D.Y.Patil International University, Akurdi, Pune

School of Computer Science Engineering and Applications (SCSEA)

Final Year Engineering (B.Tech)

Cloud Automation & Devops CSE (CLC-4001)

Lab Manual

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Vision of the University:

"To Create a vibrant learning environment – fostering innovation and creativity, experiential learning, which is inspired by research, and focuses on regionally, nationally and globally relevant areas."

Mission of the School:

- *To provide a diverse, vibrant and inspirational learning environment.*
- *To establish the university as a leading experiential learning and research oriented center.*
- *To become a responsive university serving the needs of industry and society.*
- *To embed internationalization, employability and value thinking*

Cloud Automation & Devops CSE

Course Objectives:

1. To introduce DevOps principles and automation workflows for modern cloud environments.
2. To implement CI/CD pipelines and Infrastructure as Code (IaC) practices.
3. To apply containerization and orchestration techniques using Docker and Kubernetes.
4. To integrate DevOps tools with cloud-native services across AWS/Azure/GCP
5. To monitor, manage, and optimize cloud-deployed applications effectively

Course Outcomes:

On completion of the course, learner will be able to–

CO1	**Understand DevOps culture, lifecycle, and tools relevant to cloud automation**
CO2	**Implement version control and CI/CD practices for efficient delivery**
CO3	**Utilize Infrastructure as Code (IaC) and configuration management in cloud platforms.**
CO4	**Apply containerization and orchestration techniques using Docker and Kubernetes.**
CO5	**Integrate monitoring and cloud-native DevOps tools for application lifecycle management.**

Rules and Regulations for Laboratory:

- Students should be regular and punctual to all the Lab practical
- Lab assignments and practical should be submitted within given time.
- Mobile phones are strictly prohibited in the Lab.
- Please shut down the Computers beforeleaving the Lab.
- Please switch off the fans and lights and keep the chair in proper position before leaving the Lab
- Maintain proper discipline in Lab

D.Y.Patil International University, Akurdi, Pune

School of Computer Science Engineering and Applications

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Sr. No.	Name of the Practical	Date of Conducti on	Page No.		Sign of Teacher	Remarks*
			From	To		
1.	Git workflow with branching, merging, and pull requests					
2.	Setting up a Jenkins CI/CD pipeline for a sample project					
3.	Containerizing applications with Docker and Docker Compose					
4.	Setup the Docker swarm installation (master slave architecture)					
5.	Web application hosting with docker stack and docker compose (Voting_app)					
6.	Deploying multi-container on Kubernetes					

***Absent/Attended/Late/Partially Completed/Completed**

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CERTIFICATE

This certificate acknowledges that **Mr. Chandrabhushan Lilhare** , **PRN: 20220802020**, enrolled as a student in **FIY B.Tech (CSE) Track: Cloud Computing** has satisfactorily fulfilled the Practical Lab Assignments requirements for the year **2025-26** during the **VII SEM**, contributing to the partial completion of the **Cloud Automation & Devops** subject.

Hence Certified!!

Mr. Vishwajeet Jagtap
Subject Faculty

Dr. Rahul Sharma
Director, SCSEA

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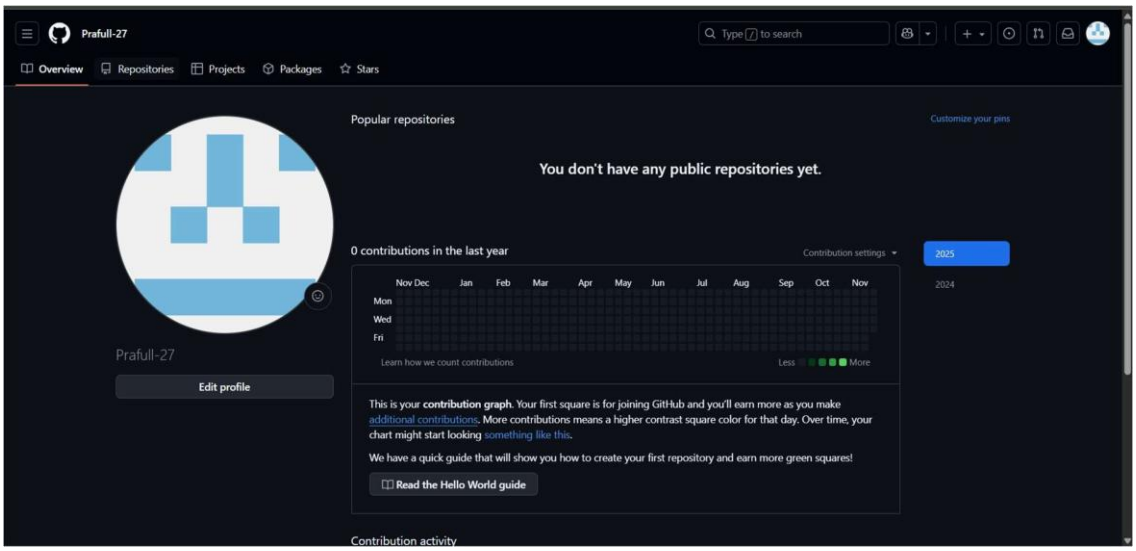
School of Computer Science, Engineering and Applications(SCSEA)
B.Tech FIY (CCSA)
Subject : Cloud Automation & Devops (P)

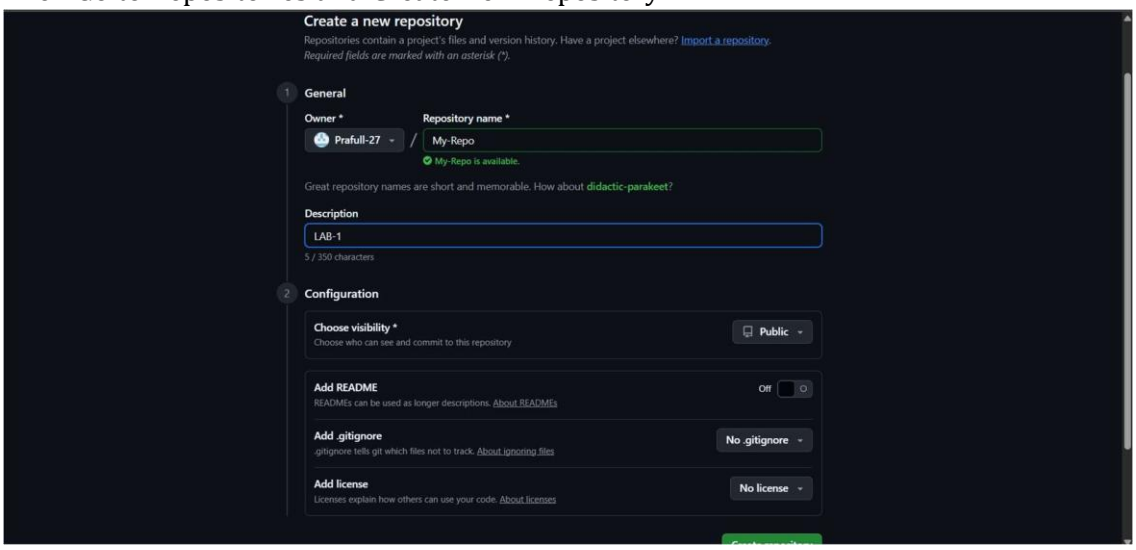
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **1.Git workflow with branching, merging, and pull requests**

1. Create account on GitHub



2. Then Go to Repositories and Create New Repository



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Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **1.Git workflow with branching, merging, and pull requests**

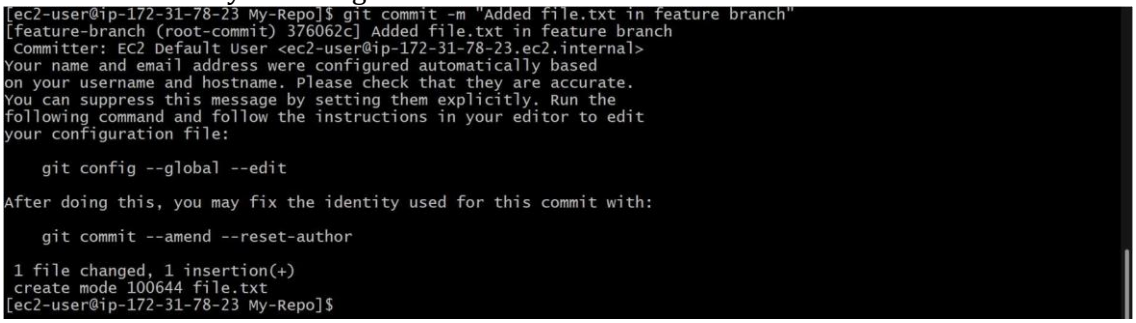
3. Now Clone This repository with Your system (ec2-instance).
   $ git clone https://github.com/Prafull-27/My-Repo.git

