

Cloud Computing
Lab 5: Kubernetes Scenario-based – Robots City

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SS1

```
PS C:\Users\Anushree> kubectl get nodes
NAME      STATUS    ROLES      AGE     VERSION
minikube  Ready     control-plane  16m    v1.35.0
PS C:\Users\Anushree> kubectl create namespace pes2ug23cs911-alpha
namespace/pes2ug23cs911-alpha created
PS C:\Users\Anushree> kubectl create namespace pes2ug23cs911-beta
namespace/pes2ug23cs911-beta created
PS C:\Users\Anushree> kubectl get namespaces
NAME        STATUS   AGE
default     Active   18m
kube-node-lease  Active   18m
kube-public   Active   18m
kube-system   Active   18m
pes2ug23cs911-alpha  Active   35s
pes2ug23cs911-beta   Active   16s
PS C:\Users\Anushree>
```

SS2

```
pod/citizen created
PS C:\Users\Anushree> kubectl get pods -n pes2ug23cs911-alpha
NAME      READY    STATUS    RESTARTS   AGE
citizen   1/1      Running   0          105s
PS C:\Users\Anushree> kubectl describe pod citizen
Name:           citizen
Namespace:      pes2ug23cs911-alpha
Priority:       0
Service Account: default
Node:          minikube/192.168.49.2
Start Time:    Thu, 19 Feb 2026 14:57:35 +0530
Labels:         run=citizen
Annotations:   <none>
Status:        Running
IP:            10.244.0.3
IPs:
  IP: 10.244.0.3
Containers:
  citizen:
    Container ID: docker://c3d035e367507d516790c9f5302bc1322d61ec0219ee346f7ab53c5eae91b541
    Image:          nginx
    Image ID:      docker://sha256:5cdef4ac3335f68428701c14c5f12992f5e3669ce8ab7309257d263eb7a856b1
    Port:          <none>
    Host Port:    <none>
    State:        Running
      Started:   Thu, 19 Feb 2026 14:57:36 +0530
    Ready:        True
    Restart Count: 0
    Environment:  <none>
    Mounts:
```

```

Windows PowerShell      Windows PowerShell      anushree@DESKTOP-UN27C8I ~ + 
Environment: <none>
Mounts:
  /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-t65kq (ro)
Conditions:
  Type        Status
  PodReadyToStartContainers  True
  Initialized  True
  Ready       True
  ContainersReady  True
  PodScheduled  True
Volumes:
  kube-api-access-t65kq:
    Type:          Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:   kube-root-ca.crt
    Optional:       false
    DownwardAPI:   true
  QoS Class:      BestEffort
  Node-Selectors: <none>
  Tolerations:   node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                 node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type     Reason     Age     From           Message
  ----     ----     --     --            --
  Normal   Scheduled  2m10s  default-scheduler  Successfully assigned pes2ug23cs911-alpha/citizen to minikube
  Normal   Pulled     2m9s   kubelet        Container image "nginx" already present on machine and can be accessed by the pod
  Normal   Created    2m9s   kubelet        Container created
  Normal   Started    2m9s   kubelet        Container started
PS C:\Users\Anushree>
```

SS3:

```

PS C:\Users\Anushree> kubectl get pods -w
  NAME     READY   STATUS    RESTARTS   AGE
  citizen  1/1     Running   0          3m49s
  temp     0/1     Pending   0          0s
  temp     0/1     Pending   0          0s
  temp     0/1     ContainerCreating  0          0s
  temp     1/1     Running   0          1s
  temp     1/1     Terminating  0          91s
  temp     1/1     Terminating  0          91s
  temp     0/1     Terminating  0          93s
  temp     0/1     Completed   0          94s
  temp     0/1     Completed   0          94s
  temp     0/1     Completed   0          94s
```

