🚀 EKS Cluster Upgrade & Blue-Green Node Upgrade (Production Way) — Using Cordon + Drain (No nodeSelector)

For this i deployed application Before upgrading the Cluster and Nodes, To show that the applications still up and running

```
[ ec2-user@ip-172-31-90-11 ~/Helm/expense-helm/frontend ]$ kubectl get pods
NAME                        READY   STATUS    RESTARTS   AGE
backend-84b755f586-2q95g    1/1     Running   0          44m
backend-84b755f586-7zw2j    1/1     Running   0          44m
frontend-7c44f58b66-5v7zc   1/1     Running   0          37m
frontend-7c44f58b66-8rc55   1/1     Running   0          37m
mysql-0                     1/1     Running   0          54m
mysql-1                     1/1     Running   0          49m
mysql-2                     1/1     Running   0          48m

34.230.38.116 | 172.31.90.11 | m7i-flex.large | https://github.com/Prakashreddy14306/Helm.git
```

✅ The best approach is **Blue → Green upgrade** using:

- **cordon**
- **drain**
- **delete nodegroup**

👉 No changes required in Deployments / Helm charts.

✅ Step-by-Step Process (eksctl)

1️⃣ Create EKS Cluster with BLUE NodeGroup

`eksctl create cluster -f cluster.yaml`

```yaml
apiVersion: eksctl.io/v1alpha5
kind: ClusterConfig

metadata:
  name: expense
  region: us-east-1
  version: "1.29"

managedNodeGroups:
  - name: blue-ng
    instanceTypes: ["c7i-flex.large", "m7i-flex.large"]
    desiredCapacity: 3
    minSize: 3
    maxSize: 6
    spot: true
    labels:
      color: blue
```

```
eksctl create cluster -f cluster.yaml
```

* To view the cluster version

```
34.230.38.116 | 172.31.90.11 | m7i-flex.large | https://github.com/Prakashreddy14306/Helm.git
[ ec2-user@ip-172-31-90-11 ~/Helm/expense-helm/mysql ]$ aws eks describe-cluster --name expense --region us-east-1 --query "cluster.version"
"1.29"
```

```
This image is designed for only for the lab purpose
of learning DevOps and not recommended at all to use
in production or any company environments.

Last login: Sun Feb 15 10:35:43 2026 from 124.123.173.124

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~ ]$

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~ ]$ kubectl get nodes
NAME                           STATUS   ROLES    AGE     VERSION
ip-192-168-39-158.ec2.internal   Ready    <none>   3h56m   v1.29.15-eks-70ce843
ip-192-168-5-218.ec2.internal    Ready    <none>   3h56m   v1.29.15-eks-70ce843
ip-192-168-53-225.ec2.internal   Ready    <none>   3h56m   v1.29.15-eks-70ce843
```

2 Upgrade EKS Control Plane

Now we are running cluster `1.29 and we upgrade this to 1.30`

```
eksctl upgrade cluster \
  --name expense \
  --region us-east-1 \
  --version 1.30 \
  --approve
```

```
34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~ ]$ eksctl upgrade cluster \
  --name expense \
  --region us-east-1 \
  --version 1.30 \
  --approve
2026-02-15 13:35:47 [ℹ]  will upgrade cluster "expense" control plane from current version "1.29" to "1.30"
2026-02-15 13:43:22 [✔]  cluster "expense" control plane has been upgraded to version "1.30"
2026-02-15 13:43:22 [ℹ]  you will need to follow the upgrade procedure for all of nodegroups and add-ons
2026-02-15 13:43:23 [ℹ]  re-building cluster stack "eksctl-expense-cluster"
2026-02-15 13:43:23 [✔]  all resources in cluster stack "eksctl-expense-cluster" are up-to-date
2026-02-15 13:43:23 [ℹ]  checking security group configuration for all nodegroups
2026-02-15 13:43:23 [ℹ]  all nodegroups have up-to-date cloudformation templates

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~ ]$ aws eks describe-cluster --name expense --region us-east-1 --query "cluster.version"
"1.30"

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~ ]$
```

