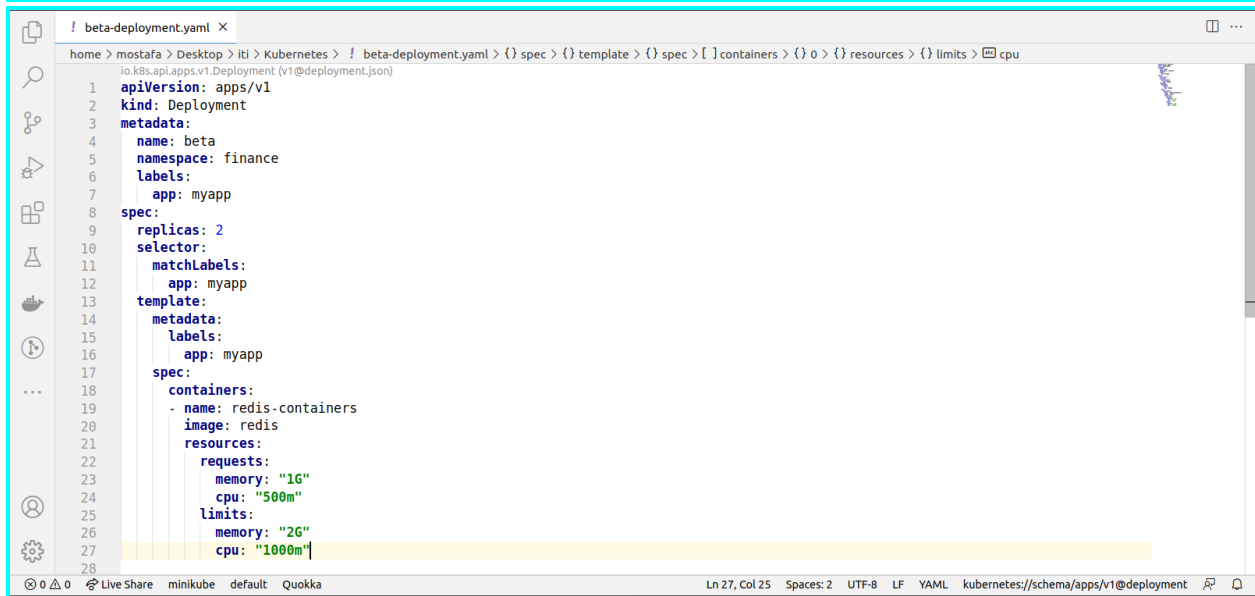


Q1,2

```
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$ kubectl get ns
NAME                STATUS    AGE
default             Active    2d7h
kube-node-lease     Active    2d7h
kube-public         Active    2d7h
kube-system         Active    2d7h
kubernetes-dashboard Active    2d7h
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$ kubectl get po --namespace kube-system
NAME                                READY   STATUS    RESTARTS   AGE
coredns-787d4945fb-r8g4j           1/1     Running   5 (5h36m ago)    2d7h
etcd-minikube                      1/1     Running   5 (4m53s ago)    2d7h
kube-apiserver-minikube            1/1     Running   4 (4m53s ago)    2d7h
kube-controller-manager-minikube   1/1     Running   5 (4m53s ago)    2d7h
kube-proxy-fbthc                   1/1     Running   4 (4m53s ago)    2d7h
kube-scheduler-minikube            1/1     Running   6 (4m53s ago)    2d7h
storage-provisioner                1/1     Running   8 (3m31s ago)    2d7h
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$
```

Q3

```
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$ kubectl create namespace finance
namespace/finance created
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$ kubectl apply -f beta-deployment.yaml
deployment.apps/beta created
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$
```



