

CLOUD COMPUTING LAB RECORD

TEAM MEMBERS:

GOKUL RAM K (1934008)

NANDA KISHORE V (1934023)

SURYA R E (1934051)

Dockerfile

```
Dockerfile X
024pricing-plans > dist > Dockerfile > FROM
1 FROM nginx:alpine
2 COPY . /usr/share/nginx/html
```

Building Docker image:

```
D:\sem\5\DCC\project\024pricing-plans\dist>docker build -t pricing:v1 .
[+] Building 4.6s (7/7) FINISHED
=> [internal] load build definition from Dockerfile 0.4s
=> => transferring dockerfile: 84B 0.0s
=> [internal] load .dockerignore 0.4s
=> => transferring context: 2B 0.0s
=> [internal] load metadata for docker.io/library/nginx:alpine 3.9s
=> [internal] load build context 0.3s
=> => transferring context: 4.16kB 0.0s
=> CACHED [1/2] FROM docker.io/library/nginx:alpine@sha256:da9c94bec1da829ebd52431a84502ec471c8e548ffb2cedbf3626 0.0s
=> [2/2] COPY . /usr/share/nginx/html 0.0s
=> exporting to image 0.0s
=> => exporting layers 0.0s
=> => writing image sha256:88d3f398cd6630065eea8d44d2db7711934eee54fc5267272c2f61214668be3c 0.0s
=> => naming to docker.io/library/pricing:v1 0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
```

Running image:

```
D:\sem\5\DCC\project\024pricing-plans\dist>docker run -d -p 80:80 pricing:v1
30ba5c82f2ea35475b0ed64ae816f65b567541ccdf9844ee9db66781d0558c57
```

Image caching:

pricing	IN USE	v1	88d3f398cd66	4 minutes ago	23.44 MB	 RUN ▶
---------	--------	----	--------------	---------------	----------	---

Layer caching:

<

pricing:v1

IN USE

IMAGE ID

88d3f398cd66

CREATED

4 minutes ago

SIZE

23.44 MB

More actions

▼


RUN

IMAGE HISTORY


COMMAND


0	COPY . /usr/share/nginx/html # buildkit	4.04 KB
1	/bin/sh -c #(nop) CMD ["nginx" "-g" "daemon ...	0 Bytes
2	/bin/sh -c #(nop) STOPSIGNAL SIGQUIT	0 Bytes
3	/bin/sh -c #(nop) EXPOSE 80	0 Bytes
4	/bin/sh -c #(nop) ENTRYPOINT ["/docker-entr...	0 Bytes
5	/bin/sh -c #(nop) COPY file:09a214a3e07c919...	4.61 KB
6	/bin/sh -c #(nop) COPY file:0fd5fca330dcd6a7...	1.04 KB
7	/bin/sh -c #(nop) COPY file:0b866ff3fc1ef5b03...	1.96 KB
8	/bin/sh -c #(nop) COPY file:65504f71f5855ca0...	1.2 KB
9	/bin/sh -c set -x && addgroup -g 101 -S nginx ...	17.84 MB


Cointainer:


 peaceful_elbakyan pricing:v1


RUNNING PORT: 80











Container Service exposure:

localhost/index.html

Pick the best plan for you

FREE

\$0/mo

1 Project

5 Team Members

50 Personal Projects

5,000 Messages

GET STARTED

PREMIUM

\$39/mo

5 Project

20 Team Members

100 Personal Projects

15,000 Messages

GET STARTED

PLATINUM

\$89/mo

25 Project

50 Team Members

500 Personal Projects

50,000 Messages

GET STARTED

Created with ❤️ by Subash - Read about how I created it in this article
Other projects on Github