SS4:

```
PS C:\Users\Anushree> kubectl logs citizen
/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: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/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
2026/02/19 09:27:37 [notice] 1#1: using the "epoll" event method
2026/02/19 09:27:37 [notice] 1#1: nginx/1.29.5
2026/02/19 09:27:37 [notice] 1#1: built by gcc 14.2.0 (Debian 14.2.0-19)
2026/02/19 09:27:37 [notice] 1#1: OS: Linux 5.15.167.4-microsoft-standard-WSL2
2026/02/19 09:27:37 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2026/02/19 09:27:37 [notice] 1#1: start worker processes
2026/02/19 09:27:37 [notice] 1#1: start worker process 29
2026/02/19 09:27:37 [notice] 1#1: start worker process 30
2026/02/19 09:27:37 [notice] 1#1: start worker process 31
2026/02/19 09:27:37 [notice] 1#1: start worker process 32
2026/02/19 09:27:37 [notice] 1#1: start worker process 33
2026/02/19 09:27:37 [notice] 1#1: start worker process 34
2026/02/19 09:27:37 [notice] 1#1: start worker process 35
2026/02/19 09:27:37 [notice] 1#1: start worker process 36
2026/02/19 09:27:37 [notice] 1#1: start worker process 37
2026/02/19 09:27:37 [notice] 1#1: start worker process 38
2026/02/19 09:27:37 [notice] 1#1: start worker process 39
2026/02/19 09:27:37 [notice] 1#1: start worker process 40
2026/02/19 09:27:37 [notice] 1#1: start worker process 41
2026/02/19 09:27:37 [notice] 1#1: start worker process 42
2026/02/19 09:27:37 [notice] 1#1: start worker process 43
2026/02/19 09:27:37 [notice] 1#1: start worker process 44
2026/02/19 09:27:37 [notice] 1#1: start worker process 45
2026/02/19 09:27:37 [notice] 1#1: start worker process 46
2026/02/19 09:27:37 [notice] 1#1: start worker process 47
2026/02/19 09:27:37 [notice] 1#1: start worker process 48
2026/02/19 09:27:37 [notice] 1#1: start worker process 49
2026/02/19 09:27:37 [notice] 1#1: start worker process 50
PS C:\Users\Anushree> |
```

SS5

```
PS C:\Users\Anushree> kubectl run broken \
>> --image=busybox \
>> --image-pull-policy=Never \
>> --restart=Never \
>> --command -- sh -c "echo 'CRASH: something went wrong' >&2; exit 1"
pod/broken created
PS C:\Users\Anushree> kubectl logs broken
CRASH: something went wrong
PS C:\Users\Anushree>
```

SS6:

```
deployment.apps/pes2ug23cs911 created
PS C:\Users\Anushree> kubectl get deployments -n pes2ug23cs911-alpha
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
pes2ug23cs911   1/1     1           1           32s
PS C:\Users\Anushree> kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
broken         0/1     Error     0          18m
citizen        1/1     Running   0          26m
pes2ug23cs911-774899ffd5-zq9xp  1/1     Running   0          70s
PS C:\Users\Anushree>
```

SS7

```
PS C:\Users\Anushree> kubectl scale deployment pes2ug23cs911 --replicas=5
deployment.apps/pes2ug23cs911 scaled
PS C:\Users\Anushree> kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
broken        0/1     Error     0          19m
citizen       1/1     Running   0          27m
pes2ug23cs911-774899ffd5-5c5wg  1/1     Running   0          10s
pes2ug23cs911-774899ffd5-5gjmm  1/1     Running   0          10s
pes2ug23cs911-774899ffd5-8xzls  1/1     Running   0          10s
pes2ug23cs911-774899ffd5-z98kh  1/1     Running   0          10s
pes2ug23cs911-774899ffd5-zq9xp  1/1     Running   0          2m33s
PS C:\Users\Anushree> kubectl scale deployment pes2ug23cs911 --replicas=3
deployment.apps/pes2ug23cs911 scaled
PS C:\Users\Anushree> kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
broken        0/1     Error     0          20m
citizen       1/1     Running   0          28m
pes2ug23cs911-774899ffd5-5c5wg  1/1     Running   0          47s
pes2ug23cs911-774899ffd5-8xzls  1/1     Running   0          47s
pes2ug23cs911-774899ffd5-zq9xp  1/1     Running   0          3m10s
PS C:\Users\Anushree>
```