3 Create GREEN NodeGroup

```
eksctl create nodegroup -f green-ng.yaml
```

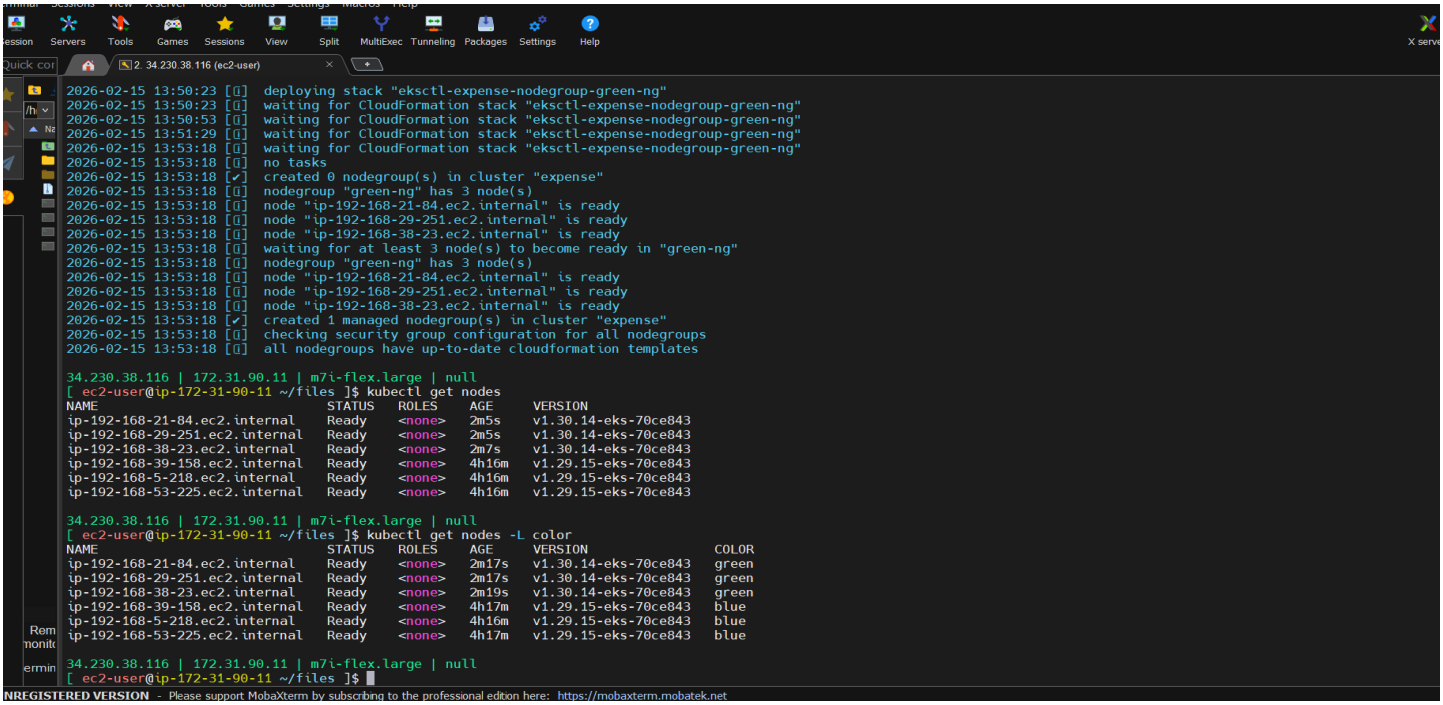
```yaml
apiVersion: eksctl.io/v1alpha5
kind: ClusterConfig

metadata:
  name: expense
  region: us-east-1
  version: "1.30"
```

```
managedNodeGroups:
  - name: green-ng
    instanceTypes: ["c7i-flex.large", "m7i-flex.large"]
    desiredCapacity: 3
    minSize: 3
    maxSize: 6
    spot: true
    labels:
      color: green
```

Now cluster has:

- **blue-ng** (old nodes)
- **green-ng** (new nodes)



