d) Editing – 'image: nginx'

```
    spec:
      containers:
      - image: nginx:1.16
        imagePullPolicy: Always
        name: nginx
        resources: {}
        terminationMessagePath: /dev/termination-log
        terminationMessagePolicy: File
      dnsPolicy: ClusterFirst
      restartPolicy: Always
```

2e) Showing edited deployment

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl edit deployment pes1ug20cs588
deployment.apps/pes1ug20cs588 edited

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

2f) Deployment is rolled back

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl rollout undo deployment pes1ug20cs588
deployment.apps/pes1ug20cs588 rolled back
```

2g) Showing original nginx image

```
      labels:
        app: pes1ug20cs588
    spec:
      containers:
      - image: nginx
        imagePullPolicy: Always
        name: nginx
        resources: {}
        terminationMessagePath: /dev/termination-log
        terminationMessagePolicy: File
      dnsPolicy: ClusterFirst
      restartPolicy: Always
      schedulerName: default-scheduler
      securityContext: {}
      terminationGracePeriodSeconds: 30
```

3a) Kubectl logs displayed

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
NAME                              READY   STATUS    RESTARTS   AGE
pes1ug20cs588-66779f9f65-9p2xn    1/1     Running   0          2m12s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl logs pes1ug20cs588-66779f9f65-9p2xn
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2023/02/24 11:05:50 [notice] 1#1: using the "epoll" event method
2023/02/24 11:05:50 [notice] 1#1: nginx/1.23.3
2023/02/24 11:05:50 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2023/02/24 11:05:50 [notice] 1#1: OS: Linux 5.15.79.1-microsoft-standard-WSL2
2023/02/24 11:05:50 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2023/02/24 11:05:50 [notice] 1#1: start worker processes
2023/02/24 11:05:50 [notice] 1#1: start worker process 29
2023/02/24 11:05:50 [notice] 1#1: start worker process 30
2023/02/24 11:05:50 [notice] 1#1: start worker process 31
2023/02/24 11:05:50 [notice] 1#1: start worker process 32
2023/02/24 11:05:50 [notice] 1#1: start worker process 33
2023/02/24 11:05:50 [notice] 1#1: start worker process 34
2023/02/24 11:05:50 [notice] 1#1: start worker process 35
2023/02/24 11:05:50 [notice] 1#1: start worker process 36
2023/02/24 11:05:50 [notice] 1#1: start worker process 37
2023/02/24 11:05:50 [notice] 1#1: start worker process 38
2023/02/24 11:05:50 [notice] 1#1: start worker process 39
2023/02/24 11:05:50 [notice] 1#1: start worker process 40

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```

3b) Kubectl ‘describe pod’ command

```
Events:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  4m6s  default-scheduler  Successfully assigned default/pes1ug20cs588-66779f9f65-9p2xn to minikube
  Normal  Pulling    4m6s  kubelet            Pulling image "nginx"
  Normal  Pulled     4m4s  kubelet            Successfully pulled image "nginx" in 2.573346727s (2.573353414s including waiting)
  Normal  Created    4m4s  kubelet            Created container nginx
  Normal  Started    4m4s  kubelet            Started container nginx

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```

3c) Create mongo deployment

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl exec -it pes1ug20cs588-mongo-558d546d76-vt
rnj -- bin/bash
root@pes1ug20cs588-mongo-558d546d76-vtrnj:/# ls
bin   data  docker-entrypoint-initdb.d  home        lib    lib64   media  opt   root  sbin  sys  usr
boot  dev   etc                        js-yaml.js  lib32  libx32  mnt    proc  run   srv   tmp  var
root@pes1ug20cs588-mongo-558d546d76-vtrnj:/# exit
exit

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

3d) Delete both requirements

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl delete deployment pes1ug20cs588
deployment.apps "pes1ug20cs588" deleted

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl delete deployment pes1ug20cs588-mongo
deployment.apps "pes1ug20cs588-mongo" deleted

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

4a) Kubectl apply command on yaml file

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl apply -f nginx-deployment.yaml
deployment.apps/nginx-deployment-pes1ug20cs588 created
```

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get deployment
NAME                            READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment-pes1ug20cs588   2/2     2            2           17s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
NAME                                             READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug20cs588-8cf4bf97-5h2lt    1/1     Running   0          24s
nginx-deployment-pes1ug20cs588-8cf4bf97-8qzxq    1/1     Running   0          24s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get replicaset
NAME                                       DESIRED   CURRENT   READY   AGE
nginx-deployment-pes1ug20cs588-8cf4bf97    2         2         2       63s
```