SS8:

```
PS C:\Users\Anushree> kubectl set image deployment/pes2ug23cs911 nginx=nginx
deployment.apps/pes2ug23cs911 image updated
PS C:\Users\Anushree> kubectl get rs,po
NAME           DESIRED   CURRENT   READY   AGE
replicaset.apps/pes2ug23cs911-774899ffd5  1         1         1      9m54s
replicaset.apps/pes2ug23cs911-85c75b88b9  3         3         2      7s

NAME          READY   STATUS    RESTARTS   AGE
pod/broken    0/1     Error     0          26m
pod/citizen   1/1     Running   0          34m
pod/pes2ug23cs911-774899ffd5-zq9xp  1/1     Running   0          9m54s
pod/pes2ug23cs911-85c75b88b9-424r4  1/1     Running   0          5s
pod/pes2ug23cs911-85c75b88b9-7tq8c  1/1     Running   0          7s
pod/pes2ug23cs911-85c75b88b9-kfx8k  0/1     ContainerCreating  0          3s
PS C:\Users\Anushree> kubectl get rs,po
NAME           DESIRED   CURRENT   READY   AGE
replicaset.apps/pes2ug23cs911-774899ffd5  0         0         0      10m
replicaset.apps/pes2ug23cs911-85c75b88b9  3         3         3      14s

NAME          READY   STATUS    RESTARTS   AGE
pod/broken    0/1     Error     0          27m
pod/citizen   1/1     Running   0          34m
pod/pes2ug23cs911-85c75b88b9-424r4  1/1     Running   0          12s
pod/pes2ug23cs911-85c75b88b9-7tq8c  1/1     Running   0          14s
pod/pes2ug23cs911-85c75b88b9-kfx8k  1/1     Running   0          10s
PS C:\Users\Anushree>
```

```

PS C:\Users\Anushree> kubectl get rs,po
NAME                                DESIRED   CURRENT   READY    AGE
replicaset.apps/pes2ug23cs911-774899ffd5  0         0         0      10m
replicaset.apps/pes2ug23cs911-85c75b88b9  3         3         3      14s

NAME                               READY   STATUS    RESTARTS   AGE
pod/broken                         0/1    Error     0       27m
pod/citizen                         1/1    Running   0       34m
pod/pes2ug23cs911-85c75b88b9-424r4  1/1    Running   0       12s
pod/pes2ug23cs911-85c75b88b9-7tq8c  1/1    Running   0       14s
pod/pes2ug23cs911-85c75b88b9-kfx8k  1/1    Running   0       10s
PS C:\Users\Anushree> kubectl set image deployment/pes2ug23cs911 nginx=nginx:1.25
deployment.apps/pes2ug23cs911 image updated
PS C:\Users\Anushree> kubectl get rs,po
NAME                                DESIRED   CURRENT   READY    AGE
replicaset.apps/pes2ug23cs911-774899ffd5  3         3         3      11m
replicaset.apps/pes2ug23cs911-85c75b88b9  0         0         0      110s

NAME                               READY   STATUS    RESTARTS   AGE
pod/broken                         0/1    Error     0       28m
pod/citizen                         1/1    Running   0       36m
pod/pes2ug23cs911-774899ffd5-64d42  1/1    Running   0       6s
pod/pes2ug23cs911-774899ffd5-9zn58  1/1    Running   0       4s
pod/pes2ug23cs911-774899ffd5-s6kqq  1/1    Running   0       8s
pod/pes2ug23cs911-85c75b88b9-kfx8k  0/1    Completed  0       106s
PS C:\Users\Anushree> kubectl get rs,po
NAME                                DESIRED   CURRENT   READY    AGE
replicaset.apps/pes2ug23cs911-774899ffd5  3         3         3      11m
replicaset.apps/pes2ug23cs911-85c75b88b9  0         0         0      115s

NAME                               READY   STATUS    RESTARTS   AGE
pod/broken                         0/1    Error     0       28m
pod/citizen                         1/1    Running   0       36m
pod/pes2ug23cs911-774899ffd5-64d42  1/1    Running   0       11s
pod/pes2ug23cs911-774899ffd5-9zn58  1/1    Running   0       9s
pod/pes2ug23cs911-774899ffd5-s6kqq  1/1    Running   0       13s
PS C:\Users\Anushree>