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4 Cordon BLUE Nodes (Stop Scheduling New Pods)

Get nodes:

```
kubectl get nodes -L eksctl.io/nodegroup
```

Cordon blue nodes:

```
kubectl cordon <blue-node1>
kubectl cordon <blue-node2>
kubectl cordon <blue-node3>
```

Check status:

```
kubectl get nodes
```

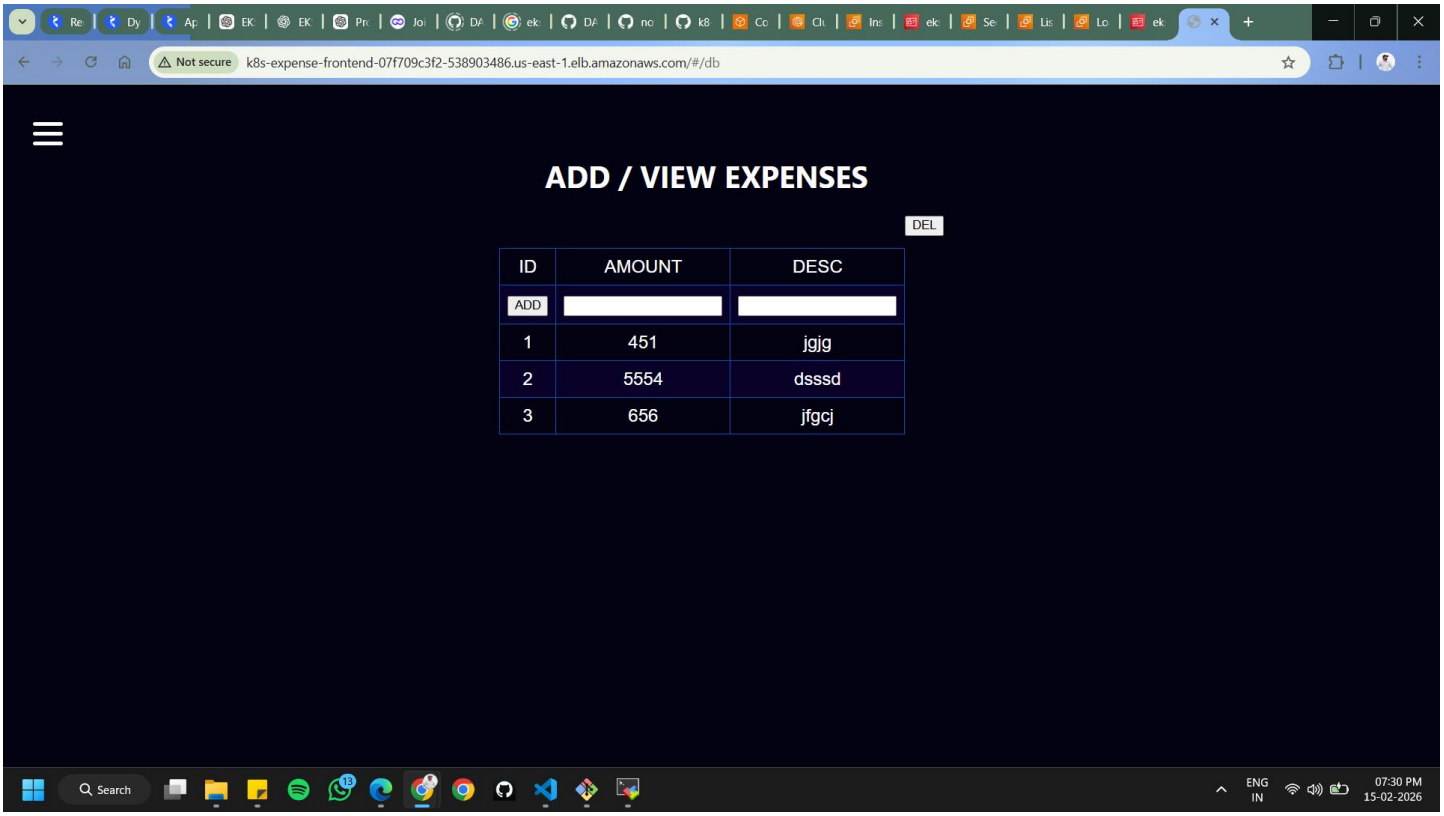
You'll see:

```
SchedulingDisabled
```

```
34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$ kubectl cordon ip-192-168-39-158.ec2.internal
node/ip-192-168-39-158.ec2.internal cordoned

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$ kubectl cordon ip-192-168-5-218.ec2.internal
node/ip-192-168-5-218.ec2.internal cordoned

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$ kubectl cordon ip-192-168-53-225.ec2.internal
node/ip-192-168-53-225.ec2.internal cordoned

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$ kubectl get nodes -L color
NAME                           STATUS                     ROLES    AGE     VERSION               COLOR
ip-192-168-21-84.ec2.internal  Ready                      <none>   6m50s   v1.30.14-eks-70ce843  green
ip-192-168-29-251.ec2.internal Ready                      <none>   6m50s   v1.30.14-eks-70ce843  green
ip-192-168-38-23.ec2.internal  Ready                      <none>   6m52s   v1.30.14-eks-70ce843  green
ip-192-168-39-158.ec2.internal Ready,SchedulingDisabled   <none>   4h21m   v1.29.15-eks-70ce843  blue
ip-192-168-5-218.ec2.internal  Ready,SchedulingDisabled   <none>   4h21m   v1.29.15-eks-70ce843  blue
ip-192-168-53-225.ec2.internal Ready,SchedulingDisabled   <none>   4h21m   v1.29.15-eks-70ce843  blue

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$
```