Q4

```
/control-plane=,node.kubernetes.io/exclude-from-external-load-balancers=
```

```
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$ kubectl get nodes
NAME        STATUS    ROLES    AGE   VERSION
minikube    Ready     control-plane  2d8h   v1.26.3
```

```
mostafa@mostafa-Predator:~/Desktop/iti/Kubernetes$ kubectl get nodes --show-labels | grep color
minikube    Ready     control-plane  2d8h   v1.26.3   beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,color=blue,kubernetes.io/hostname=minikube,kubernetes.io/os=linux,minikube.k8s.io/commit=08896fd1dc362c097c925146c4a0d0dac715ace0,minikube.k8s.io/primary=true,minikube.k8s.io/updated-at=2023_04_07T15_48_14_0700,minikube.k8s.io/version=v1.30.1,node-role.kubernetes.io/control-plane=,node.kubernetes.io/exclude-from-external-load-balancers=
```

```

mostafa@mostafa-Predator: ~/Desktop/iti/kubernetes$ k get nodes
NAME        STATUS    ROLES    AGE   VERSION
minikube    Ready     control-plane  19h   v1.26.3
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ k get nodes --show-labels | grep color
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ k get nodes --show-labels
NAME        STATUS    ROLES    AGE   VERSION   LABELS
minikube    Ready     control-plane  19h   v1.26.3   beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,kubernetes.io/arch=amd64,kubernetes.io/hostname=minikube,kubernetes.io/os=linux,minikube.k8s.io/commit=08896fd1dc362c097c925146c4a0d0dac715ace0,minikube.k8s.io/name=minikube,minikube.k8s.io/primary=true,minikube.k8s.io/updated_at=2023_07_01T20_24_37_0700,minikube.k8s.io/version=v1.30.1,node-role.kubernetes.io/control-plane=node.kubernetes.io/exclude-from-external-load-balancers=
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ k label nodes minikube color=blue
node/minikube labeled
mostafa@mostafa-Predator: ~/Desktop/iti/kubernetes$ k get nodes --show-labels | grep color
minikube    Ready     control-plane  19h   v1.26.3   beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,color=blue,kubernetes.io/arch=amd64,kubernetes.io/hostname=minikube,kubernetes.io/os=linux,minikube.k8s.io/commit=08896fd1dc362c097c925146c4a0d0dac715ace0,minikube.k8s.io/name=minikube,minikube.k8s.io/primary=true,minikube.k8s.io/updated_at=2023_07_01T20_24_37_0700,minikube.k8s.io/version=v1.30.1,node-role.kubernetes.io/control-plane=node.kubernetes.io/exclude-from-external-load-balancers=
mostafa@mostafa-Predator: ~/Desktop/iti/kubernetes$

```

Q5

blue-deployment.yaml

```

1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: blue
5  spec:
6    replicas: 3
7    selector:
8      matchLabels:
9        app: myapp
10   template:
11     metadata:
12       labels:
13         app: myapp
14     spec:
15       affinity:
16         nodeAffinity:
17           requiredDuringSchedulingIgnoredDuringExecution:
18             nodeSelectorTerms:
19               - matchExpressions:
20                 - key: color
21                   operator: In
22                   values:
23                     - blue
24     containers:
25       - name: nginx-containers
26         image: nginx
27

```

```

mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl apply -f blue-deployment.yaml
deployment.apps/blue unchanged
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl get deployment
NAME        READY   UP-TO-DATE   AVAILABLE   AGE
deployment-1  3/3     1             3           7h51m
deployment-1  0/3     3             0           7h57m
deployment-13 0/3     3             0           7h56m
nginx-deployment 1/1     1             1           9h

```

Q6

```
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl create ns iti
namespace/iti created
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ code quota-pod.yaml
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl apply -f quota-pod.yaml --namespace=iti
resourcequota/pod-rsrc-quota created
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl get resourcequota pod-rsrc-quota --namespace=iti --output=yaml
apiVersion: v1
kind: ResourceQuota
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"v1","kind":"ResourceQuota","metadata":{"annotations":{},"name":"pod-rsrc-quota","namespace":"iti"},"spec":{"hard":{"pods":"2"}}}
  creationTimestamp: "2023-04-09T22:43:17Z"
  name: pod-rsrc-quota
  namespace: iti
  resourceVersion: "28889"
  uid: 6d7d16a8-81ee-4326-bbe2-1f7ffdfc88ef
spec:
  hard:
    pods: "2"
status:
  hard:
    pods: "2"
  used:
    pods: "0"
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$
```