4. Now our pwd to repository .

5. Now Create New Branch.

6. Make changes in your branch:
   Edit or create any file.

7. Add and commit your changes



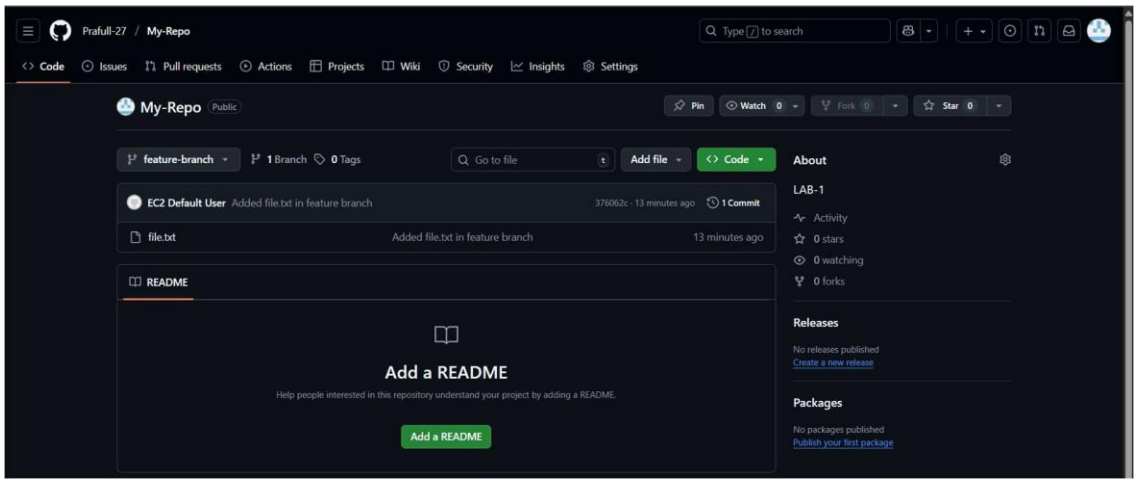
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **1.Git workflow with branching, merging, and pull requests**

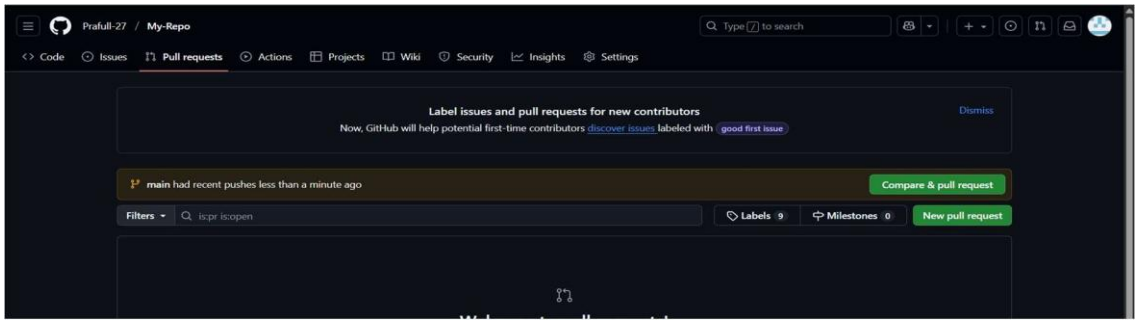
8. Push your branch to GitHub

```
[ec2-user@ip-172-31-78-23 My-Repo]$ git push -u origin feature-branch
Username for 'https://github.com': Prafull-27
Password for 'https://Prafull-27@github.com':
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 263 bytes | 263.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Prafull-27/My-Repo.git
 * [new branch]      feature-branch -> feature-branch
branch 'feature-branch' set up to track 'origin/feature-branch'.
[ec2-user@ip-172-31-78-23 My-Repo]$ ls
file.txt
```

9. Create Pull Request (PR)
   Go to your GitHub repo



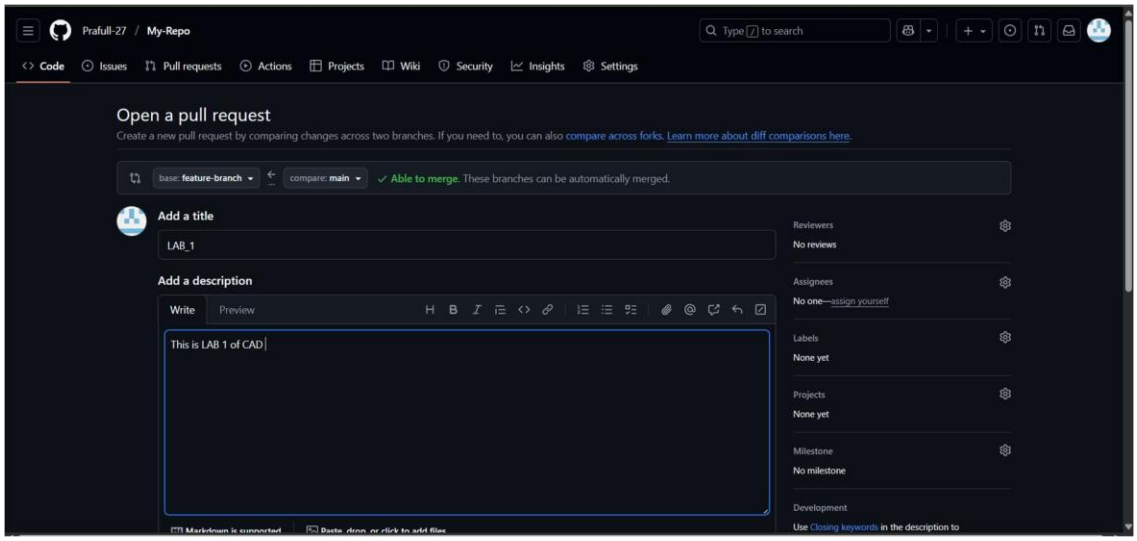
You will see a **Compare & Pull Request** button → click it



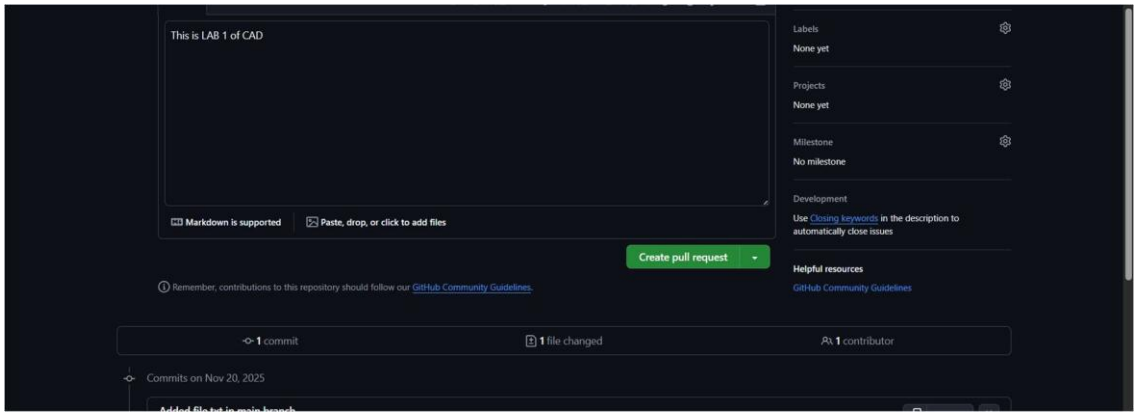
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **1.Git workflow with branching, merging, and pull requests**

Add a title and description



Click Create Pull Request



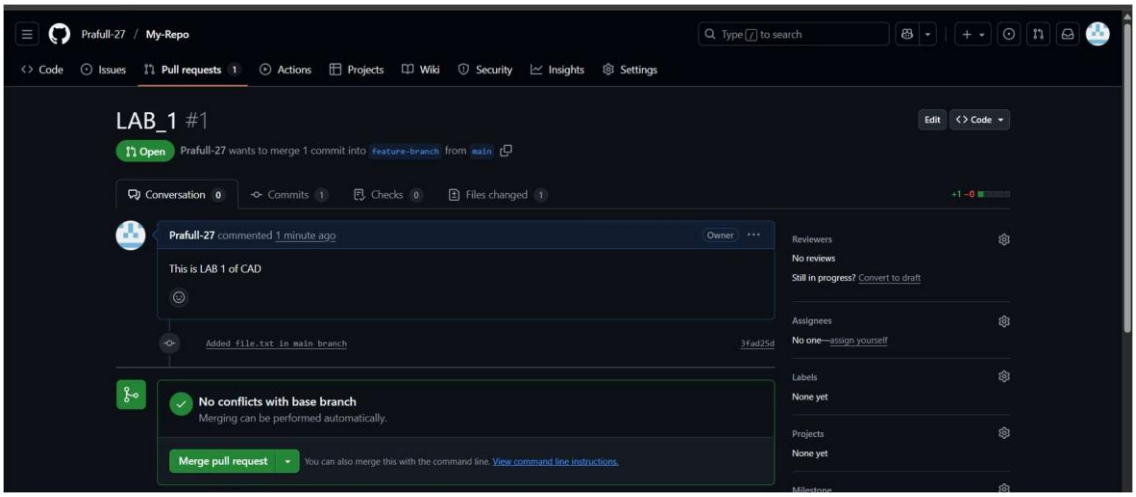
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **1.Git workflow with branching, merging, and pull requests**

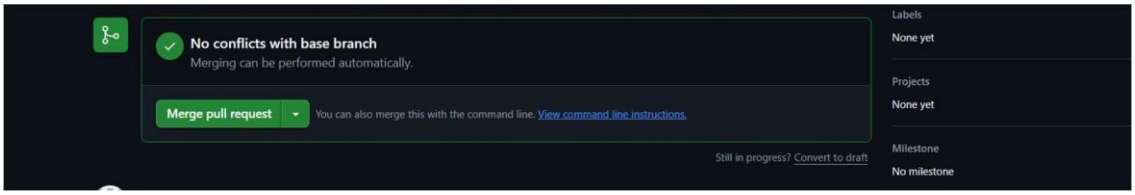
10. Review and Merge PR

On GitHub:

1. Open the PR



2. Click **Merge Pull Request**



3. Then click **Confirm Merge**

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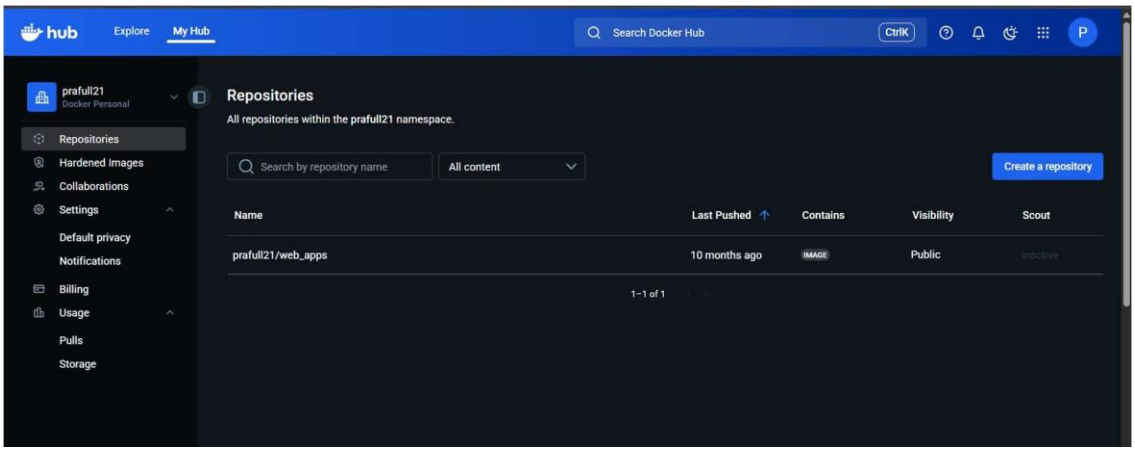
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

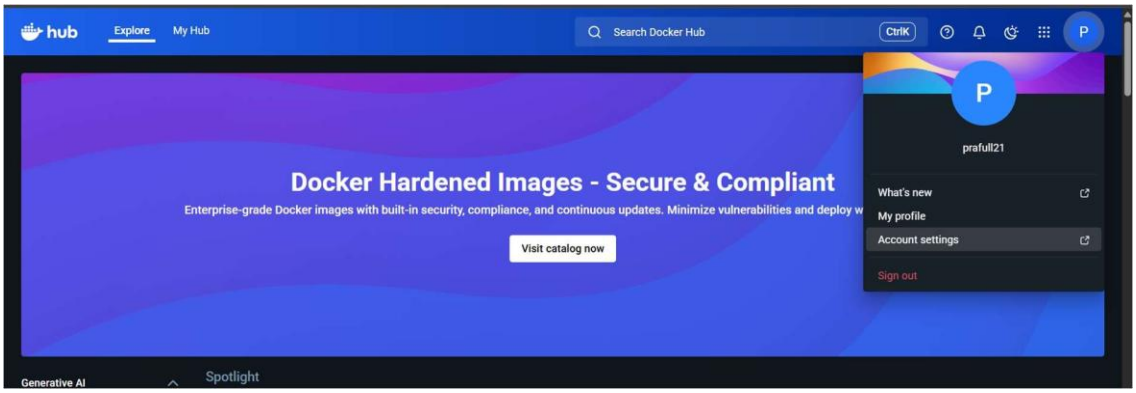
Title of Practicle : **2. Setting up a Jenkins CI/CD pipeline for a sample project**

Step 1 Create Docker Hub account.



Step 2 — Generate Docker Hub Access Token

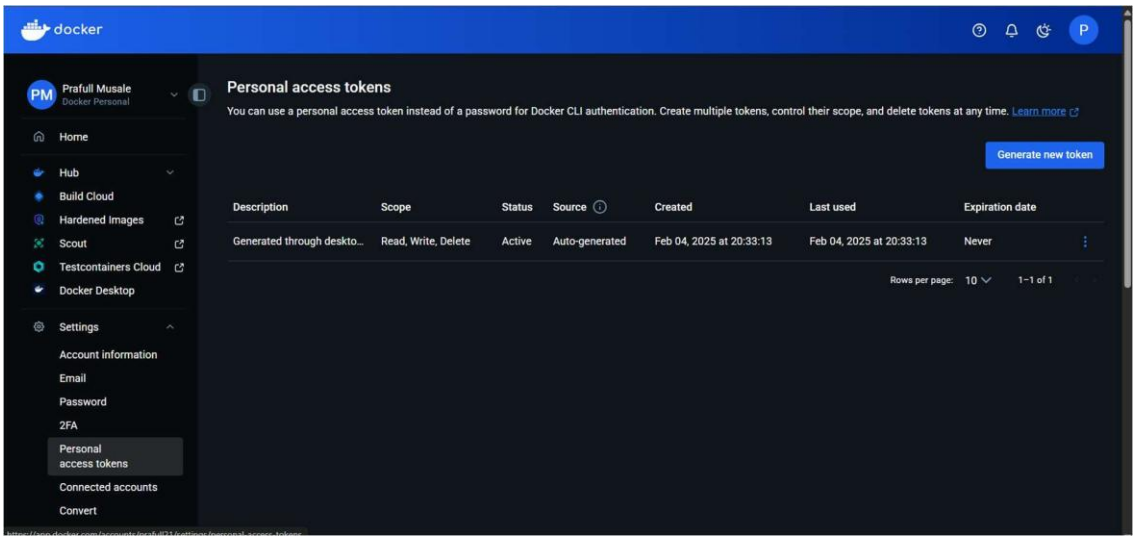
1. Go to **Account Settings**



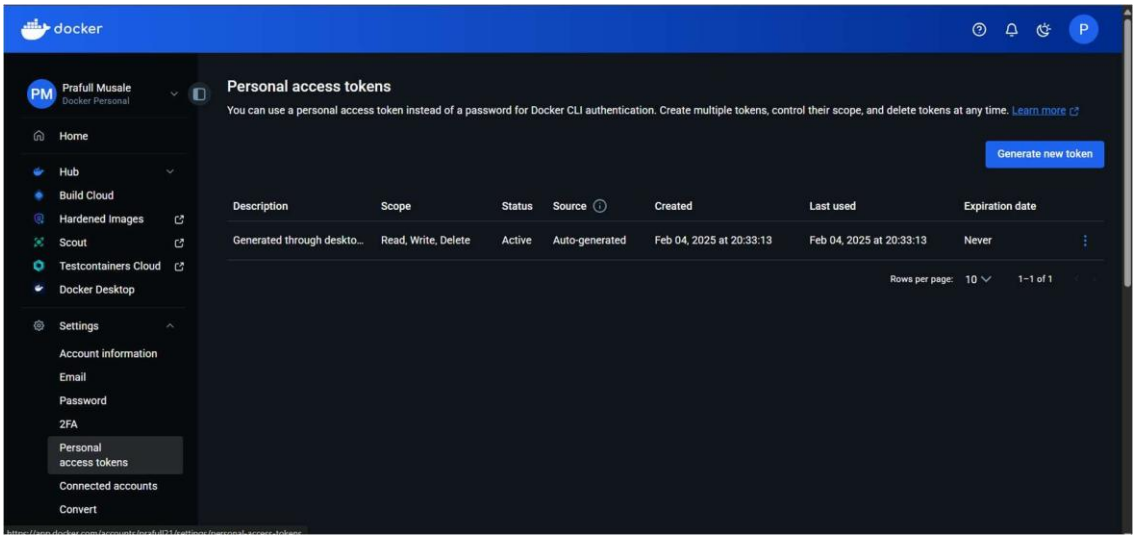
Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : **2. Setting up a Jenkins CI/CD pipeline for a sample project**