Docker logs:

```
C:\Windows\System32\cmd.exe
D:\sem\5\DCC\project\024pricing-plans\dist>docker logs peaceful_elbakyan
/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
2022/01/28 14:55:00 [notice] 1#1: using the "epoll" event method
2022/01/28 14:55:00 [notice] 1#1: nginx/1.21.6
2022/01/28 14:55:00 [notice] 1#1: built by gcc 10.3.1 20211027 (Alpine 10.3.1_git20211027)
2022/01/28 14:55:00 [notice] 1#1: OS: Linux 5.10.16.3-microsoft-standard-WSL2
2022/01/28 14:55:00 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/01/28 14:55:00 [notice] 1#1: start worker processes
2022/01/28 14:55:00 [notice] 1#1: start worker process 33
2022/01/28 14:55:00 [notice] 1#1: start worker process 34
2022/01/28 14:55:00 [notice] 1#1: start worker process 35
2022/01/28 14:55:00 [notice] 1#1: start worker process 36
2022/01/28 14:55:00 [notice] 1#1: start worker process 37
2022/01/28 14:55:00 [notice] 1#1: start worker process 38
2022/01/28 14:55:00 [notice] 1#1: start worker process 39
2022/01/28 14:55:00 [notice] 1#1: start worker process 40
172.17.0.1 - - [28/Jan/2022:14:59:23 +0000] "GET /index.html HTTP/1.1" 200 2035 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/97.0.4692.99 Safari/537.36" "-"
172.17.0.1 - - [28/Jan/2022:14:59:23 +0000] "GET /style.css HTTP/1.1" 200 1960 "http://localhost/index.html" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/97.0.4692.99 Safari/537.36" "-"
```

Executing into the container:

```
D:\sem\5\DCC\project\024pricing-plans\dist>docker exec -it peaceful_elbakyan sh
/ # ls
bin                etc                mnt                run                tmp
dev                home               opt                sbin               usr
docker-entrypoint.d lib                proc               srv                var
docker-entrypoint.sh media              root               sys
/ #
```

Kubernetes:

Starting minikube:

```
D:\sem\5\DCC\project\024pricing-plans\dist>minikube start
* minikube v1.25.1 on Microsoft Windows 10 Home Single Language 10.0.19043 Build 19043
* 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 v1.23.1 on Docker 20.10.12 ...
  - kubelet.housekeeping-interval=5m
* Verifying Kubernetes components...
! Executing "docker container inspect minikube --format={{.State.Status}}" took an unusually long time: 2.856650s
* Restarting the docker service may improve performance.
  - 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

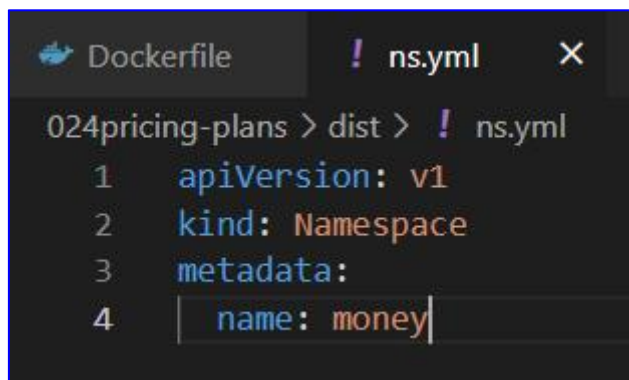
D:\sem\5\DCC\project\024pricing-plans\dist>docker run -d -p 80:80 pricing:v1
4fc2ff259c4be5af93ac5b504829a14ac78652b6aea19c94286002be6c176552
docker: Error response from daemon: driver failed programming external connectivity on endpoint happy_newton (9b...
already allocated
```

Creating name space:

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get namespaces
NAME                STATUS    AGE
default             Active    82m
kube-node-lease     Active    82m
kube-public         Active    82m
kube-system         Active    82m

D:\sem\5\DCC\project\024pricing-plans\dist>kubectl apply -f ns.yml
namespace/money created

D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get namespaces
NAME                STATUS    AGE
default             Active    89m
kube-node-lease     Active    89m
kube-public         Active    89m
kube-system         Active    89m
money               Active    52s
```



The screenshot shows a code editor with two tabs: 'Dockerfile' and 'ns.yml'. The 'ns.yml' tab is active and shows the following content:

```
024pricing-plans > dist > ! ns.yml
1  apiVersion: v1
2  kind: Namespace
3  metadata:
4    name: money
```

Creating pod:

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl apply -f deployment.yaml
deployment.apps/money-deployment created
```



```
! deployment.yaml X
024pricing-plans > dist > ! deployment.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    labels:
5      app: money
6    name: money-deployment
7    namespace: money
8  spec:
9    replicas: 1
10   selector:
11     matchLabels:
12       app: money
13   template:
14     metadata:
15       labels:
16         app: money
17     spec:
18       containers:
19         - image: pricing:v1
20           imagePullPolicy: Never
21           name: money
22           ports:
23             - containerPort: 80
```

Pod deployment:

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get deployments -n money
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
money-deployment    1/1     1            1           2m7s

D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get pods -n money
NAME                                READY   STATUS    RESTARTS   AGE
money-deployment-69b74568c5-rvwkf  1/1     Running   0          3m32s

D:\sem\5\DCC\project\024pricing-plans\dist>
```

Configuring deploying pod with 2 replicas:

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl apply -f deployment.yaml
deployment.apps/money-deployment configured
```

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get pods -n money
NAME                                READY   STATUS             RESTARTS   AGE
money-deployment-69b74568c5-pb8m6   0/1     ContainerCreating   0           18s
money-deployment-69b74568c5-rvwkf   1/1     Running             0           6m35s
```

Service Exposure:

```
! deployment.yaml ! service.yaml X
024pricing-plans > dist > ! service.yaml
1  apiVersion: v1
2  kind: Service
3  metadata:
4    name: money-service
5    namespace: money
6  spec:
7    selector:
8      app: money
9    type: LoadBalancer
10   ports:
11     - protocol: TCP
12       port: 8080
13       targetPort: 80
14       nodePort: 30000
```

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get service
NAME      TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes ClusterIP  10.96.0.1     <none>        443/TCP    110m

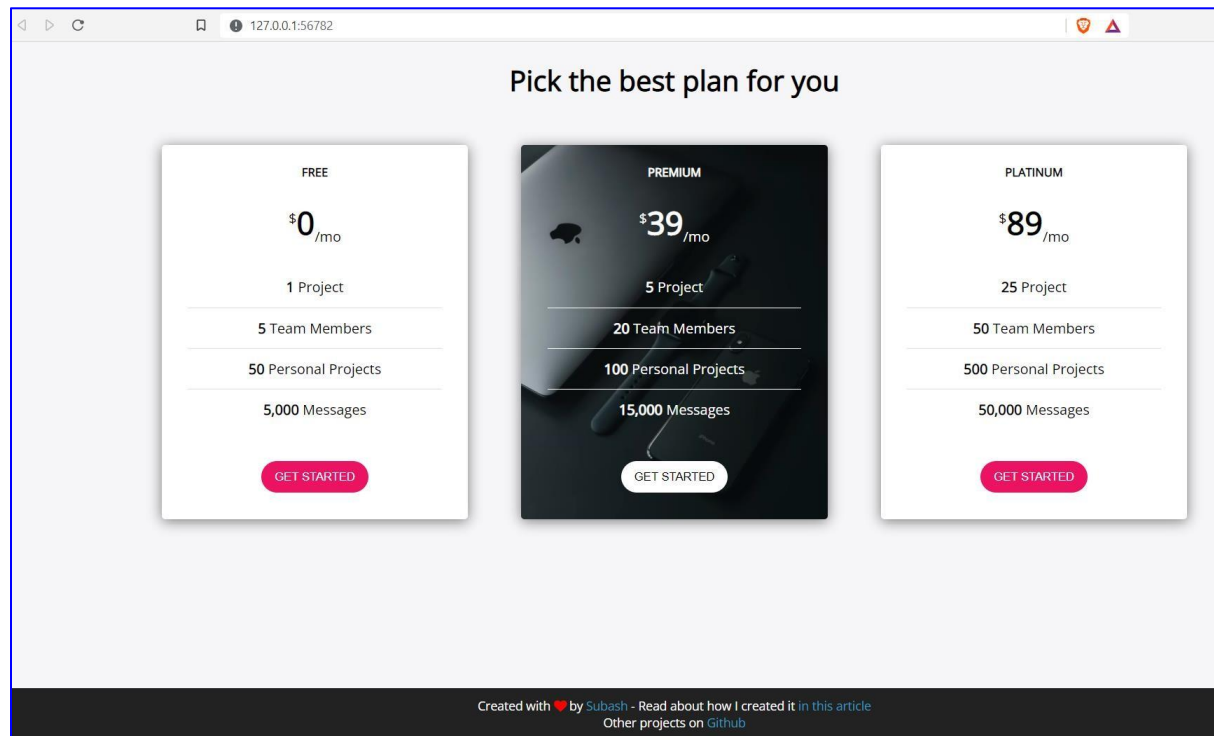
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get service -n money
No resources found in money namespace.

D:\sem\5\DCC\project\024pricing-plans\dist>kubectl apply -f service.yaml
service/money-service created

D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get service -n money
NAME          TYPE          CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
money-service LoadBalancer  10.103.100.75 <pending>     8080:30000/TCP   6s

D:\sem\5\DCC\project\024pricing-plans\dist>minikube service money-service -n money
! Executing "docker container inspect minikube --format={{.State.Status}}" took an unusually long time.
4.6279659s
* Restarting the docker service may improve performance.
-----
| NAMESPACE | NAME          | TARGET PORT | URL                  |
|-----|
| money     | money-service | 8080        | http://192.168.49.2:30000 |
|-----|
* Starting tunnel for service money-service.
-----
| NAMESPACE | NAME          | TARGET PORT | URL                  |
|-----|
| money     | money-service |             | http://127.0.0.1:56782 |
|-----|
* Opening service money/money-service in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```

Hosted Webpage:



Resource limitation:

```
C:\Windows\System32\cmd.exe
D:\sem\S\DDC\project\024pricing-plans\dist\kubectl apply -f deployment.yaml
deployment.apps/money-deployment configured

D:\sem\S\DDC\project\024pricing-plans\dist\kubectl get deployments -n money
NAME READY UP-TO-DATE AVAILABLE AGE
money-deployment 2/2 1 2 40m

D:\sem\S\DDC\project\024pricing-plans\dist\kubectl get pods -n money
NAME READY STATUS RESTARTS AGE
money-deployment-6649c8bb7-v6q85 0/1 CreateContainerError 0 3m57s
money-deployment-69b74568c5-pb8mp 1/1 Running 0 36m
money-deployment-69b74568c5-rvwkf 1/1 Running 0 42m

D:\sem\S\DDC\project\024pricing-plans\dist\kubectl describe pod money-deployment-6649c8bb7-v6q85
Error from server (NotFound): pods "money-deployment-6649c8bb7-v6q85" not found

D:\sem\S\DDC\project\024pricing-plans\dist\kubectl describe pod money-deployment-6649c8bb7-v6q85
Error from server (NotFound): pods "money-deployment-6649c8bb7-v6q85" not found

D:\sem\S\DDC\project\024pricing-plans\dist\kubectl describe pod money-deployment-6649c8bb7-v6q85 -n money
Name: money-deployment-6649c8bb7-v6q85
Namespace: money
Priority: 0
Node: minikube/192.168.49.2
Start Time: Fri, 28 Jan 2022 21:41:24 +0530
Labels: app=money
pod-template-hash=6649c8bb7
Annotations: <none>
Status: Pending
IP: <none>
IPs: <none>
Controlled By: ReplicaSet/money-deployment-6649c8bb7
Containers:
  money:
    Container ID:
    Image: pricing:v1
    Image ID:
    Port: 80/TCP
    Host Port: 0/TCP
    State: Waiting
    Reason: CreateContainerError
    Ready: False
    Restart Count: 0
    Limits:
      cpu: 100m
      memory: 1Mi
    Requests:
      cpu: 100m
      memory: 1Mi
    Environment: <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-b5qbg (ro)
```

