

MIDSEM ASSIGNMENTS

Assignment_1(b)

Developing and Deploying a Node.js app from Docker to Kubernetes

From,

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To,

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1.Creating Node.js app

```
1 const express = require("express");
2 const app = express();app.listen(3000, function () {
3   console.log("listening on 3000");
4 });app.get("/", (req, res) => {
5   res.send("Users Shown");
6 });app.get("/delete", (req, res) => {
7   res.send("Delete User");
8 });app.get("/update", (req, res) => {
9   res.send("Update User");
10 });app.get("/insert", (req, res) => {
11   res.send("Insert User");
12 });
```

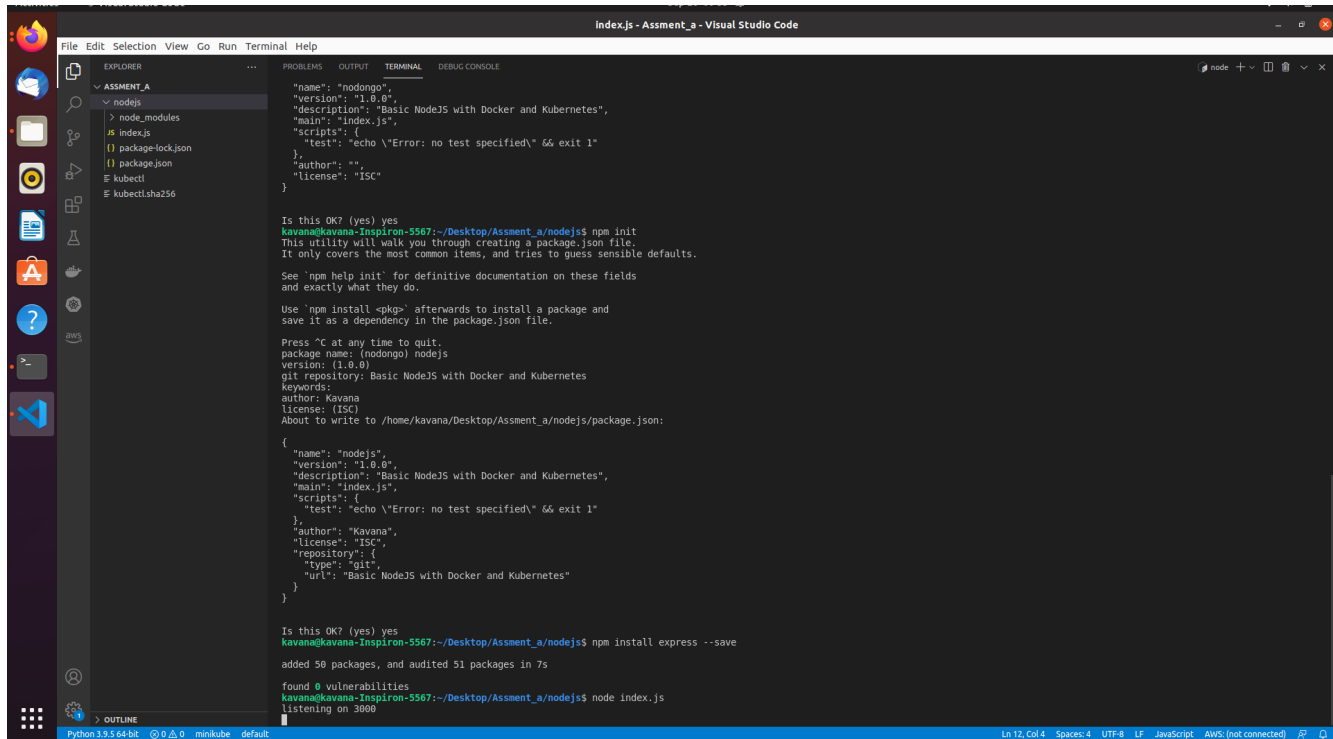
```
secret/memberlist created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube ip
192.168.49.2
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f configmap.yaml
configmap/config created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl delete svc nodejs-deployment
service "nodejs-deployment" deleted
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type=LoadBalancer
service/nodejs-deployment exposed
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes           ClusterIP           10.96.0.1        <none>            443/TCP          105m
nodejs-deployment    LoadBalancer       10.108.24.64     192.168.79.61    3000:32272/TCP   17s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

2.Package.json(containing project details and dependencies)

```
1 {
2   "name": "nodejs",
3   "version": "1.0.0",
4   "description": "Basic NodeJS with Docker and Kubernetes",
5   "main": "index.js",
6   "scripts": {
7     "test": "echo \"Error: no test specified\" && exit 1"
8   },
9   "author": "Kavana",
10  "license": "ISC",
11  "repository": {
12    "type": "git",
13    "url": "Basic NodeJS with Docker and Kubernetes"
14  },
15  "dependencies": {
16    "express": "^4.17.1"
17  }
18 }
19
```

```
secret/memberlist created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube ip
192.168.49.2
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f configmap.yaml
configmap/config created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl delete svc nodejs-deployment
service "nodejs-deployment" deleted
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type=LoadBalancer
service/nodejs-deployment exposed
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes           ClusterIP           10.96.0.1        <none>            443/TCP          105m
nodejs-deployment    LoadBalancer       10.108.24.64     192.168.79.61    3000:32272/TCP   17s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