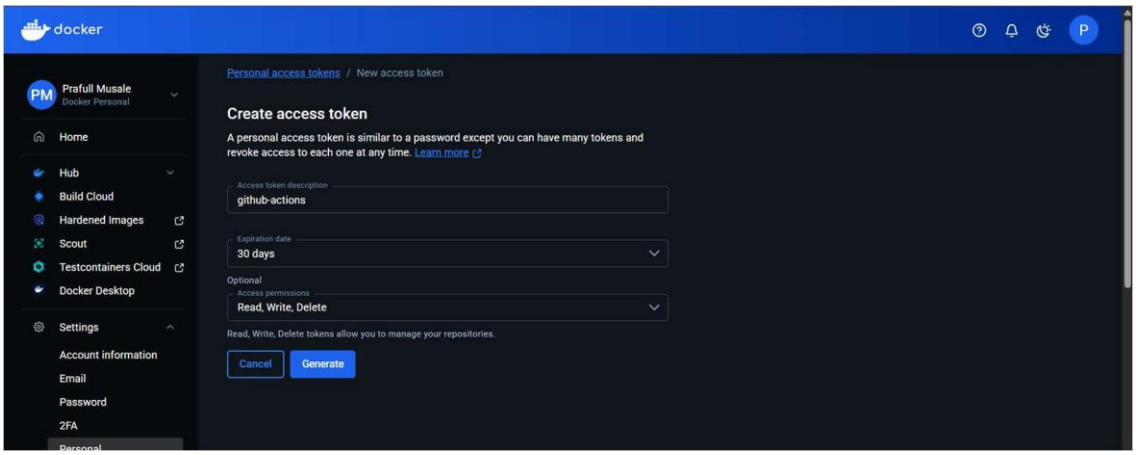
2. Click **Person Access Token**



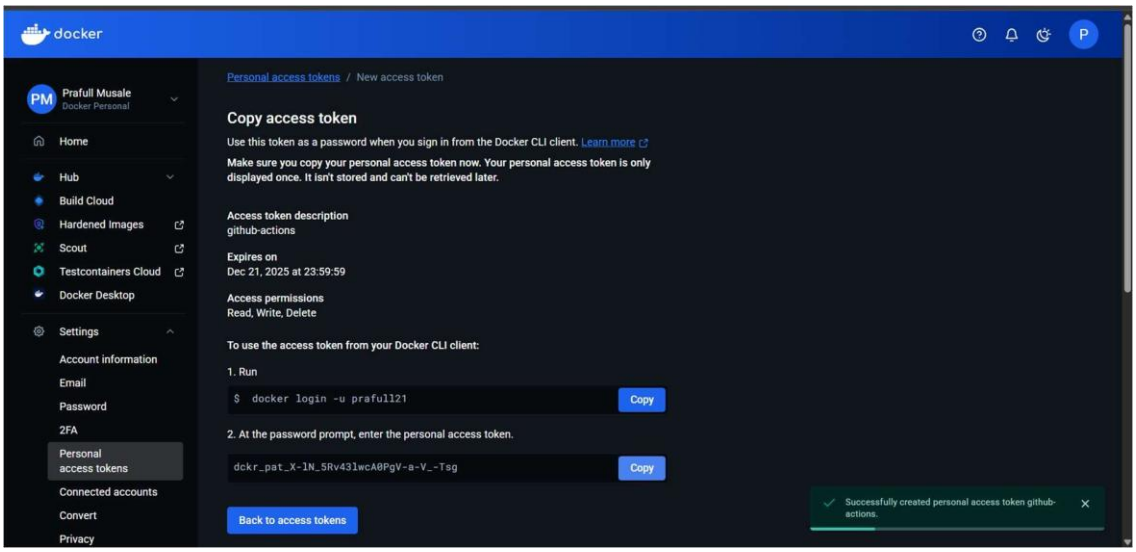
3. Click **New Access Token**



4. Name: github-actions

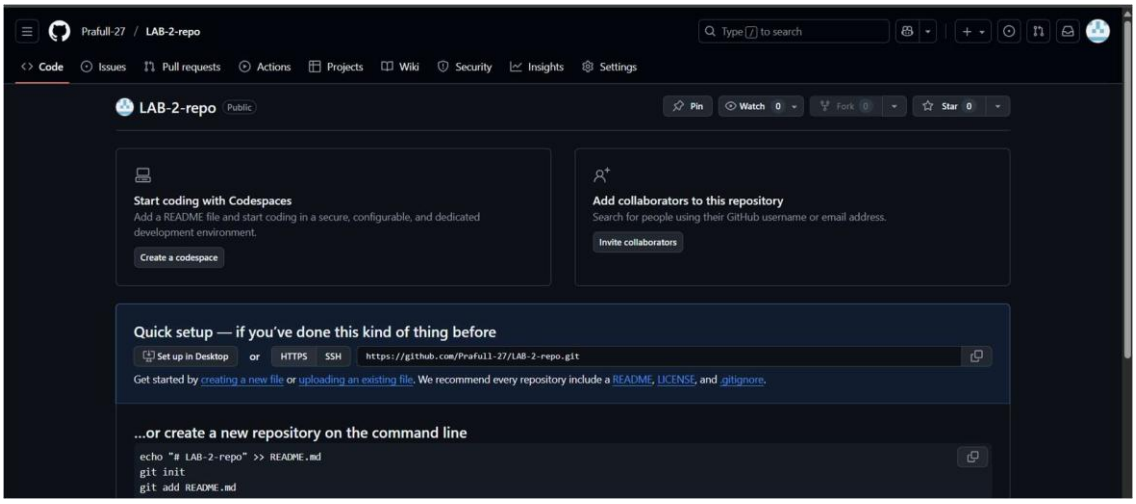


5. Copy the token (you will use it soon)



Step 3 — Add Secrets in GitHub Repository

1. Open your repository



2. Go to:
   Settings → Secrets and variables → Actions → New repository secret

Create two secrets:

Secret 1:

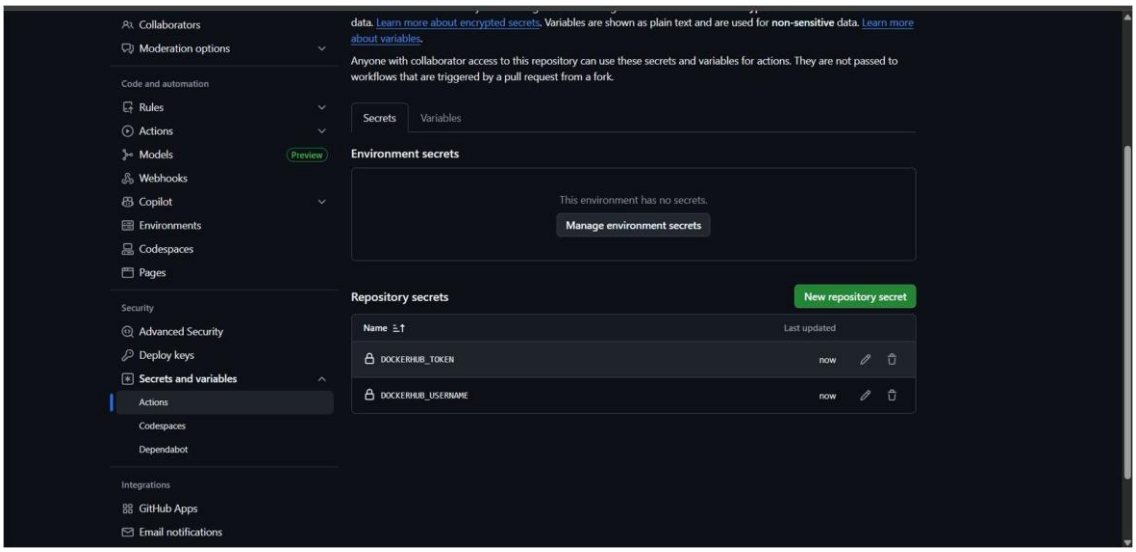
- Name: DOCKERHUB_USERNAME
- Value: your Docker Hub username

Secret 2:

- Name: DOCKERHUB_TOKEN
- Value: the token you generated in Step 2

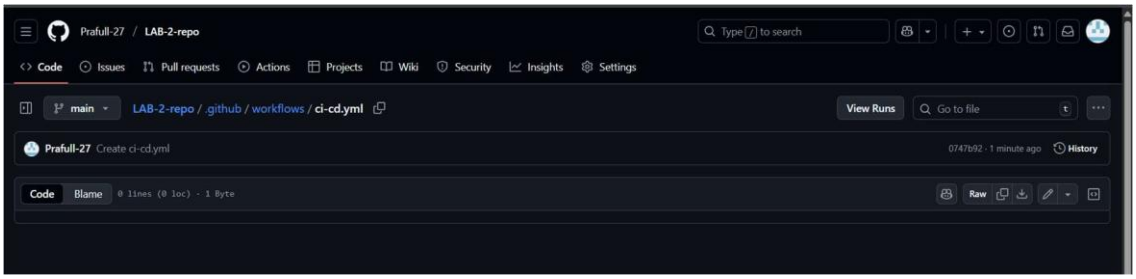
Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : **2. Setting up a Jenkins CI/CD pipeline for a sample project**



Step 4 — Create Workflow Folder

In your repository, create this folder: .github/workflows/



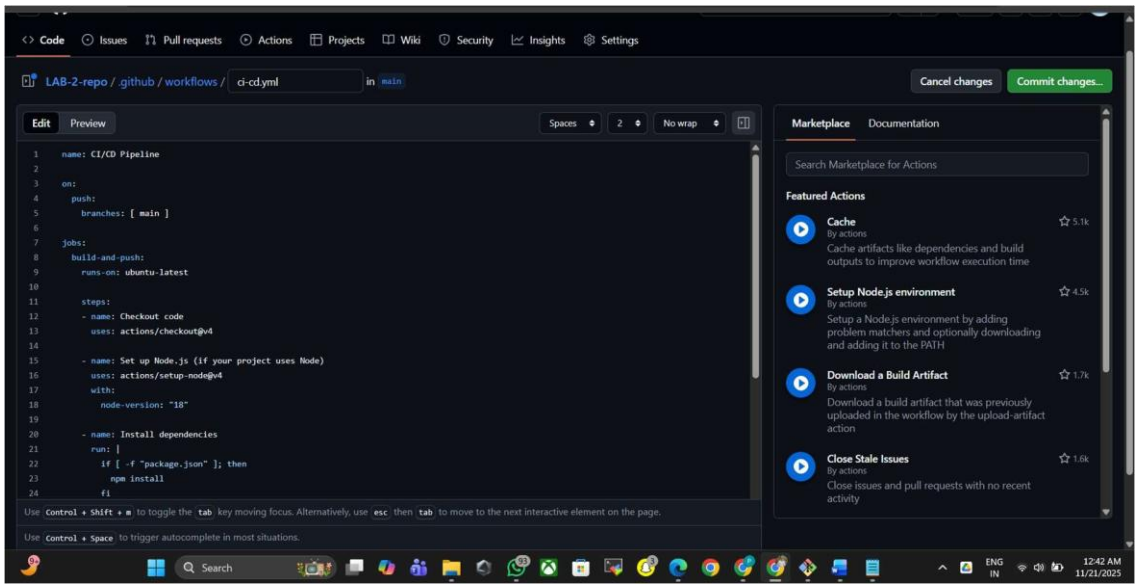
Step 5 — Create Workflow File (CI/CD File)

Inside .github/workflows/, create a file

Paste this code inside (simple CI/CD pipeline)

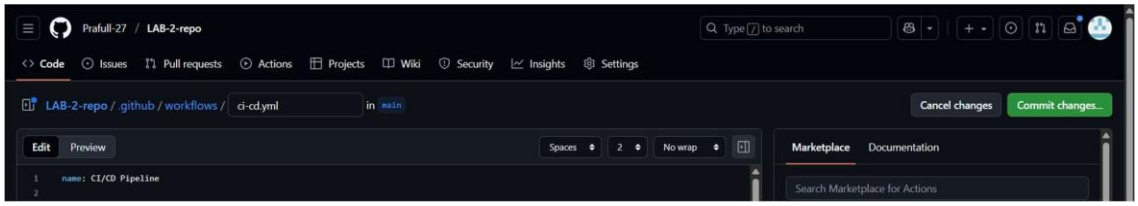
Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : **2. Setting up a Jenkins CI/CD pipeline for a sample project**



Step 6 — Commit & Push

If you push to the **main branch**, the pipeline runs automatically.