```

SS9

```
PS C:\Users\Anushree> kubectl rollout history deployment pes2ug23cs911 -n pes2ug23cs911-alpha
deployment.apps/pes2ug23cs911
REVISION  CHANGE-CAUSE
3          <none>
4          <none>

PS C:\Users\Anushree> kubectl rollout history deployment pes2ug23cs911 --revision=3 -n pes2ug23cs911-alpha
deployment.apps/pes2ug23cs911 with revision #3
Pod Template:
  Labels:      app=pes2ug23cs911
                pod-template-hash=774899fffd5
  Containers:
    nginx:
      Image:      nginx:1.25
      Port:       <none>
      Host Port:  <none>
      Environment: <none>
      Mounts:     <none>
      Volumes:   <none>
      Node-Selectors: <none>
      Tolerations: <none>

PS C:\Users\Anushree> kubectl rollout history deployment pes2ug23cs911 --revision=4 -n pes2ug23cs911-alpha
deployment.apps/pes2ug23cs911 with revision #4
Pod Template:
  Labels:      app=pes2ug23cs911
                pod-template-hash=85c75b88b9
  Containers:
    nginx:
      Image:      nginx
      Port:       <none>
      Host Port:  <none>
      Environment: <none>
      Mounts:     <none>
      Volumes:   <none>
      Node-Selectors: <none>
      Tolerations: <none>

PS C:\Users\Anushree>
```

SS10

```
PS C:\Users\Anushree\PES2UG23CS911> notepad nginx-pes2ug23cs911.yaml
PS C:\Users\Anushree\PES2UG23CS911> kubectl apply -f nginx-pes2ug23cs911.yaml -n pes2ug23cs911-beta
deployment.apps/nginx-pes2ug23cs911 created
PS C:\Users\Anushree\PES2UG23CS911> kubectl config set-context --current --namespace=pes2ug23cs911-beta
error: you cannot specify both a context name and --current
PS C:\Users\Anushree\PES2UG23CS911> kubectl get deployments
NAME        READY   UP-TO-DATE   AVAILABLE   AGE
pes2ug23cs911  3/3     3           3           29m
PS C:\Users\Anushree\PES2UG23CS911>
```

SS11

```
PS C:\Users\Anushree\PES2UG23CS911> notepad pes2ug23cs911-service.yaml
PS C:\Users\Anushree\PES2UG23CS911> kubectl apply -f pes2ug23cs911-service.yaml
service/pes2ug23cs911-service created
PS C:\Users\Anushree\PES2UG23CS911> kubectl get services -n pes2ug23cs911-beta
NAME          TYPE        CLUSTER-IP      EXTERNAL-IP     PORT(S)      AGE
pes2ug23cs911-service   ClusterIP   10.109.165.102 <none>        80/TCP       41s
PS C:\Users\Anushree\PES2UG23CS911> kubectl describe service pes2ug23cs911-service -n pes2ug23cs911-beta
Name:           pes2ug23cs911-service
Namespace:      pes2ug23cs911-beta
Labels:         <none>
Annotations:    <none>
Selector:       app=nginx
Type:          ClusterIP
IP Family Policy: SingleStack
IP Families:   IPv4
IP:             10.109.165.102
IPs:            10.109.165.102
Port:           <unset>  80/TCP
TargetPort:     80/TCP
Endpoints:      10.244.0.23:80,10.244.0.25:80,10.244.0.24:80
Session Affinity: None
Internal Traffic Policy: Cluster
Events:         <none>
PS C:\Users\Anushree\PES2UG23CS911> kubectl get endpoints pes2ug23cs911-service -n pes2ug23cs911-beta
Warning: v1 Endpoints is deprecated in v1.33+; use discovery.k8s.io/v1 EndpointSlice
NAME          ENDPOINTS      AGE
pes2ug23cs911-service  10.244.0.23:80,10.244.0.24:80,10.244.0.25:80  83s
PS C:\Users\Anushree\PES2UG23CS911>
```