3. Test Node.js app (on local host)



The screenshot shows the Visual Studio Code interface with the Explorer, Terminal, and Output panels. The Explorer panel on the left shows a project structure for 'Assment_a' with a 'nodejs' directory containing 'package-lock.json', 'package.json', 'kubect!', and 'kubect!.sha256'. The Terminal panel shows the execution of 'npm init' and 'npm install express --save' commands. The Output panel shows the resulting 'package.json' file and the installation progress.

```
File Edit Selection View Go Run Terminal Help
EXPLORER
Assment_a
├── nodejs
│   ├── package-lock.json
│   ├── package.json
│   ├── kubect!
│   └── kubect!.sha256
└── node_modules
    └── index.js

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
nodejs
"name": "nodongo",
"version": "1.0.0",
"description": "Basic NodeJS with Docker and Kubernetes",
"main": "index.js",
"scripts": {
  "test": "echo \\Error: no test specified\\ && exit 1"
},
"author": "",
"license": "ISC"
}

Is this OK? (yes) yes
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See 'npm help init' for definitive documentation on these fields
and exactly what they do.

Use 'npm install <pkg>' afterwards to install a package and
save it as a dependency in the package.json file.

Press ^C at any time to quit.
package name: (nodongo) nodejs
version: (1.0.0)
git repository: Basic NodeJS with Docker and Kubernetes
keywords:
author: Kavana
license: (ISC)
About to write to /home/kavana/Desktop/Assment_a/nodejs/package.json:

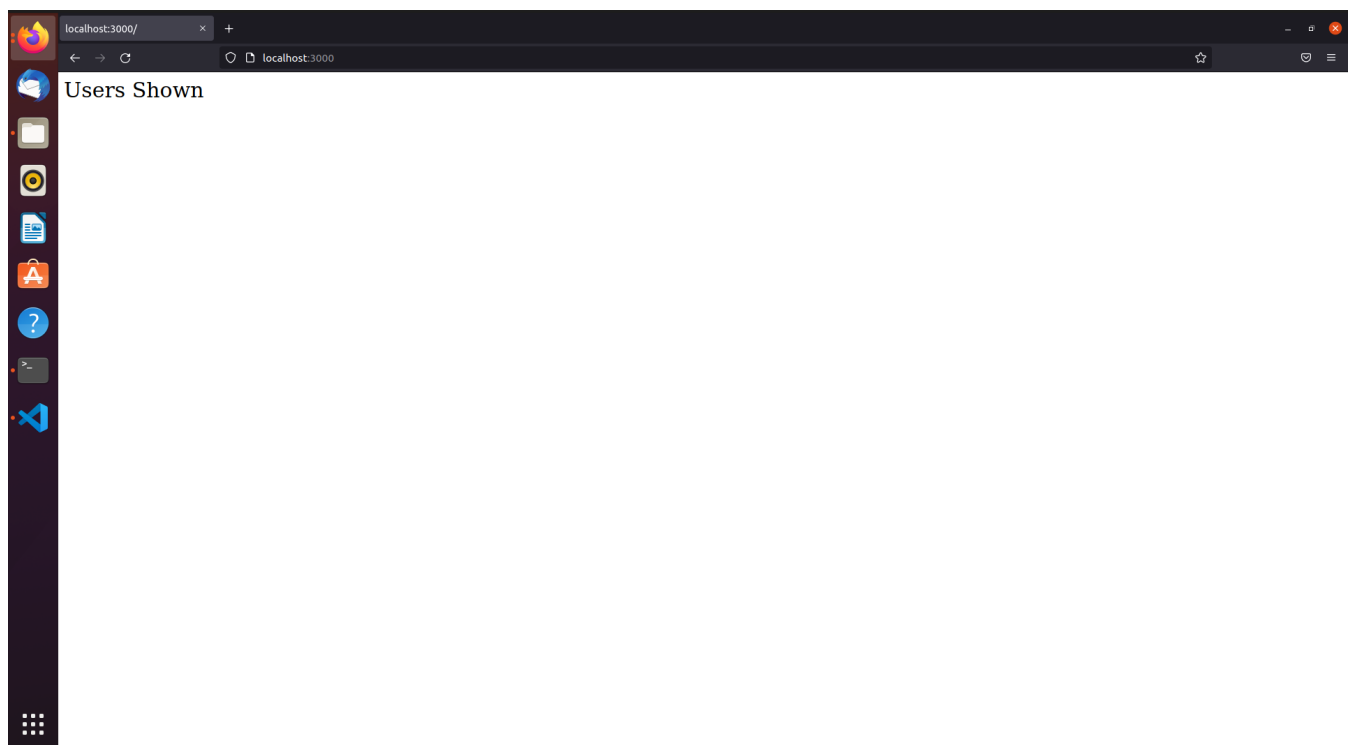
{
  "name": "nodejs",
  "version": "1.0.0",
  "description": "Basic NodeJS with Docker and Kubernetes",
  "main": "index.js",
  "scripts": {
    "test": "echo \\Error: no test specified\\ && exit 1"
  },
  "author": "Kavana",
  "license": "ISC",
  "repository": {
    "type": "git",
    "url": "Basic NodeJS with Docker and Kubernetes"
  }
}

Is this OK? (yes) yes
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ npm install express --save

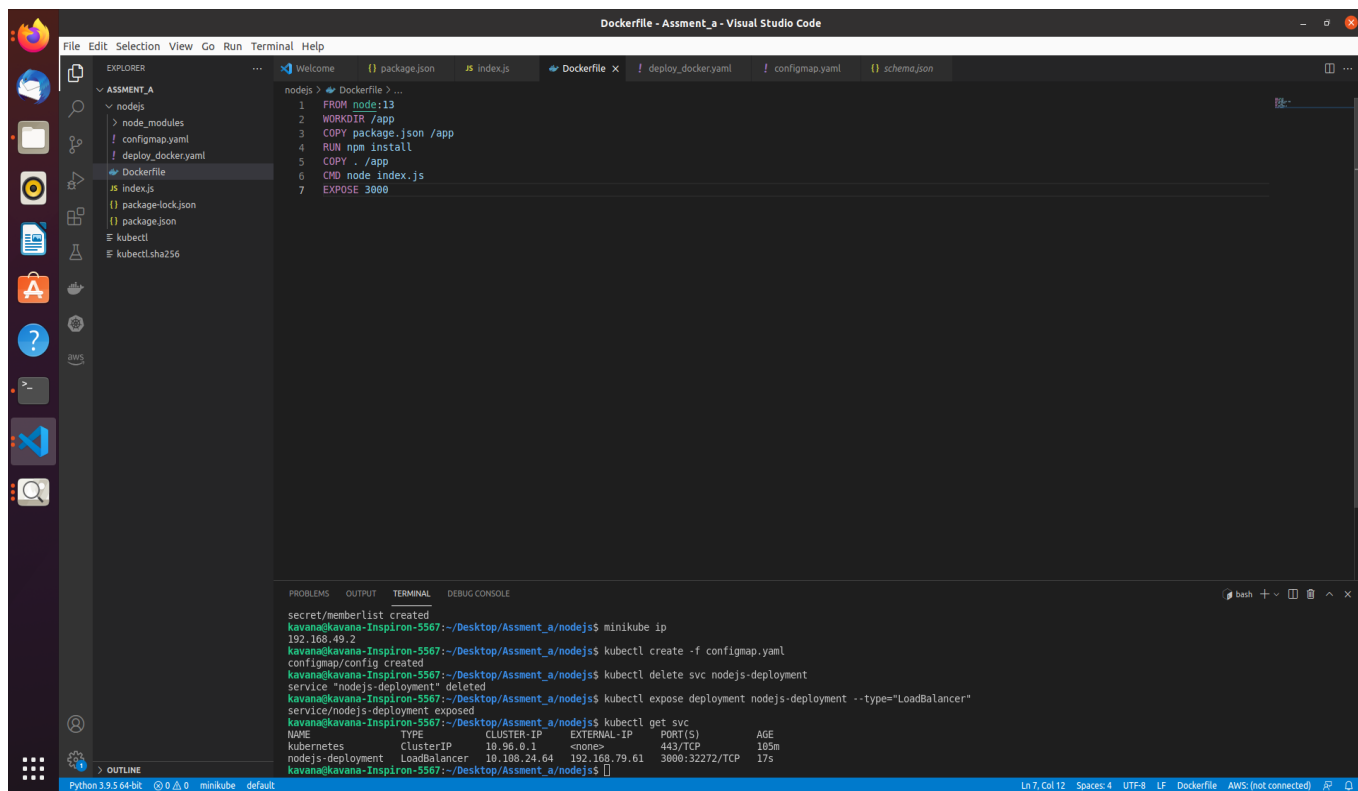
added 50 packages, and audited 51 packages in 7s

found 0 vulnerabilities
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ node index.js
listening on 3000
```