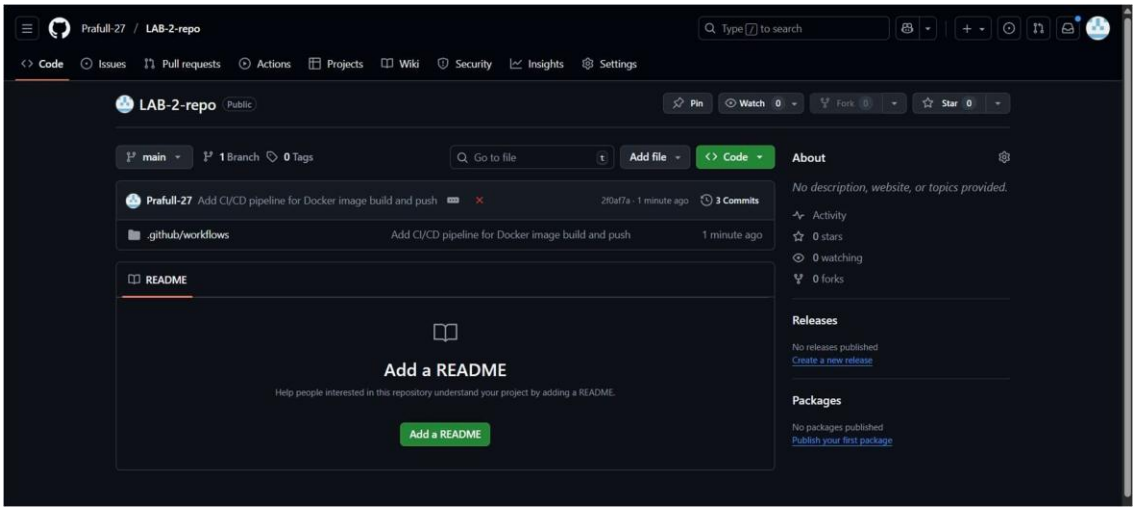


Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

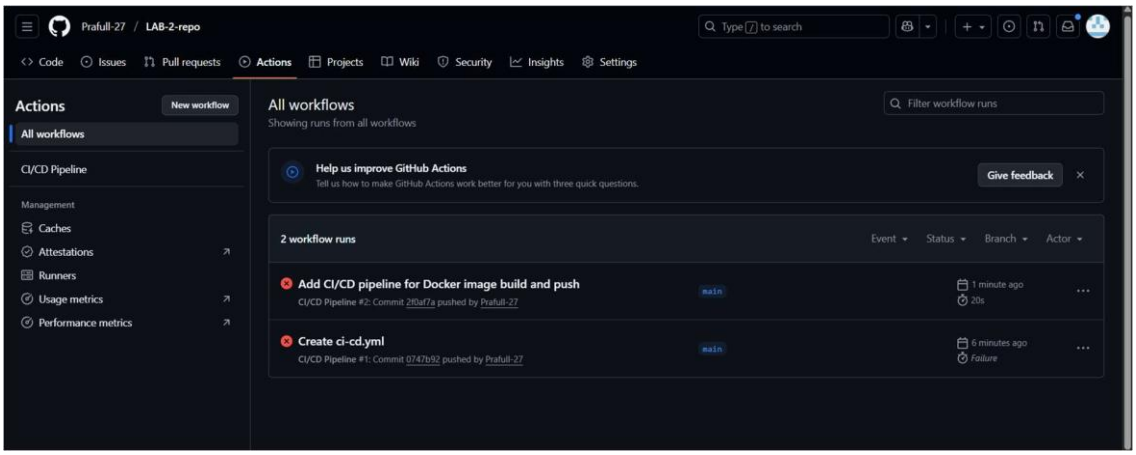
Title of Practicle : **2. Setting up a Jenkins CI/CD pipeline for a sample project**

Step 7 — Check the GitHub Actions Pipeline

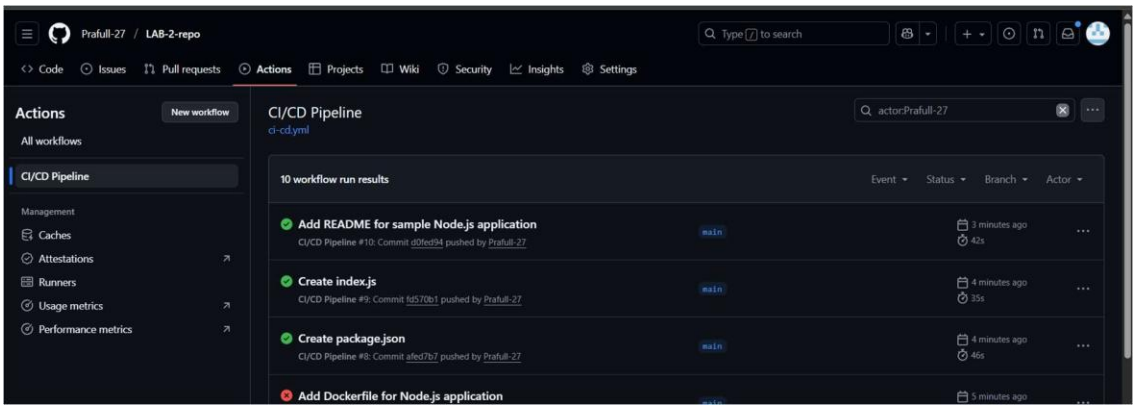
1. Go to your repository



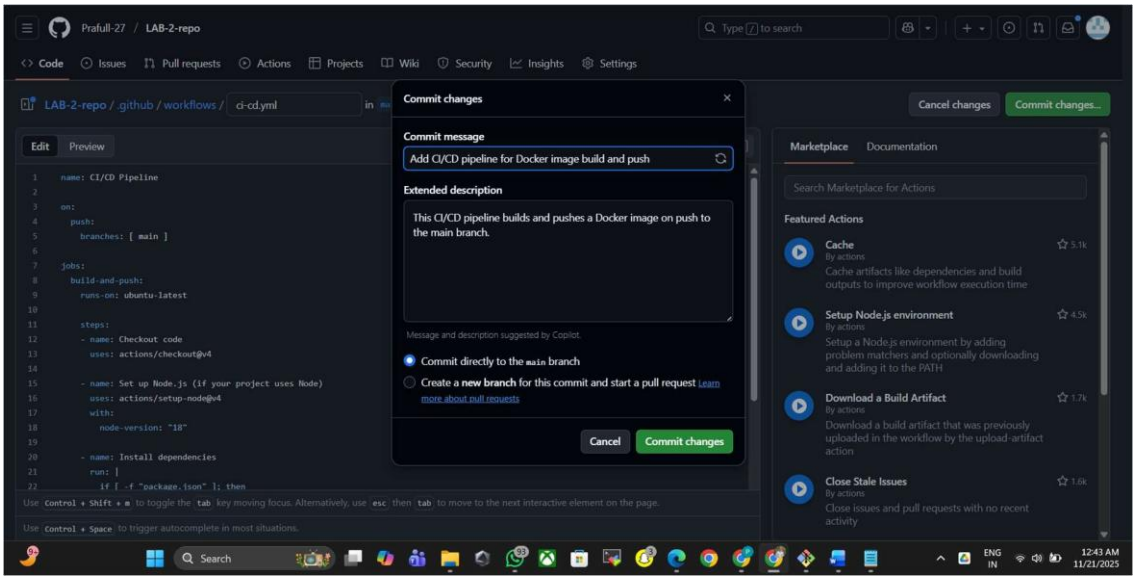
2. Click **Actions**



3. You will see a new workflow running



4. Click it → you can see all logs: build, test, docker push, etc.



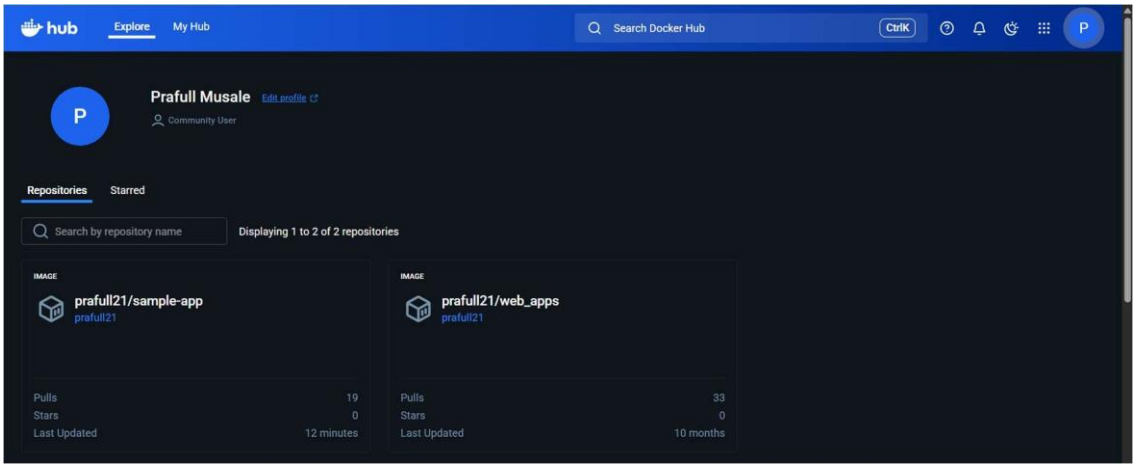
Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : **2. Setting up a Jenkins CI/CD pipeline for a sample project**