✅ Now new pods will automatically schedule on **GREEN** nodes.

Still the application is running



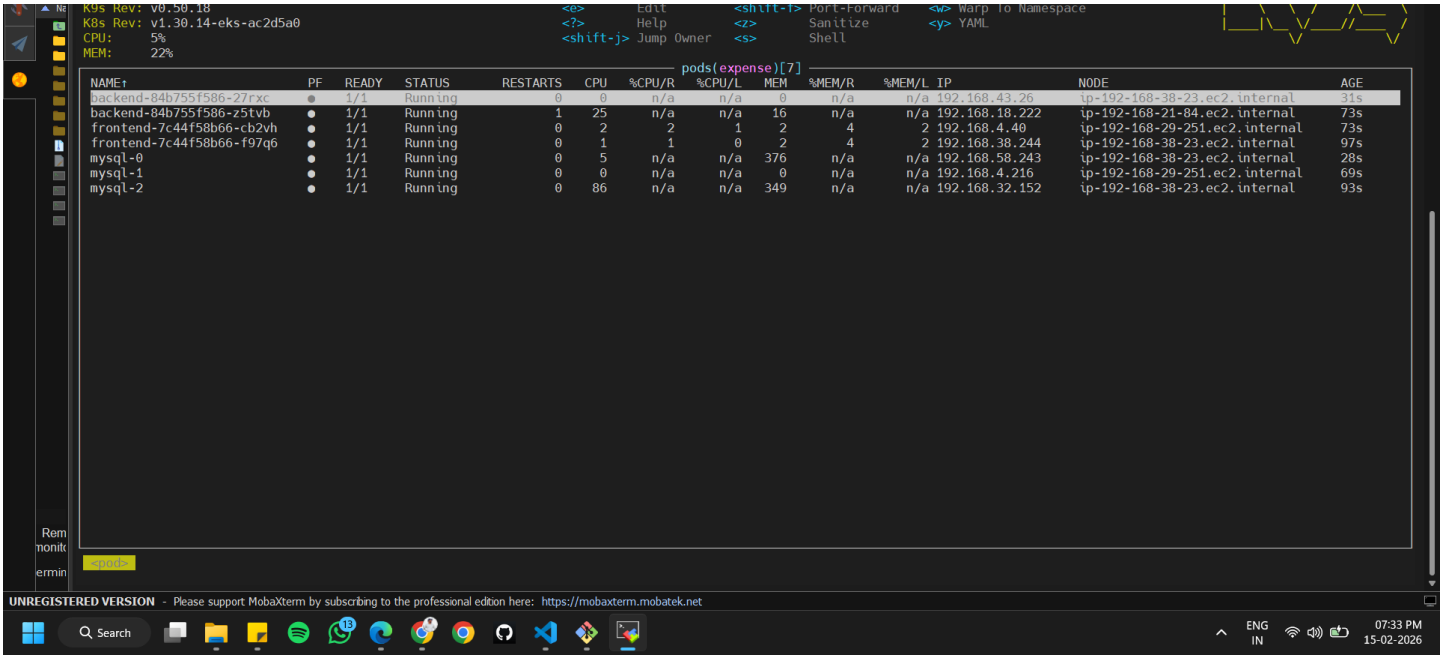
5 Drain BLUE Nodes (Move Pods to GREEN)