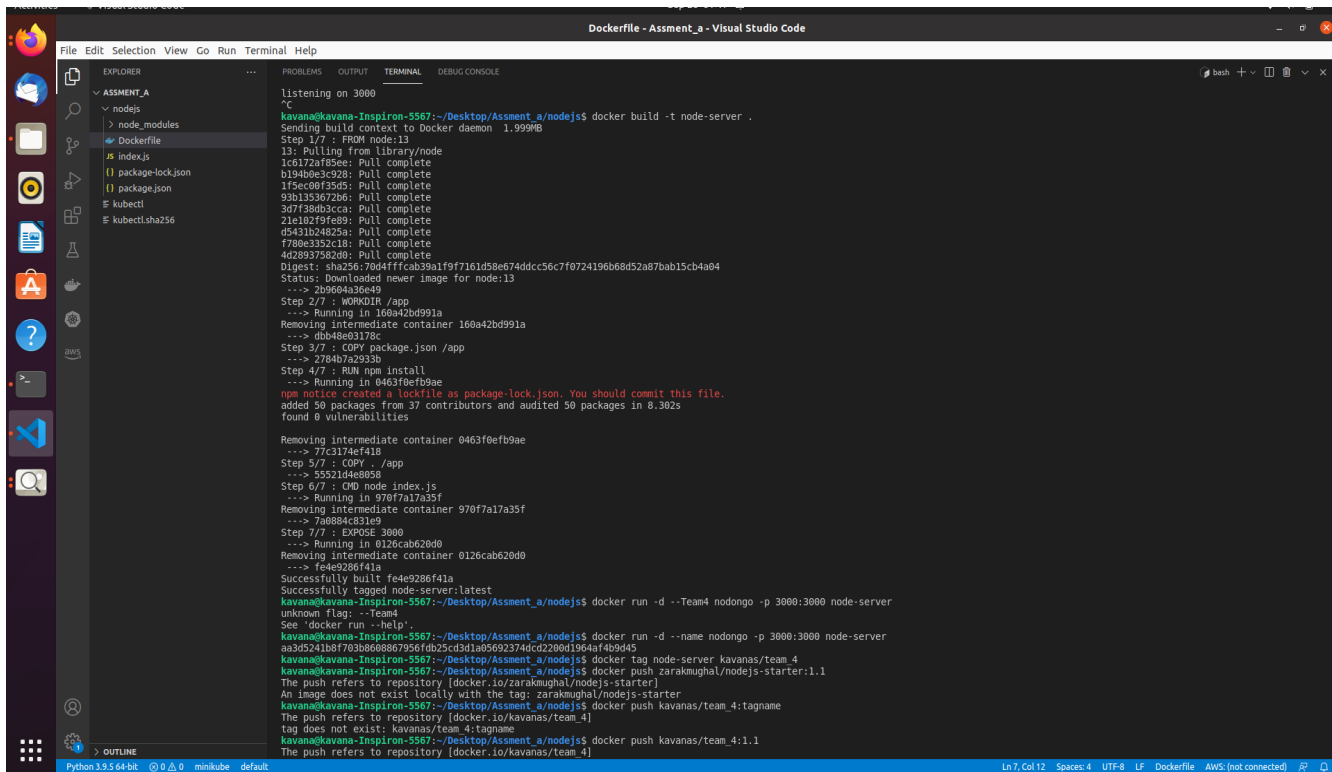
Python 3.9.5 64-bit 0.0.0 minikube default Ln 12, Col 4 Spaces: 4 UTF-8 LF JavaScript AWS (not connected) JS