Step 8 — Confirm Docker Image in Docker Hub

Go to Docker Hub → Repositories →
You will see:

- sample-app:latest
- sample-app:<build-number>



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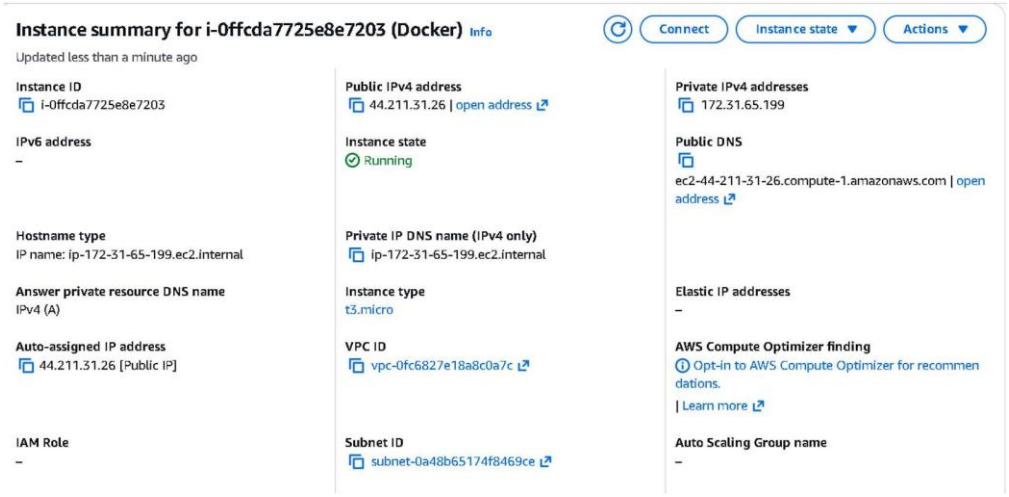
Name of the Student:	**Chandrabhushan Lilhare**	**PRN: 20220802020**
Title of Practicle :	**3. Containerizing applications with Docker and Docker Compose**	

1. Launch the instance.

Name: Docker

AMI: Amazon Linux2023

Instance Type: t3.micro



2. Install the Docker & Docker Compose.

sudo yum update -y

sudo dnf install docker -y

sudo systemctl start docker

sudo systemctl enable docker

sudo usermod -aG docker ec2-user

sudo usermod -aG docker $USER

sudo curl -L "https://github.com/docker/compose/releases/download/v2.29.2/docker-compose-linux-x86_64" -o /usr/local/bin/docker-compose

Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

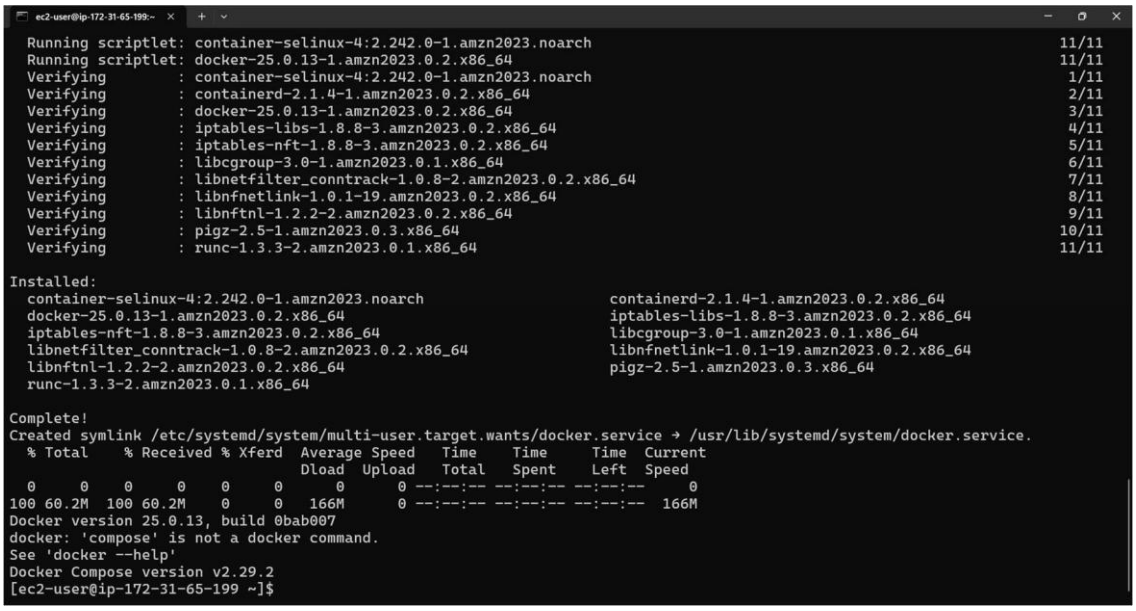
Title of Practicle : **3. Containerizing applications with Docker and Docker Compose**

sudo chmod +x /usr/local/bin/docker-compose

docker --version

docker compose version

docker-compose version



Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : 3. Containerizing applications with Docker and Docker Compose

3. Create Your Project Folder

mkdir myapp

cd myapp

4. Add Your Application Code

Example: Node.js Express app

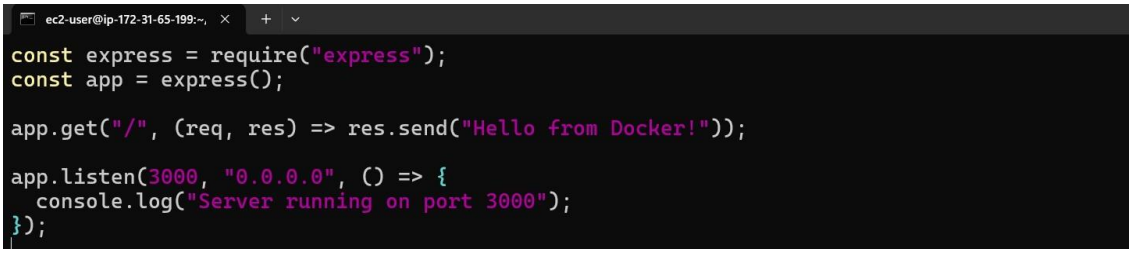
Create app.js

$ vi app.js

```
const express = require("express");

const app = express();


app.get("/", (req, res) => res.send("Hello from Docker!"));


app.listen(3000, () => console.log("Server running on port 3000"));
```

Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : **3. Containerizing applications with Docker and Docker Compose**



Create package.json

$ package.json

{

"name": "docker-app",

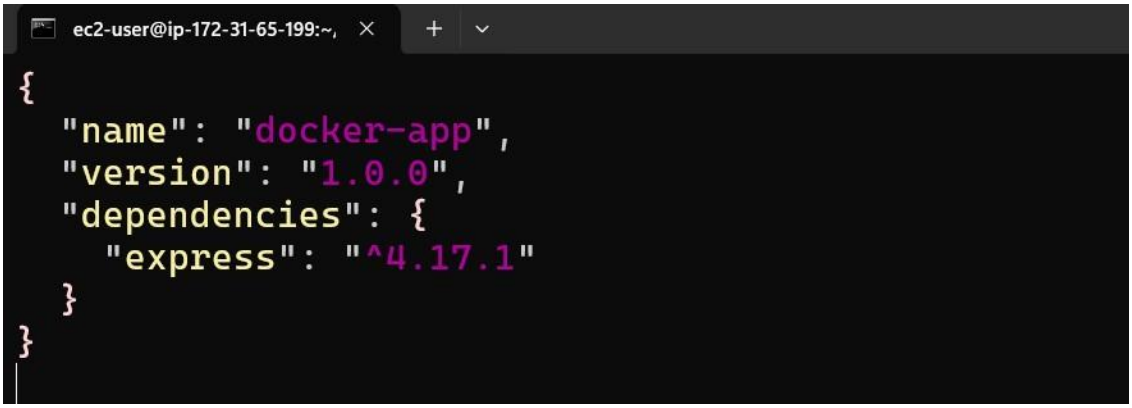
"version": "1.0.0",

"dependencies": {

"express": "^4.17.1"

}

}



Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : 3. Containerizing applications with Docker and Docker Compose