Drain nodes one-by-one:

```
kubectl drain <blue-node1> --ignore-daemonsets --delete-emptydir-data
kubectl drain <blue-node2> --ignore-daemonsets --delete-emptydir-data
kubectl drain <blue-node3> --ignore-daemonsets --delete-emptydir-data
```

👉 Drain evicts pods and Kubernetes recreates them on green nodes.

Blue nodes are drained and automatically all the pods are shifted to green nodes, Check age of the the pods.



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6 Validate Everything Running on GREEN

```
kubectl get pods -A -o wide
kubectl get nodes -L eksctl.io/nodegroup
```

Check the Ip addresses' all the pods are running in green nodes

```
34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$ kubectl get nodes -L color
NAME                          STATUS                     ROLES    AGE     VERSION               COLOR
ip-192-168-21-84.ec2.internal   Ready                      <none>   12m     v1.30.14-eks-70ce843  green
ip-192-168-29-251.ec2.internal  Ready                      <none>   12m     v1.30.14-eks-70ce843  green
ip-192-168-38-23.ec2.internal   Ready                      <none>   12m     v1.30.14-eks-70ce843  green
ip-192-168-39-158.ec2.internal  Ready,SchedulingDisabled   <none>   4h27m   v1.29.15-eks-70ce843  blue
ip-192-168-5-218.ec2.internal   Ready,SchedulingDisabled   <none>   4h27m   v1.29.15-eks-70ce843  blue
ip-192-168-53-225.ec2.internal  Ready,SchedulingDisabled   <none>   4h27m   v1.29.15-eks-70ce843  blue

34.230.38.116 | 172.31.90.11 | m7i-flex.large | null
[ ec2-user@ip-172-31-90-11 ~/files ]$ kubectl get pods -A -o wide
NAMESPACE     NAME                                READY   STATUS    RESTARTS      AGE     IP              NODE                             NOMINATED NODE   READINESS
 GATES
expense       backend-84b755f586-27rxc            1/1     Running   1 (66s ago)   118s    192.168.43.26   ip-192-168-38-23.ec2.internal    <none>           <none>
expense       backend-84b755f586-z5tvb            1/1     Running   1 (116s ago)  2m40s   192.168.18.222  ip-192-168-21-84.ec2.internal    <none>           <none>
expense       frontend-7c44f58b66-cb2vh           1/1     Running   0             2m40s   192.168.4.40    ip-192-168-29-251.ec2.internal   <none>           <none>
expense       frontend-7c44f58b66-f97q6           1/1     Running   0             3m4s    192.168.38.244  ip-192-168-38-23.ec2.internal    <none>           <none>
expense       mysql-0                             1/1     Running   0             115s    192.168.58.243  ip-192-168-38-23.ec2.internal    <none>           <none>
expense       mysql-1                             1/1     Running   0             2m36s   192.168.4.216   ip-192-168-29-251.ec2.internal   <none>           <none>
expense       mysql-2                             1/1     Running   0             3m      192.168.32.152  ip-192-168-38-23.ec2.internal    <none>           <none>
```