4. Dockerising node server creating a dockerfile



5. Building our image dockerfile and ,Creating and running the container

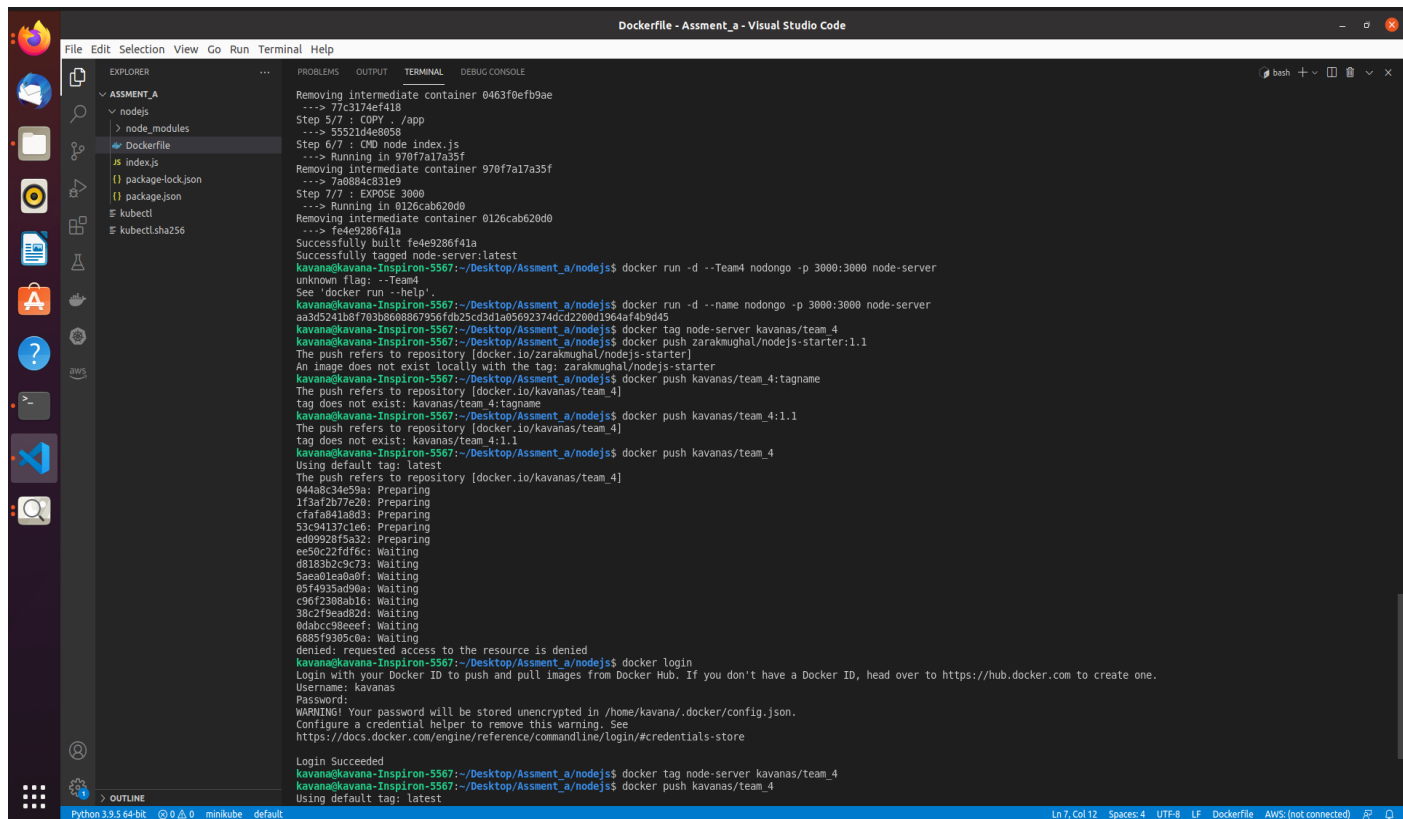
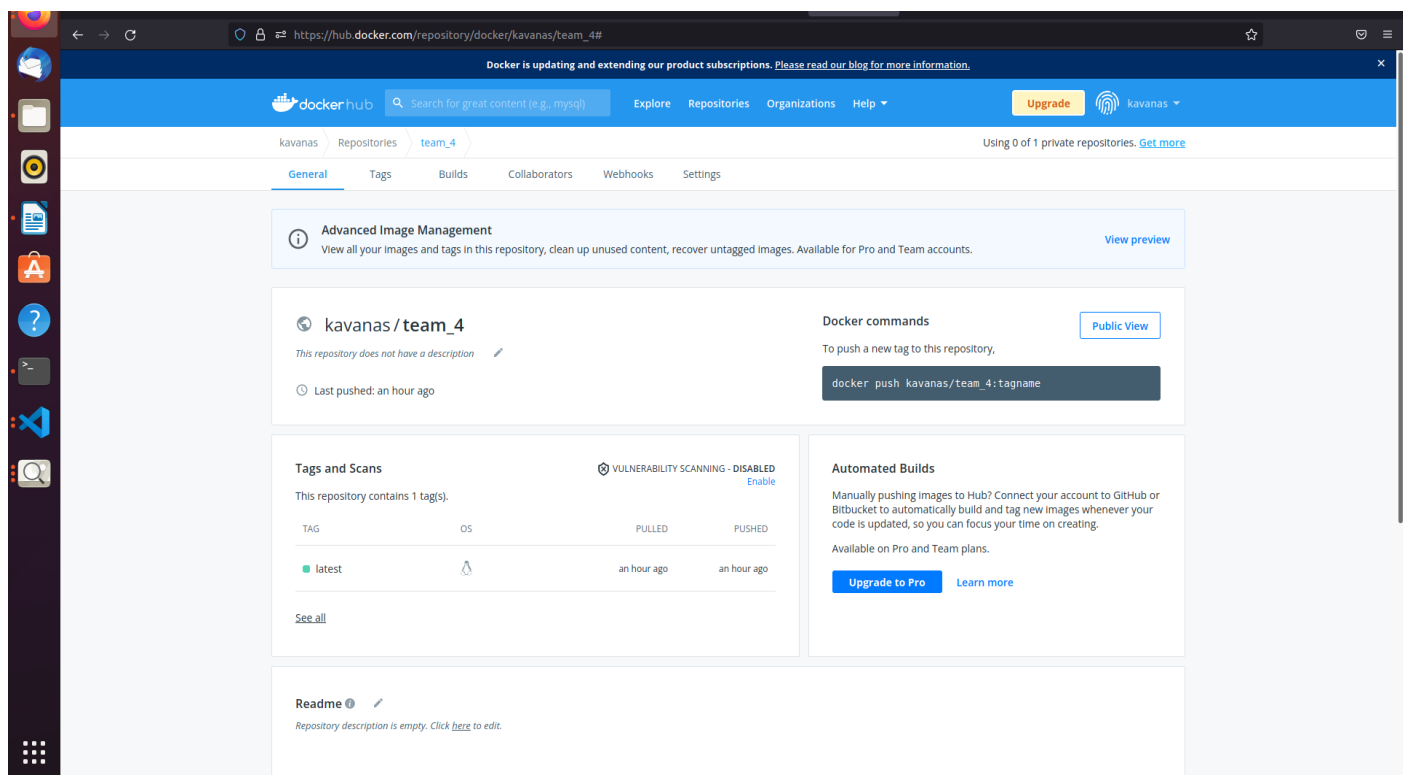