Q7

```
ngnix-dep.yaml - Visual Studio Code
File Edit Selection View Go Run Terminal Help
! beta-deployment.yaml ! blue-deployment.yaml ! ngnix-dep.yaml X ...
> Desktop > iti > Kubernetes > ! ngnix-dep.yaml > {} spec > {} selector > {} matchLabels > app
io.k8s.api.apps.v1.Deployment (v1@deployment.json)
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: nginx
5    namespace: iti
6
7  spec:
8
9    replicas: 3
10   selector:
11     matchLabels:
12       app: myapp
13   template:
14     metadata:
15       labels:
16         app: myapp
17     spec:
18       containers:
19         - name: nginx-containers
20           image: nginx
21           resources:
22             requests:
23               memory: "16"
24               cpu: "500m"
25             limits:
26               memory: "26"
27               cpu: "1000m"
28
29
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl apply -f ngnix-dep.yaml
deployment.apps/nginx configured
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl get deployment nginx --namespace=iti --output=yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  annotations:
    deployment.kubernetes.io/revision: "2"
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"apps/v1","kind":"Deployment","metadata":{"annotations":{"deployment.kubernetes.io/revision":"2"},"name":"nginx","namespace":"iti"},"spec":{"replicas":3,"selector":{"matchLabels":{"app":"myapp"},"template":{"metadata":{"labels":{"app":"myapp"}}},"spec":{"containers":[{"image":"nginx","name":"nginx-containers","resources":{"limits":{"cpu":"1000m","memory":"26"},"requests":{"cpu":"500m","memory":"16"}}}}]}}}
  creationTimestamp: "2023-04-09T23:01:54Z"
  generation: 3
  name: nginx
  namespace: iti
  resourceVersion: "31028"
  uid: 12f7de8b-5fb3-48b7-872f-652f9a71a6a4
spec:
  progressDeadlineSeconds: 600
  replicas: 3
  revisionHistoryLimit: 10
  selector:
    matchLabels:
      app: myapp
  strategy:
    rollingUpdate:
      maxSurge: 25%
      maxUnavailable: 25%
    type: RollingUpdate
```