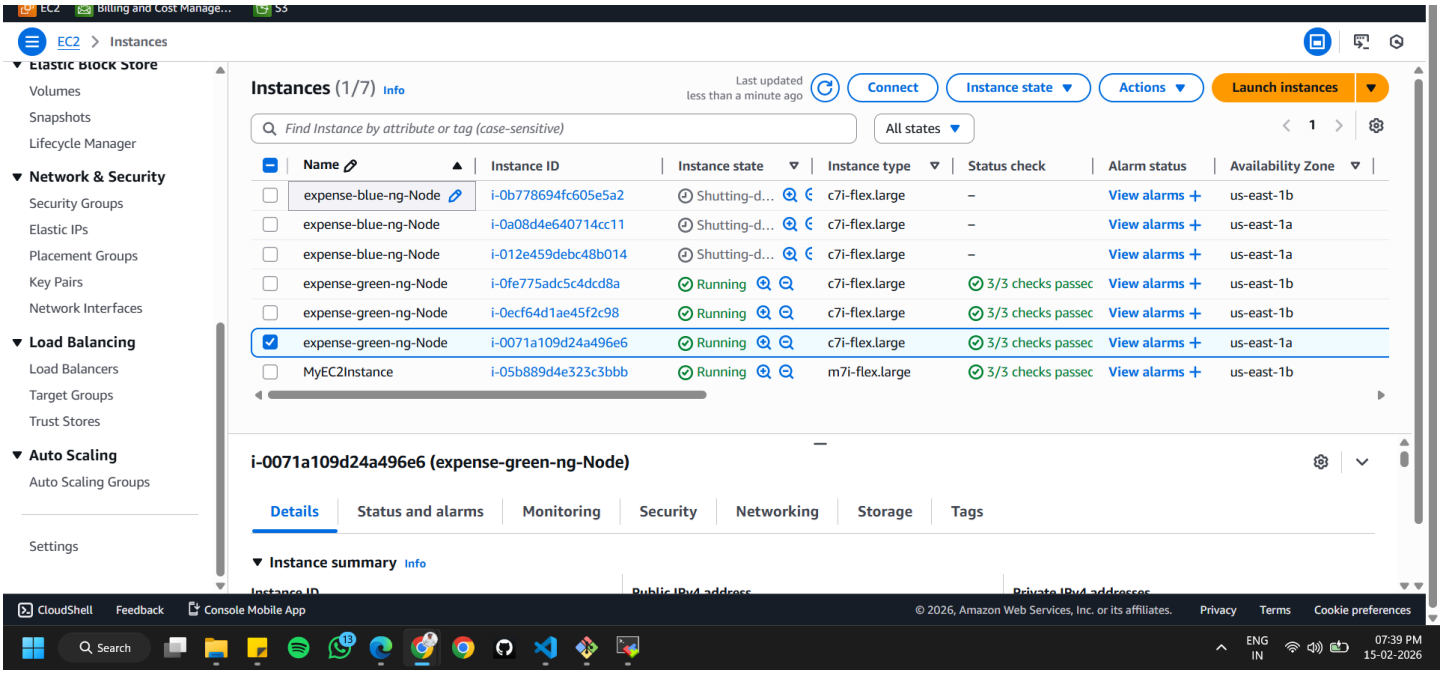
After checking all the objects are running perfectly, we can delete blue nodes.

7️⃣ Delete BLUE NodeGroup

After confirmation:

```
eksctl delete nodegroup \
  --cluster expense \
  --name blue-ng \
  --region us-east-1
```

✅ Now only green nodes remain.



⭐ Why This Approach is Best (Production Standard)

✅ No Deployment changes
✅ No Helm chart updates
✅ Smooth rolling migration
✅ Clean upgrade strategy
✅ Supports zero downtime (if replicas + PDB exist)

PDB (Most Common)

If your deployment has 3 replicas

You can allow only 1 pod disruption at a time.

```
apiVersion: policy/v1
kind: PodDisruptionBudget
metadata:
  name: expense-app-pdb
spec:
  minAvailable: 2
  selector:
    matchLabels:
      app: expense
```

Meaning:

- Total pods = 3
- At least **2 pods must always be running**
- Only **1 pod can be evicted at a time**