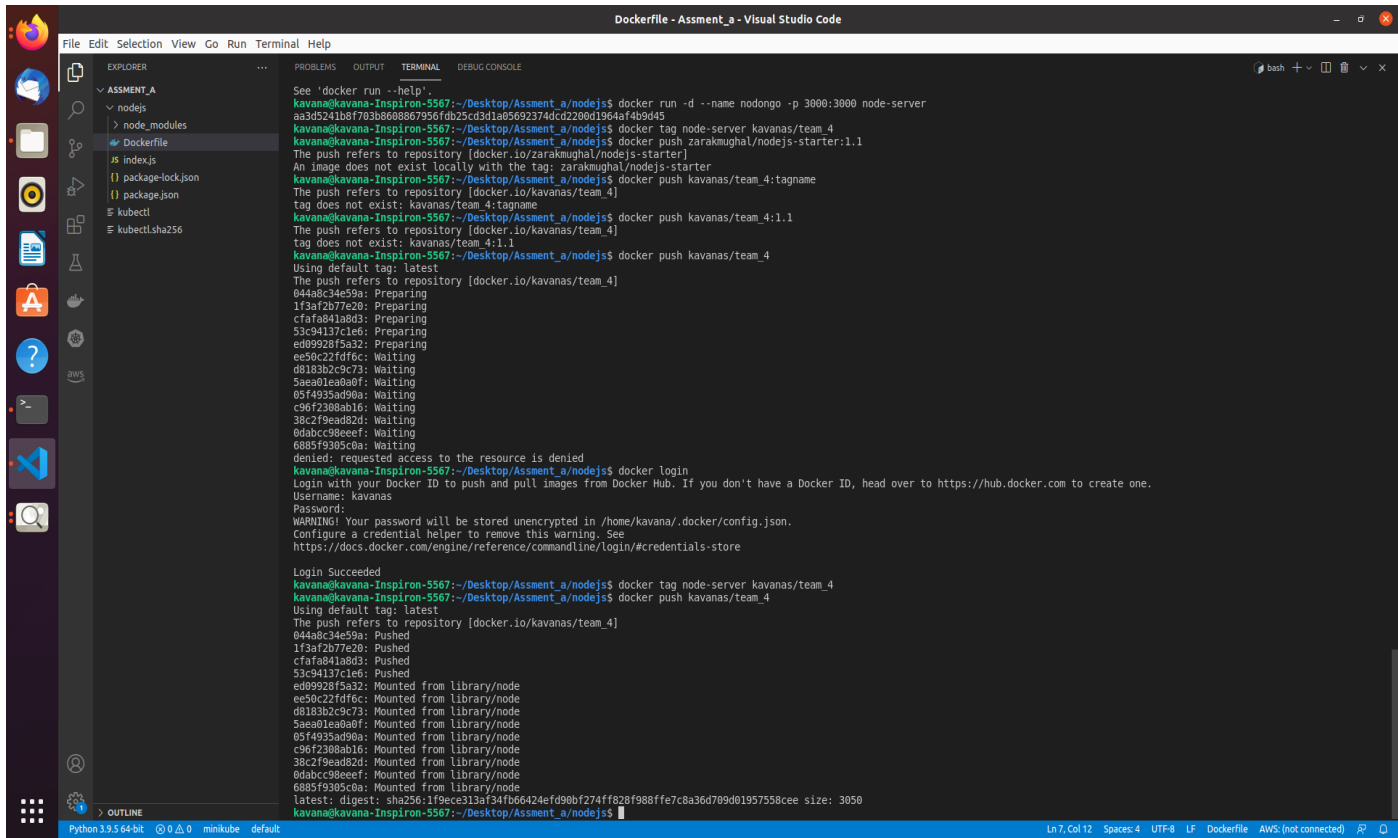
The screenshot shows the Visual Studio Code interface with the Dockerfile build process running in the terminal. The Explorer pane on the left shows the project structure for 'Assment_a', including 'node_modules', 'Dockerfile', 'index.js', 'package-lock.json', and 'package.json'. The terminal output shows the following steps:

```
Listening on 3000
^C
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker build -t node-server .
Sending build context to Docker daemon 1.999MB
Step 1/7: FROM node:13
13: Pulling from library/node
1c6172af85ee: Pull complete
b194b0e3c928: Pull complete
1f6ec0bf35d5: Pull complete
93b1353072b6: Pull complete
3d7f38d03cca: Pull complete
21a3102f9f8b: Pull complete
d5431b24825a: Pull complete
f780e3352c18: Pull complete
4d28937582d0: Pull complete
Digest: sha256:70d41ffcab39a1f9f7161d58e674ddcc56c7f0724196b68d52a87bab15cb4a04
Status: Downloaded newer image for node:13
--> 2b9664a36e49
Step 2/7: WORKDIR /app
--> Running in 160a42bd991a
Removing intermediate container 160a42bd991a
--> ddb48e0317bc
Step 3/7: COPY package.json /app
--> 2784b7a2933b
Step 4/7: RUN npm install
--> Running in 0463f0efb9ae
npm notice created a lockfile as package-lock.json. You should commit this file.
added 50 packages from 37 contributors and audited 50 packages in 8.302s
found 0 vulnerabilities

Removing intermediate container 0463f0efb9ae
--> 77c3174ef418
Step 5/7: COPY . /app
--> 55521d4e8858
Step 6/7: CMD node index.js
--> Running in 970f7a17a35f
Removing intermediate container 970f7a17a35f
--> 7d0894c831e9
Step 7/7: EXPOSE 3000
--> Running in 0126cab620d0
Removing intermediate container 0126cab620d0
--> fe4e9286f41a
Successfully built fe4e9286f41a
Successfully tagged node-server:latest
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker run -d --Team4 nodongo -p 3000:3000 node-server
unknown flag: --Team4
See 'docker run --help'.
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker run -d --name nodongo -p 3000:3000 node-server
aa3d5241b8f703b0808867956f0b25cd3d1a05692374dc0200d1964af4b9d45
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker tag node-server kavas/team.4
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push zarakmughal/nodejs-starter:1.1
The push refers to repository [docker.io/zarakmughal/nodejs-starter]
An image does not exist locally with the tag: zarakmughal/nodejs-starter
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavas/team.4:tagname
The push refers to repository [docker.io/kavas/team.4]
tag does not exist: kavas/team.4:tagname
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavas/team.4:1.1
The push refers to repository [docker.io/kavas/team.4]
```