Q8

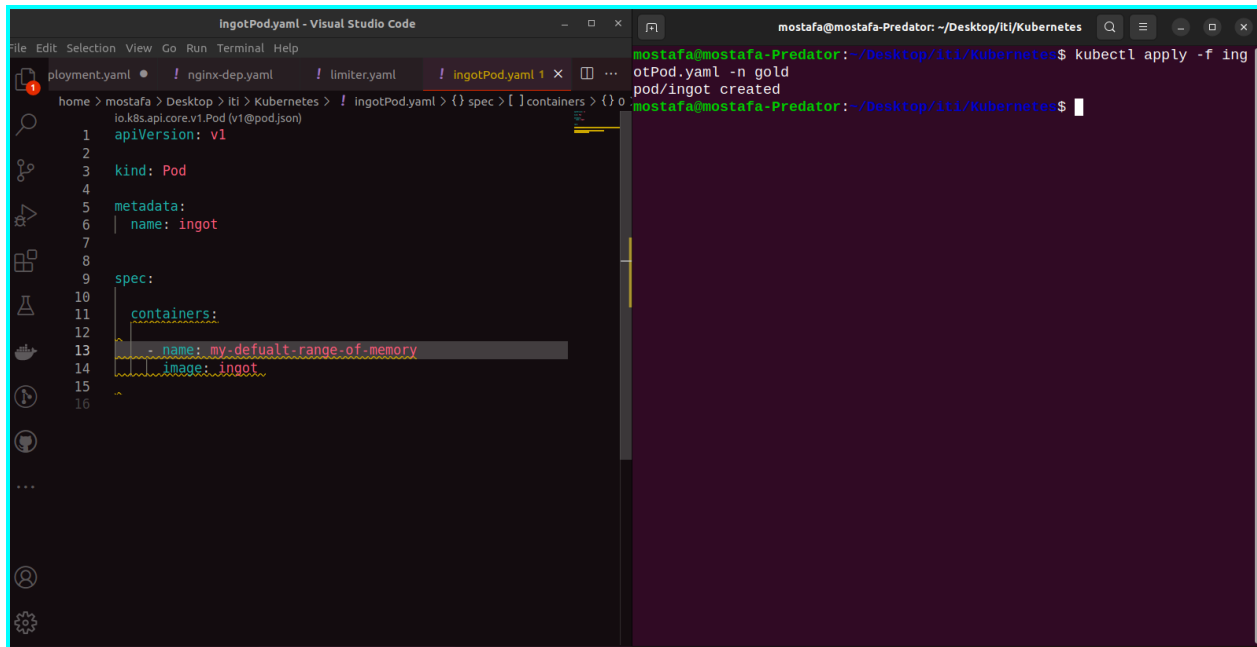
```
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl get deployment -o yaml
metadata:
  creationTimestamp: null
  labels:
    app: myapp
  spec:
    containers:
    - image: nginx
      imagePullPolicy: Always
      name: nginx-containers
      resources:
        limits:
          cpu: "1"
          memory: 2G
        requests:
          cpu: 500m
          memory: 1G
      terminationMessagePath: /dev/termination-log
      terminationMessagePolicy: File
    dnsPolicy: ClusterFirst
    restartPolicy: Always
    schedulerName: default-scheduler
    securityContext: {}
    terminationGracePeriodSeconds: 30
status:
  availableReplicas: 2
  conditions:
  - lastTransitionTime: "2023-04-09T23:01:55Z"
    lastUpdateTime: "2023-04-09T23:01:55Z"
    message: Deployment does not have minimum availability.
    reason: MinimumReplicasUnavailable
    status: "False"
    type: Available
  - lastTransitionTime: "2023-04-09T23:01:55Z"
    lastUpdateTime: "2023-04-09T23:01:55Z"
    message: "pods 'nginx-958c95b49-866hc' is forbidden: exceeded quota: pod-rsrc-quota, requested: pods=1, used: pods=2, limited: pods=2"
    reason: FailedCreate
    status: "True"
    type: ReplicaFailure
  - lastTransitionTime: "2023-04-09T23:14:27Z"
    lastUpdateTime: "2023-04-09T23:14:27Z"
    message: Created new replica set "nginx-bcbcf87c6"
    reason: NewReplicaSetCreated
    status: "True"
    type: Progressing
  observedGeneration: 3
  readyReplicas: 2
  replicas: 2
  unavailableReplicas: 2
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$
```

Q9

```
limiter.yaml - Visual Studio Code
File Edit Selection View Go Run Terminal Help
1 limiter.yaml 2 blue-deployment.yaml 3 nginx-dep.yaml 4 limiter.yaml x ...
1 apiVersion: v1
2
3 kind: LimitRange
4
5 metadata:
6   name: memory-limit-range
7
8 spec:
9   limits:
10    - default:
11      memory: 512Mi
12
13    defaultRequest:
14      memory: 256Mi
15
16 type: Container
17
18
19
20
21
22

mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl create namespace gold
namespace/gold created
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ code limiter.yaml
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$ kubectl apply -f limiter.yaml --namespace=iti
limitrange/memory-limit-range created
mostafa@mostafa-Predator: ~/Desktop/iti/Kubernetes$
```

Q10



The image shows a Visual Studio Code editor window on the left and a terminal window on the right. The VS Code window displays a file named `ingotPod.yaml` with the following content:

```
1 apiVersion: v1
2
3 kind: Pod
4
5 metadata:
6   name: ingot
7
8
9 spec:
10   containers:
11     - name: my.default.range.of.memory
12       image: ingot
13
14
15
16
```

The terminal window shows the command `kubectl apply -f ingotPod.yaml -n gold` being executed, resulting in the output `pod/ingot created`.

Q11

QOS: Burstable, limit & request of gold namespace are not equal.