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl apply -f nginx-deployment.yaml
deployment.apps/nginx-deployment-pes1ug20cs588 unchanged

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
NAME                                             READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug20cs588-8cf4bf97-5h2lt    1/1     Running   0          2m53s
nginx-deployment-pes1ug20cs588-8cf4bf97-8qzxq    1/1     Running   0          2m53s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get replicaset
NAME                                       DESIRED   CURRENT   READY   AGE
nginx-deployment-pes1ug20cs588-8cf4bf97    2         2         2       3m7s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

4b) Kubectl get on yaml file

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get deployment nginx-deployment-pes1ug20cs
588 -o yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  annotations:
    deployment.kubernetes.io/revision: "1"
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"apps/v1","kind":"Deployment","metadata":{"annotations":{},"labels":{"app":"nginx"},
"name":"nginx-deployment-pes1ug20cs588","namespace":"default"},"spec":{"replicas":2,"selector":{"matchLa
bels":{"app":"nginx"}},"template":{"metadata":{"labels":{"app":"nginx"}},"spec":{"containers":[{"image":
"nginx:1.22","name":"nginx","ports":[{"containerPort":80}]}]}}}}
  creationTimestamp: "2023-02-24T11:22:10Z"
  generation: 1
  labels:
    app: nginx
  name: nginx-deployment-pes1ug20cs588
  namespace: default
  resourceVersion: "4100"
  uid: c1caec7c-b29e-4b96-b8e1-cbca26439b48
spec:
  progressDeadlineSeconds: 600
```

```
status:
  availableReplicas: 2
  conditions:
  - lastTransitionTime: "2023-02-24T11:22:24Z"
    lastUpdateTime: "2023-02-24T11:22:24Z"
    message: Deployment has minimum availability.
    reason: MinimumReplicasAvailable
    status: "True"
    type: Available
  - lastTransitionTime: "2023-02-24T11:22:10Z"
    lastUpdateTime: "2023-02-24T11:22:24Z"
    message: ReplicaSet "nginx-deployment-pes1ug20cs588-8cf4bf97" has successfully
      progressed.
    reason: NewReplicaSetAvailable
    status: "True"
    type: Progressing
  observedGeneration: 1
  readyReplicas: 2
  replicas: 2
  updatedReplicas: 2

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

5a) Deleted pod

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
NAME                                          READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug20cs588-8cf4bf97-5h2lt   1/1     Running   0          7m56s
nginx-deployment-pes1ug20cs588-8cf4bf97-8qzxq   1/1     Running   0          7m56s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl delete pod nginx-deployment-pes1ug20cs588-
8cf4bf97-5h2lt
pod "nginx-deployment-pes1ug20cs588-8cf4bf97-5h2lt" deleted

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod
NAME                                          READY   STATUS    RESTARTS   AGE
nginx-deployment-pes1ug20cs588-8cf4bf97-4rr4l   1/1     Running   0          6s
nginx-deployment-pes1ug20cs588-8cf4bf97-8qzxq   1/1     Running   0          9m53s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

6a) Kubectl apply and get command

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl apply -f nginx-service.yaml
service/nginx-service-pes1ug20cs588 created