6. Uploading The Image To Docker Registry Docker Hub





The screenshot shows the Visual Studio Code interface with a Dockerfile open in the editor. The Explorer sidebar on the left shows the project structure: `ASSMENT_A` containing `nodejs`, `node_modules`, `Dockerfile`, `index.js`, `package-lock.json`, `package.json`, `kubectl`, and `kubectl.sha256`. The terminal window shows the following commands and output:

```
See 'docker run --help'.
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker run -d --name nodongo -p 3000:3000 node-server
aa3d5241b8f703b8608867956fdb25cd3d1a85692374dcd2200d1964af4b9d45
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker tag node-server kavano/team_4
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push zarakmughal/nodejs-starter:1.1
The push refers to repository [docker.io/zarakmughal/nodejs-starter]
An image does not exist locally with the tag: zarakmughal/nodejs-starter
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavano/team_4:tagname
The push refers to repository [docker.io/kavano/team_4]
tag does not exist: kavano/team_4:tagname
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavano/team_4:1.1
The push refers to repository [docker.io/kavano/team_4]
tag does not exist: kavano/team_4:1.1
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavano/team_4
Using default tag: latest
The push refers to repository [docker.io/kavano/team_4]
044a8c34e59a: Preparing
1f3af2b77e20: Preparing
cfafa841a8d3: Preparing
53c94137c1e6: Preparing
ed09928f5a32: Preparing
ee58c22fd6fc: Waiting
d0183b2c9c73: Waiting
5aea01ea0a0f: Waiting
05f4935ad90a: Waiting
c96f2308ab16: Waiting
38c2f9ead82d: Waiting
0dadcc98eeef: Waiting
6885f9305c0a: Waiting
denied: requested access to the resource is denied
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: kavano
Password:
WARNING! Your password will be stored unencrypted in /home/kavana/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker tag node-server kavano/team_4
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavano/team_4
Using default tag: latest
The push refers to repository [docker.io/kavano/team_4]
044a8c34e59a: Pushed
1f3af2b77e20: Pushed
cfafa841a8d3: Pushed
53c94137c1e6: Pushed
ed09928f5a32: Mounted from library/node
ee58c22fd6fc: Mounted from library/node
d0183b2c9c73: Mounted from library/node
5aea01ea0a0f: Mounted from library/node
05f4935ad90a: Mounted from library/node
c96f2308ab16: Mounted from library/node
38c2f9ead82d: Mounted from library/node
0dadcc98eeef: Mounted from library/node
6885f9305c0a: Mounted from library/node
latest: digest: sha256:1f9ece313af34fb06424efd90bf27aff828f980ffe7c8a36d709d01957558cee size: 3050
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

7.Starting The Kubernetes Cluster

The screenshot shows a Visual Studio Code editor with a terminal window open. The terminal displays the following commands and output:

```
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker tag node-server kavas/team_4
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ docker push kavas/team_4
Using default tag: latest
The push refers to repository [docker.io/kavas/team_4]
044a8c34e59a: Pushed
1f3af2b77c0b: Pushed
cfafa841a8d3: Pushed
53c94137c1e6: Pushed
ed09928f5a32: Mounted from library/node
ee50c22df6c: Mounted from library/node
d8183b2c9c73: Mounted from library/node
5aea01ea0a0f: Mounted from library/node
05f4935ad90a: Mounted from library/node
c96f2308a016: Mounted from library/node
38c2f9ead82d: Mounted from library/node
0dabcc98eeef: Mounted from library/node
6885f9305c0a: Mounted from library/node
latest: digest: sha256:1f9ece313af4fb66424ef00bf274ff82f988ffe7c8a36d709d01957558cee size: 3050
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube start
minikube v1.23.2 on Ubuntu 21.04
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 v1.22.2 on Docker 20.10.8 ...
Verifying Kubernetes components...
  * Using image gcr.io/k8s-minikube/storage-provisioner:v5
  * Enabled addons: storage-provisioner, default-storageclass
Done! kubectll is now configured to use "minikube" cluster and "default" namespace by default
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f deploy.yaml
error: the path "deploy.yaml" does not exist
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f deploy_docker.yaml
deployment.apps/nodejs-deployment created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/nodejs-deployment    0/2      2              0            38s

NAME                                READY    STATUS      RESTARTS    AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1      ContainerCreating    0            29s
pod/nodejs-deployment-d86b8557b-zbx94 0/1      ContainerCreating    0            29s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/nodejs-deployment    0/2      2              0            73s

NAME                                READY    STATUS      RESTARTS    AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1      ContainerCreating    0            72s
pod/nodejs-deployment-d86b8557b-zbx94 0/1      ContainerCreating    0            72s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/nodejs-deployment    0/2      2              0            2m17s

NAME                                READY    STATUS      RESTARTS    AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1      ContainerCreating    0            2m16s
pod/nodejs-deployment-d86b8557b-zbx94 0/1      ContainerCreating    0            2m16s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type=LoadBalancer
service/nodejs-deployment exposed
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME                                TYPE                                CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
```

8. Writing yaml file to deploy into kubernete cluster

The screenshot shows a Visual Studio Code window with a terminal running a series of Kubernetes commands. The Explorer sidebar on the left shows a project named 'ASSMENT_A' with files like 'node_modules', 'configmap.yaml', 'deployment.yaml', 'Dockerfile', 'index.js', 'package-lock.json', 'package.json', 'kubect', and 'kubect.sha256'. The terminal output shows the following commands and their results:

```
NAME READY STATUS RESTARTS AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1 ContainerCreating 0 29s
pod/nodejs-deployment-d86b8557b-zbx94 0/1 ContainerCreating 0 29s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME READY UP-TO-DATE AVAILABLE AGE
deployment.apps/nodejs-deployment 0/2 2 0 73s

NAME READY STATUS RESTARTS AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1 ContainerCreating 0 72s
pod/nodejs-deployment-d86b8557b-zbx94 0/1 ContainerCreating 0 72s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME READY UP-TO-DATE AVAILABLE AGE
deployment.apps/nodejs-deployment 0/2 2 0 2m17s

NAME READY STATUS RESTARTS AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1 ContainerCreating 0 2m16s
pod/nodejs-deployment-d86b8557b-zbx94 0/1 ContainerCreating 0 2m16s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type=LoadBalancer
service/nodejs-deployment exposed
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 100m
nodejs-deployment LoadBalancer 10.103.20.16 <pending> 3000:30330/TCP 32s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl apply -f https://raw.githubusercontent.com/google/metalb/v0.9.3/manifests/namespace.yaml
namespace/metalb-system created
Warning: policy/v1beta1 PodSecurityPolicy is deprecated in v1.21+, unavailable in v1.25+
podsecuritypolicy.policy/controller created
podsecuritypolicy.policy/speaker created
serviceaccount/controller created
serviceaccount/speaker created
clusterrole.rbac.authorization.k8s.io/metalb-system:controller created
clusterrole.rbac.authorization.k8s.io/metalb-system:speaker created
role.rbac.authorization.k8s.io/config-watcher created
role.rbac.authorization.k8s.io/pod-listener created
clusterrolebinding.rbac.authorization.k8s.io/metalb-system:controller created
clusterrolebinding.rbac.authorization.k8s.io/metalb-system:speaker created
rolebinding.rbac.authorization.k8s.io/config-watcher created
rolebinding.rbac.authorization.k8s.io/pod-listener created
Warning: spec.template.spec.nodeSelector[beta.kubernetes.io/os]: deprecated since v1.14; use "kubernetes.io/os" instead
daemonset.apps/speaker created
deployment.apps/controller created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create secret generic -n metalb-system memberlist --from-literal=secretkey="$(openssl rand -base64 128)"
secret/memberlist created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube ip
192.168.49.2
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f configmap.yaml
configmap/config created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl delete svc nodejs-deployment
service "nodejs-deployment" deleted
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type=LoadBalancer
service/nodejs-deployment exposed
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 105m
nodejs-deployment LoadBalancer 10.108.24.64 192.168.79.61 3000:32272/TCP 17s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