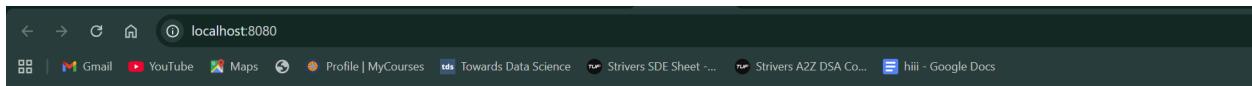
SS12

```
PS C:\Users\Anushree\PES2UG23CS911> kubectl delete pod -l app=nginx
pod "nginx-pes2ug23cs911-774dc57ddf-65jw5" deleted from pes2ug23cs911-beta namespace
pod "nginx-pes2ug23cs911-774dc57ddf-gwt86" deleted from pes2ug23cs911-beta namespace
pod "nginx-pes2ug23cs911-774dc57ddf-qwwmt" deleted from pes2ug23cs911-beta namespace
PS C:\Users\Anushree\PES2UG23CS911> kubectl get endpoints pes2ug23cs911-service
Warning: v1 Endpoints is deprecated in v1.33+; use discovery.k8s.io/v1 EndpointSlice
NAME          ENDPOINTS      AGE
pes2ug23cs911-service  10.244.0.26:80,10.244.0.27:80,10.244.0.28:80  2m59s
PS C:\Users\Anushree\PES2UG23CS911> kubectl describe service pes2ug23cs911-service
Name:           pes2ug23cs911-service
Namespace:      pes2ug23cs911-beta
Labels:         <none>
Annotations:    <none>
Selector:       app=nginx
Type:          ClusterIP
IP Family Policy: SingleStack
IP Families:   IPv4
IP:             10.109.165.102
IPs:            10.109.165.102
Port:           <unset>  80/TCP
TargetPort:     80/TCP
Endpoints:      10.244.0.26:80,10.244.0.28:80,10.244.0.27:80
Session Affinity: None
Internal Traffic Policy: Cluster
Events:         <none>
PS C:\Users\Anushree\PES2UG23CS911>
```

SS13

```
Events:          <none>
PS C:\Users\Anushree\PES2UG23CS911> kubectl port-forward deployment/nginx-pes2ug23cs911 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [:1]:8080 -> 80
Handling connection for 8080
Handling connection for 8080
```

SS14



Hello from district PES2UG23CS911-beta running in Kubernetes

SS15

```
PS C:\Users\Anushree\PES2UG23CS911> kubectl delete namespace pes2ug23cs911-alpha
namespace "pes2ug23cs911-alpha" deleted
PS C:\Users\Anushree\PES2UG23CS911> kubectl delete namespace pes2ug23cs911-beta
namespace "pes2ug23cs911-beta" deleted
PS C:\Users\Anushree\PES2UG23CS911> kubectl get ns
NAME      STATUS   AGE
default   Active   87m
kube-node-lease Active   87m
kube-public  Active   87m
kube-system  Active   87m
PS C:\Users\Anushree\PES2UG23CS911> |
```