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get service
NAME                          TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)    AGE
kubernetes                    ClusterIP   10.96.0.1      <none>        443/TCP    165m
nginx-service-pes1ug20cs588   ClusterIP   10.99.7.142    <none>        8080/TCP   14s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl describe service nginx-service
Name:              nginx-service-pes1ug20cs588
Namespace:         default
Labels:            <none>
Annotations:       <none>
Selector:          app=nginx
Type:              ClusterIP
IP Family Policy:  SingleStack
IP Families:       IPv4
IP:                10.99.7.142
IPs:               10.99.7.142
Port:              <unset>  8080/TCP
TargetPort:        80/TCP
Endpoints:         10.244.0.10:80,10.244.0.9:80
Session Affinity:  None
Events:            <none>
```

6b) Kubectl get pod -o wide command

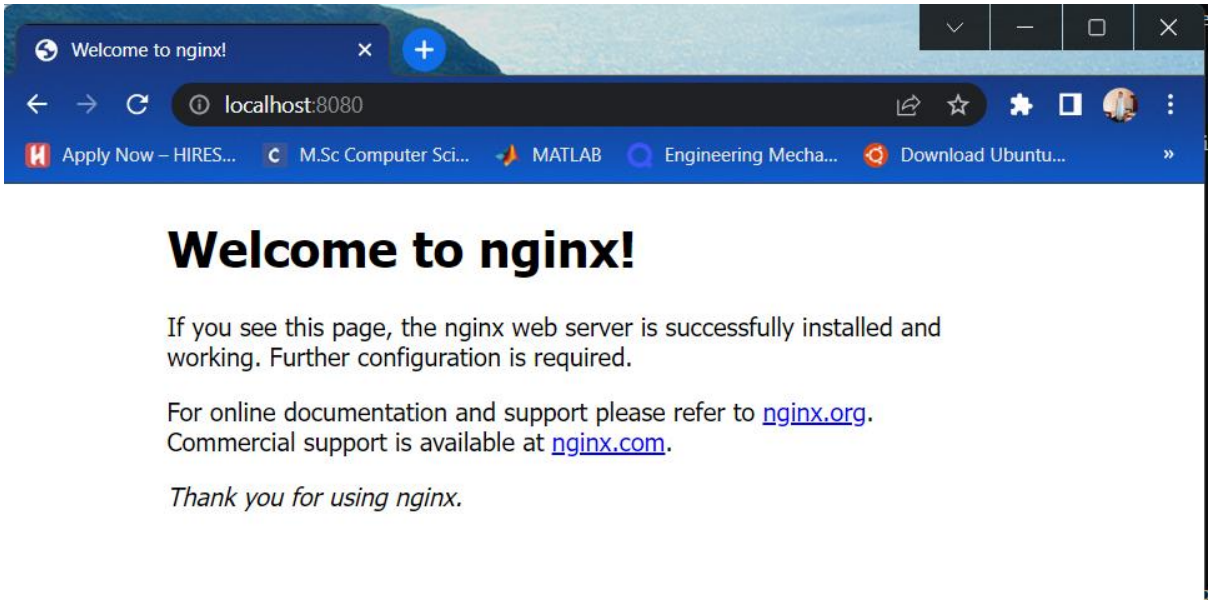
```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get pod -o wide
NAME                                          READY   STATUS    RESTARTS   AGE     IP            NODE
      NOMINATED NODE   READINESS GATES
nginx-deployment-pes1ug20cs588-8cf4bf97-4rr4l   1/1     Running   0          2m12s   10.244.0.10   minik
ube   <none>           <none>
nginx-deployment-pes1ug20cs588-8cf4bf97-8qzxq   1/1     Running   0          11m     10.244.0.9    minik
ube   <none>           <none>

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

7a) Kubectl port-forward command

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl port-forward service/nginx-service-pes1ug2
0cs588 8080:8080
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
```

7b) Display welcome to nginx on webpage



8a) Delete nginx deployments

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl delete deployment nginx-deployment-pes1ug2
0cs588
deployment.apps "nginx-deployment-pes1ug20cs588" deleted

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl delete service nginx-service-pes1ug20cs588

service "nginx-service-pes1ug20cs588" deleted

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

8b) Stop minikube

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>minikube stop
* Stopping node "minikube"  ...
* Powering off "minikube" via SSH ...
* 1 node stopped.

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

9a) The command which exposes specifies the type of service

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl create deployment nginx-pes1ug20cs588 --im
age=nginx --port=80
deployment.apps/nginx-pes1ug20cs588 created
```

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl expose deployment nginx-pes1ug20cs588 --ty
pe=NodePort --name=pes1ug20cs588
service/pes1ug20cs588 exposed

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

9b) Kubectl get service command which displays the node port

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>kubectl get services pes1ug20cs588
NAME           TYPE       CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
pes1ug20cs588   NodePort   10.105.29.212   <none>        80:31283/TCP   77s

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

9c) Minikube IP address

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>minikube ip
192.168.49.2

C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>
```

9d) The webpage with the IP address visible

```
C:\Users\Sahana Rao\Desktop\PES1UG20CS588\SEM6\CC\A2b>minikube service pes1ug20cs588
|-----------|---------------|-------------|--------------------------|
| NAMESPACE |     NAME      | TARGET PORT |            URL           |
|-----------|---------------|-------------|--------------------------|
| default   | pes1ug20cs588 |          80 | http://192.168.49.2:31283 |
|-----------|---------------|-------------|--------------------------|
* Starting tunnel for service pes1ug20cs588.
|-----------|---------------|-------------|------------------------|
| NAMESPACE |     NAME      | TARGET PORT |          URL           |
|-----------|---------------|-------------|------------------------|
| default   | pes1ug20cs588 |             | http://127.0.0.1:61199 |
|-----------|---------------|-------------|------------------------|
* Opening service default/pes1ug20cs588 in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```