10.Commands to get external IP address

This screenshot is a continuation of the previous one, showing the same terminal session. The output for the 'kubectl get svc' command is highlighted, showing the external IP address for the 'nodejs-deployment' service:

```
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 100m
nodejs-deployment LoadBalancer 10.103.20.16 <pending> 3000:30330/TCP 32s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl apply -f https://raw.githubusercontent.com/google/metalb/v0.9.3/manifests/namespace.yaml
namespace/metalb-system created
Warning: policy/v1beta1 PodSecurityPolicy is deprecated in v1.21+, unavailable in v1.25+
podsecuritypolicy.policy/controller created
podsecuritypolicy.policy/speaker created
serviceaccount/controller created
serviceaccount/speaker created
clusterrole.rbac.authorization.k8s.io/metalb-system:controller created
clusterrole.rbac.authorization.k8s.io/metalb-system:speaker created
role.rbac.authorization.k8s.io/config-watcher created
role.rbac.authorization.k8s.io/pod-listener created
clusterrolebinding.rbac.authorization.k8s.io/metalb-system:controller created
clusterrolebinding.rbac.authorization.k8s.io/metalb-system:speaker created
rolebinding.rbac.authorization.k8s.io/config-watcher created
rolebinding.rbac.authorization.k8s.io/pod-listener created
Warning: spec.template.spec.nodeSelector[beta.kubernetes.io/os]: deprecated since v1.14; use "kubernetes.io/os" instead
daemonset.apps/speaker created
deployment.apps/controller created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create secret generic -n metalb-system memberlist --from-literal=secretkey="$(openssl rand -base64 128)"
secret/memberlist created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube ip
192.168.49.2
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f configmap.yaml
configmap/config created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl delete svc nodejs-deployment
service "nodejs-deployment" deleted
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type=LoadBalancer
service/nodejs-deployment exposed
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 105m
nodejs-deployment LoadBalancer 10.108.24.64 192.168.79.61 3000:32272/TCP 17s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

11.Creating a config map file for the address pool

The screenshot shows the Visual Studio Code editor with the file `configmap.yaml` open. The file content is as follows:

```
1 apiVersion: v1
2 kind: ConfigMap
3 metadata:
4   namespace: metallb-system
5   name: config
6 data:
7   config: |
8     address-pools:
9     - name: default
10       protocol: layer2
11       addresses:
12       - 192.168.79.61-192.168.79.71
```

The terminal output shows the following commands and results:

```
secret/memberlist created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube ip
192.168.49.2
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f configmap.yaml
configmap/config created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl delete svc nodejs-deployment
service "nodejs-deployment" deleted
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type="LoadBalancer"
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes           ClusterIP           10.96.0.1        <none>            443/TCP          105m
nodejs-deployment    LoadBalancer       10.108.24.64     192.168.79.61    3000:32272/TCP   17s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

12.Verifying External IP

The screenshot shows the Visual Studio Code editor with the terminal output. The output shows the following commands and results:

```
NAME                READY   STATUS    RESTARTS   AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1     ContainerCreating    0          29s
pod/nodejs-deployment-d86b8557b-zbx94 0/1     ContainerCreating    0          29s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/nodejs-deployment 0/2     2             0           73s

NAME                READY   STATUS    RESTARTS   AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1     ContainerCreating    0          72s
pod/nodejs-deployment-d86b8557b-zbx94 0/1     ContainerCreating    0          72s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get deploy,po
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/nodejs-deployment 0/2     2             0           2m17s

NAME                READY   STATUS    RESTARTS   AGE
pod/nodejs-deployment-d86b8557b-s7x7m 0/1     ContainerCreating    0          2m16s
pod/nodejs-deployment-d86b8557b-zbx94 0/1     ContainerCreating    0          2m16s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type="LoadBalancer"
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes           ClusterIP           10.96.0.1        <none>            443/TCP          100m
nodejs-deployment    LoadBalancer       10.103.20.16     <pending>         3000:30330/TCP   32s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl apply -f https://raw.githubusercontent.com/google/metallb/v0.9.3/manifests/namespace.yaml
namespace/metallb-system created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl apply -f https://raw.githubusercontent.com/google/metallb/v0.9.3/manifests/metallb.yaml
Warning: policy/v1beta1 PodSecurityPolicy is deprecated in v1.21+, unavailable in v1.25+
podsecuritypolicy.policy/controller created
podsecuritypolicy.policy/speaker created
serviceaccount/controller created
serviceaccount/speaker created
clusterrole.rbac.authorization.k8s.io/metallb-system:controller created
clusterrole.rbac.authorization.k8s.io/metallb-system:speaker created
role.rbac.authorization.k8s.io/config-watcher created
clusterrolebinding.rbac.authorization.k8s.io/metallb-system:controller created
clusterrolebinding.rbac.authorization.k8s.io/metallb-system:speaker created
rolebinding.rbac.authorization.k8s.io/config-watcher created
rolebinding.rbac.authorization.k8s.io/pod-lister created
Warning: spec.template.spec.selector[beta.kubernetes.io/os]: deprecated since v1.14; use "kubernetes.io/os" instead
daemonset.apps/speaker created
deployment.apps/controller created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create secret generic -n metallb-system memberlist --from-literal=secretkey="$(openssl rand -base64 128)"
secret/memberlist created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ minikube ip
192.168.49.2
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl create -f configmap.yaml
configmap/config created
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl delete svc nodejs-deployment
service "nodejs-deployment" deleted
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl expose deployment nodejs-deployment --type="LoadBalancer"
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$ kubectl get svc
NAME                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes           ClusterIP           10.96.0.1        <none>            443/TCP          105m
nodejs-deployment    LoadBalancer       10.108.24.64     192.168.79.61    3000:32272/TCP   17s
kavana@kavana-Inspiron-5567:~/Desktop/Assment_a/nodejs$
```

codelink:https://github.com/KAVANA-S-SALUNKHE/Devop_assignment1-code-