```
C:\Windows\System32\cmd.exe
Conditions:
  Type      Status
  Initialized True
  Ready      False
  ContainersReady False
  PodScheduled True
Volumes:
  kube-api-access-b5q9q:
    Type:      Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName: kube-root-ca.crt
    ConfigMapOptional: <nil>
    DownwardAPI: true
QoS Class:      Guaranteed
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    8m22s    default-scheduler    Successfully assigned money/money-deployment-6649c8bb7-v6q85 to minikube
  Normal    Pulled       7m55s    kubelet    Container image "pricing:v1" already present on machine
  Warning   Failed       7m55s    kubelet    Error: Error response from daemon: Minimum memory limit allowed is 6MB
  Warning   FailedCreatePodSandbox 5m4s    kubelet    Failed to create pod sandbox: rpc error: code = Unknown desc = failed to start sandbox container for pod "money-deployment-6649c8bb7-v6q85": operation timeout: context deadline exceeded
  Warning   FailedSync   2m0s (x6 over 3m2s) kubelet    error determining status: rpc error: code = DeadlineExceeded desc = context deadline exceeded
  Normal    SandboxChanged 94s (x2 over 7m4s) kubelet    Pod sandbox changed, it will be killed and re-created.

D:\sen\S\OCC\project\024pricing-plans\dist>
```


ROLLBACK STRATEGY

Version-2

```
D:\sem\5\DCC\project\024pricing-plans\dist>docker build -t pricing:v2 .
[+] Building 8.6s (7/7) FINISHED
=> [internal] load build definition from Dockerfile                                0.5s
=> => transferring dockerfile: 31B                                              0.0s
=> [internal] load .dockerignore                                                0.5s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/nginx:alpine                5.5s
=> [internal] load build context                                              0.3s
=> => transferring context: 3.07kB                                             0.0s
=> CACHED [1/2] FROM docker.io/library/nginx:alpine@sha256:da9c94bec1da829ebd52431a84502ec471c8e 0.0s
=> [2/2] COPY . /usr/share/nginx/html                                          0.7s
=> exporting to image                                                         1.2s
=> => exporting layers                                                         1.1s
=> => writing image sha256:727246815d5c585dad9801550ae268700fc1417d1bc8b3dccb5af5741ab66ac5 0.0s
=> => naming to docker.io/library/pricing:v2                                   0.0s
```

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl apply -f deployment.yaml
deployment.apps/money-deployment configured
```

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl get deployments -n money
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
money-deployment    2/2     1            2           60m
```

```
D:\sem\5\DCC\project\024pricing-plans\dist>minikube service money-service -n money
! Executing "docker container inspect minikube --format={{.State.Status}}" took an unusually long time: 3.7580478s
* Restarting the docker service may improve performance.
```

NAMESPACE	NAME	TARGET PORT	URL
money	money-service	8080	http://192.168.49.2:30000

```
* Starting tunnel for service money-service.
```

NAMESPACE	NAME	TARGET PORT	URL
money	money-service		http://127.0.0.1:56862

```
* Opening service money/money-service in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
* Stopping tunnel for service money-service.
```

Pick the best plan for you

FREE

\$0/mo

1 Project

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GET STARTED

GET STARTED

PLATINUM

\$89/mo

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GET STARTED

Rolling back to version 1:

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl rollout history deploy money-deployment -n money
deployment.apps/money-deployment
REVISION    CHANGE-CAUSE
1           <none>
2           <none>
3           <none>
```

```
D:\sem\5\DCC\project\024pricing-plans\dist>kubectl rollout undo deploy money-deployment --to-revision=1 -n money
deployment.apps/money-deployment rolled back
```

```
D:\sem\5\DCC\project\024pricing-plans\dist>minikube service money-service -n money
! Executing "docker container inspect minikube --format={{.State.Status}}" took an unusually long time: 3.9564709s
* Restarting the docker service may improve performance.
```

NAMESPACE	NAME	TARGET PORT	URL
money	money-service	8080	http://192.168.49.2:30000

```
* Starting tunnel for service money-service.
```

NAMESPACE	NAME	TARGET PORT	URL
money	money-service		http://127.0.0.1:51738

```
* Opening service money/money-service in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```

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