5. Write the Dockerfile

Create Dockerfile

$ vi dockerfile

FROM node:18

WORKDIR /app

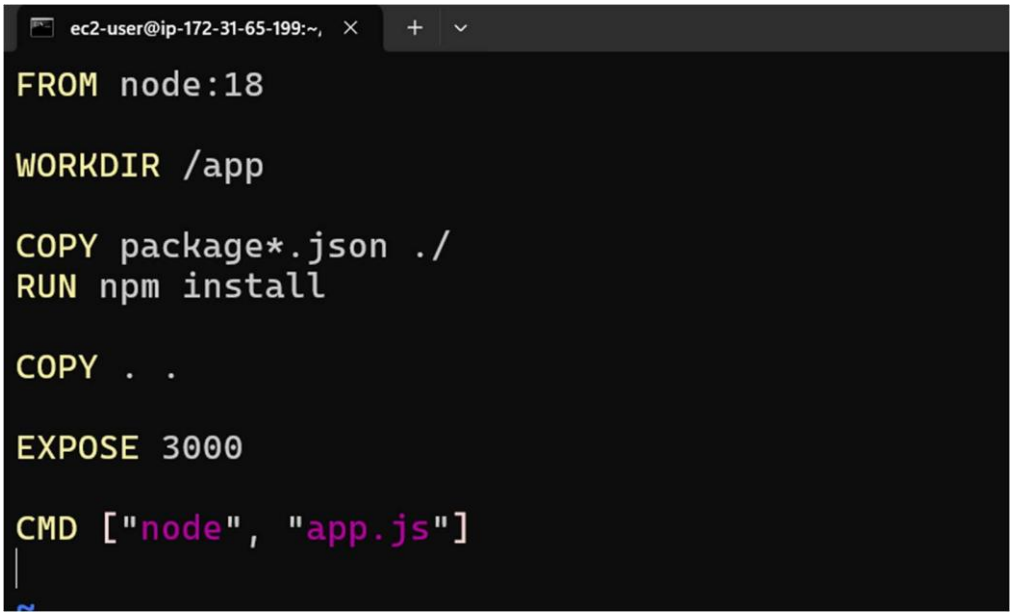
COPY package*.json ./

RUN npm install

COPY . .

EXPOSE 3000

CMD ["node", "app.js"]

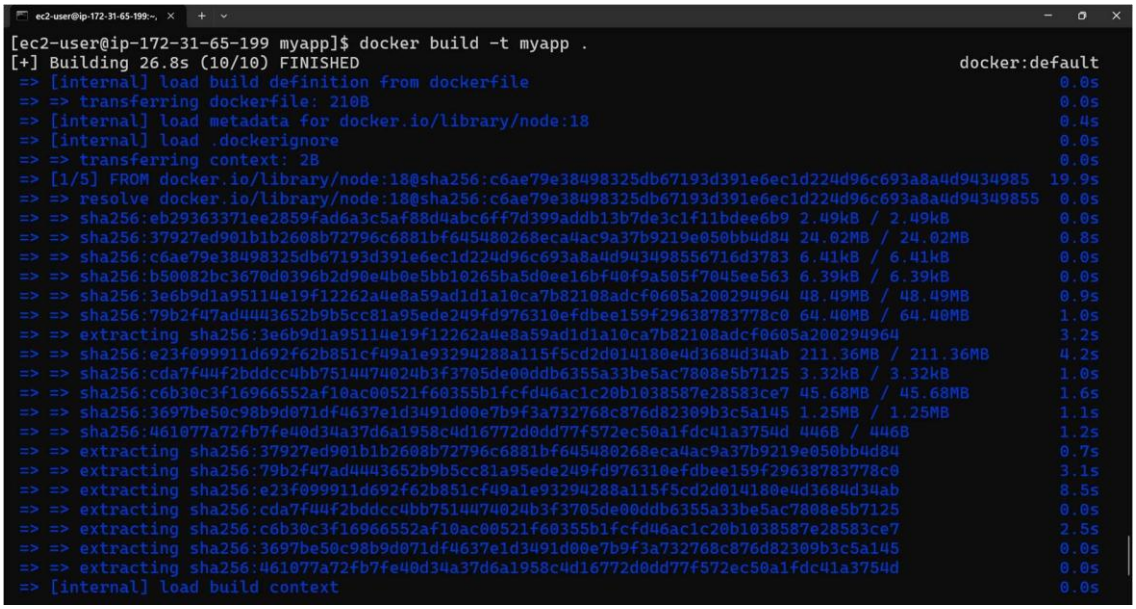


Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : 3. Containerizing applications with Docker and Docker Compose

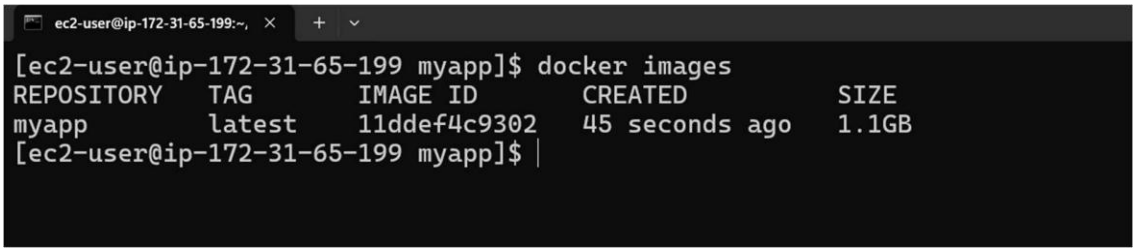
6. Build Docker Image

$ docker build -t myapp .



Check image:

$ docker images

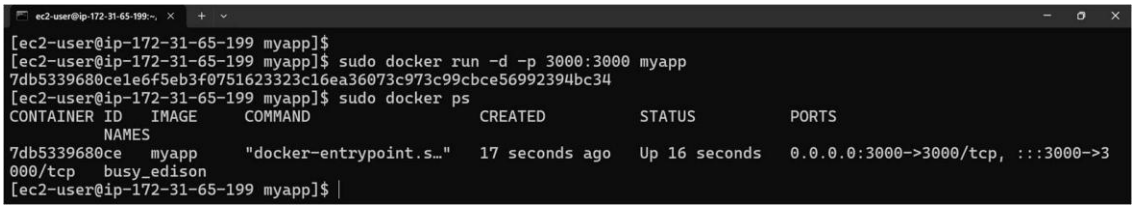


Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : 3. Containerizing applications with Docker and Docker Compose

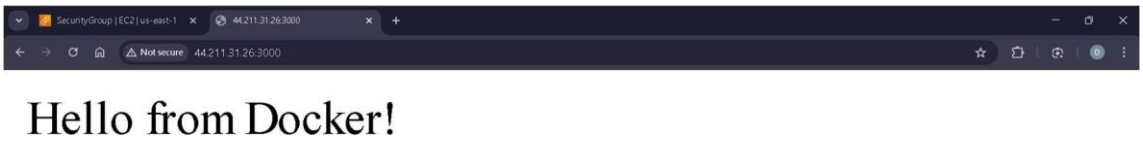
7. Run Container (Without Compose)

$ docker run -d -p 3000:3000 --name myapp_container myapp



Test:

http://<ip>:3000



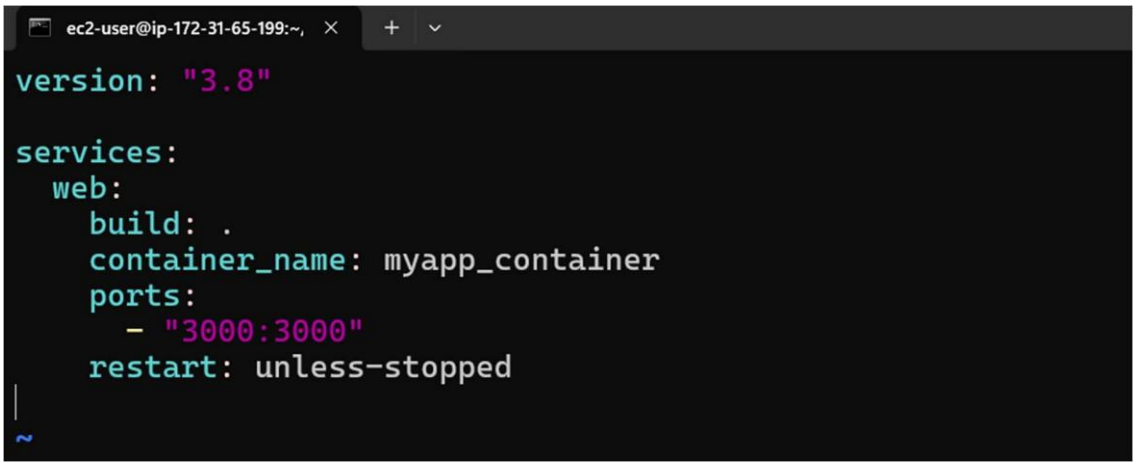
8. Create docker-compose.yml

$ docker-compose.yml

```
version: "3.8"
services:
  web:
    build: .
    container_name: myapp_container
    ports:
      - "3000:3000"
    restart: unless-stopped
```

Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

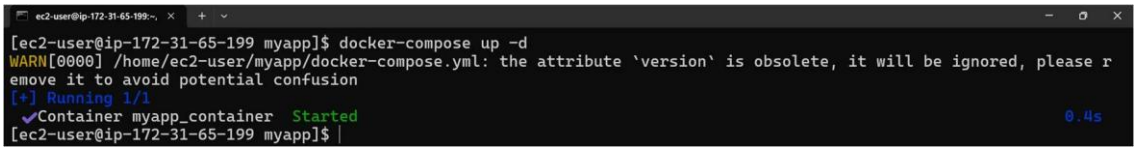
Title of Practicle : 3. Containerizing applications with Docker and Docker Compose



9. Run Using Docker Compose

Start:

$ docker-compose up -d



Check running:

$ docker ps

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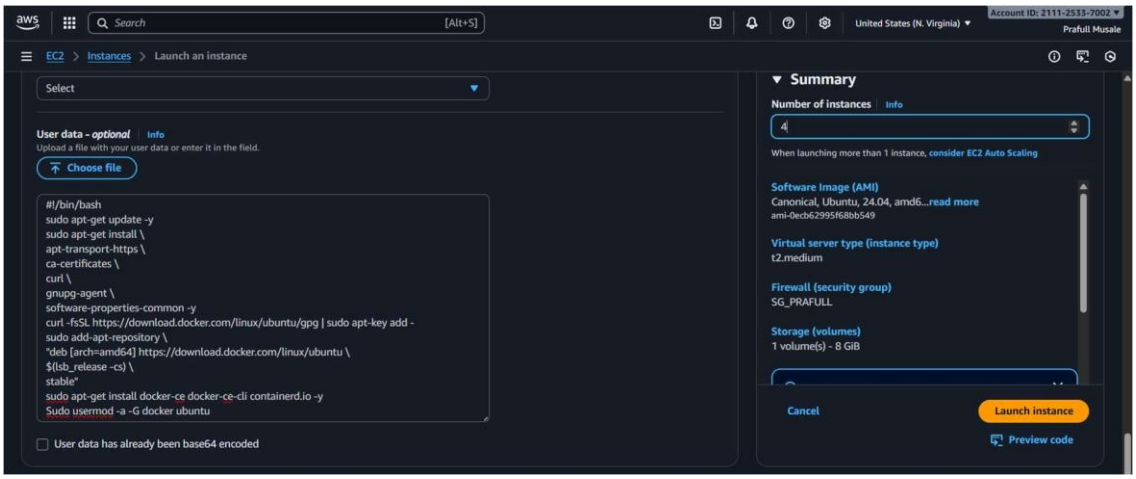
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **4.** Setup the Docker swarm installation (master slave architecture)

1. Launch 4 instance with docker installation



2. Connect all instance to terminal

3. Now, Fire $ sudo docker swarm init at 1st instance for give him leadership

```
ubuntu@ip-172-31-24-195:~$ sudo docker swarm init
Swarm initialized: current node (xr2iq9wci3jygl8orvt34m3nx) is now a manager.

To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.
ubuntu@ip-172-31-24-195:~$
```

Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **4.** Setup the Docker swarm installation (master slave architecture)

4. Now generate token for manager and worker with following commands

$ docker swarm join-token manager

$ docker swarm join-token worker

```
ubuntu@ip-172-31-24-195:~$ docker swarm join-token manager
To add a manager to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54qr0bf0k-5y9s
zo95v0z27sbircs2dxp4v 172.31.24.195:2377

ubuntu@ip-172-31-24-195:~$ docker swarm join-token worker
To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54qr0bf0k-7oub
d4f7165zxrw417m28b3qj 172.31.24.195:2377

ubuntu@ip-172-31-24-195:~$
```

5. Now join 2nd instance as a manger with the help of token

Copy manager token and paste into 2nd instance

```
ubuntu@ip-172-31-18-27:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54q
r0bf0k-5y9szo95v0z27sbircs2dxp4v 172.31.24.195:2377
This node joined a swarm as a manager.
ubuntu@ip-172-31-18-27:~$
```

6. Join 3rd and 4th instance as a worker with the help of token

Copy worker token and paste into 3rd and 4th instance

```
ubuntu@ip-172-31-25-4:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlh
hc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377
This node joined a swarm as a worker.
ubuntu@ip-172-31-25-4:~$
```

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Title of Practicle : **4.** Setup the Docker swarm installation (master slave architecture)

```
ubuntu@ip-172-31-20-92:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enl
hhc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377
This node joined a swarm as a worker.
ubuntu@ip-172-31-20-92:~$
```

7. Now check which node is worker and which node is manager with the help of following command . This command fire on manager node because only manager or leader can show this .

$ docker node ls

```
ubuntu@ip-172-31-24-195:~$ docker node ls
ID                            HOSTNAME            STATUS    AVAILABILITY   MANAGER STATUS   ENG
INE VERSION
z0fyvuh1hyt06dz676oly2e8m     ip-172-31-18-27     Ready     Active         Reachable        29.
0.2
aodb8f1fbdguax83e4xyxrrmq     ip-172-31-20-92     Ready     Active                          29.
0.2
xr2iq9wci3jygl8orvt34m3nx *   ip-172-31-24-195    Ready     Active         Leader           29.
0.2
atiwsk98cxw05ydhitdxuac1s     ip-172-31-25-4      Ready     Active                          29.
0.2
ubuntu@ip-172-31-24-195:~$
```

8. Now same command fire on worker node

Check worker has access or not

```
ubuntu@ip-172-31-25-4:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlh
hc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377
This node joined a swarm as a worker.
ubuntu@ip-172-31-25-4:~$ sudo docker node ls
Error response from daemon: This node is not a swarm manager. Worker nodes can't be us
ed to view or modify cluster state. Please run this command on a manager node or promo
te the current node to a manager.
ubuntu@ip-172-31-25-4:~$
```

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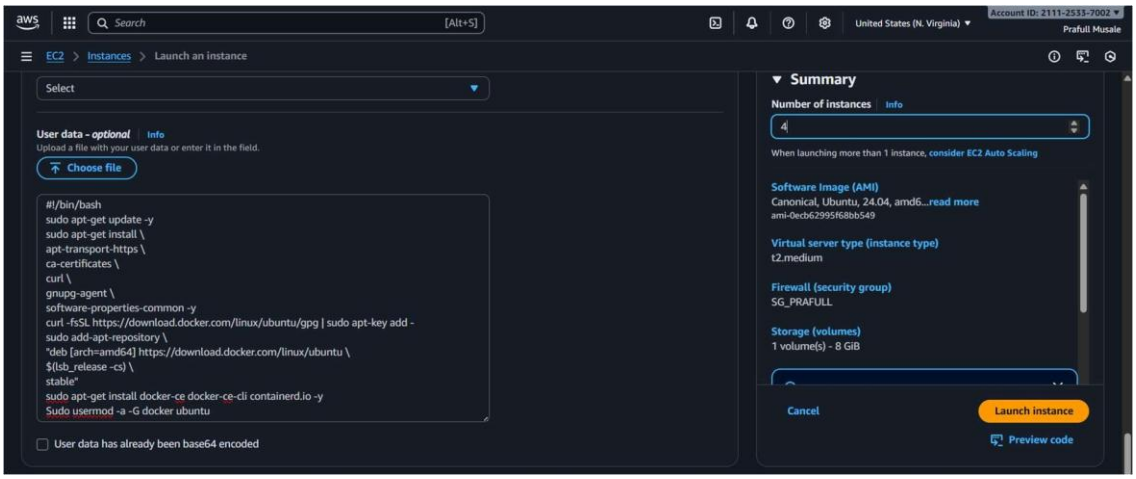
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **5.** Web application hosting with docker stack and docker compose (Voting_app)

1. Launch 4 instance with docker installation



2. Connect all instance to terminal

3. Now, Fire $ sudo docker swarm init at 1st instance for give him leadership

```
ubuntu@ip-172-31-24-195:~$ sudo docker swarm init
Swarm initialized: current node (xr2iq9wci3jygl8orvt34m3nx) is now a manager.

To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.
ubuntu@ip-172-31-24-195:~$
```

4. Now generate token for manager and worker with following commands

$ docker swarm join-token manager

$ docker swarm join-token worker

```
ubuntu@ip-172-31-24-195:~$ docker swarm join-token manager
To add a manager to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54qr0bf0k-5y9s
zo95v0z27sbircs2dxp4v 172.31.24.195:2377

ubuntu@ip-172-31-24-195:~$ docker swarm join-token worker
To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54qr0bf0k-7oub
d4f7165zxrw417m28b3qj 172.31.24.195:2377

ubuntu@ip-172-31-24-195:~$
```

5. Now join 2nd instance as a manger with the help of token

Copy manager token and paste into 2nd instance

```
ubuntu@ip-172-31-18-27:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlhhc333wlxzyj35vu54q
r0bf0k-5y9szo95v0z27sbircs2dxp4v 172.31.24.195:2377
This node joined a swarm as a manager.
ubuntu@ip-172-31-18-27:~$
```

6. Join 3rd and 4th instance as a worker with the help of token

Copy worker token and paste into 3rd and 4th instance

```
ubuntu@ip-172-31-25-4:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enlh
hc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377
This node joined a swarm as a worker.
ubuntu@ip-172-31-25-4:~$
```

Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **5.** Web application hosting with docker stack and docker compose (Voting_app)

```
ubuntu@ip-172-31-20-92:~$ docker swarm join --token SWMTKN-1-3qcxdb5nvejucsv2csp940enl
hhc333wlxzyj35vu54qr0bf0k-7oubd4f7165zxrw417m28b3qj 172.31.24.195:2377
This node joined a swarm as a worker.
ubuntu@ip-172-31-20-92:~$
```

7. Now create docker-stack.yml to write the services

```
version: "3.9"

services:

  redis:
    image: redis:alpine
    networks:
      - frontend

  db:
    image: postgres:15-alpine
    environment:
      POSTGRES_USER: "postgres"
      POSTGRES_PASSWORD: "postgres"
    volumes:
      - db-data:/var/lib/postgresql/data
    networks:
      - backend

  vote:
    image: dockersamples/examplevotingapp_vote
    ports:
      - 5000:80
    networks:
      - frontend
    deploy:
      replicas: 2

  result:
    image: dockersamples/examplevotingapp_result
    ports:
      - 5001:80
    networks:
      - backend

  worker:
    image: dockersamples/examplevotingapp_worker
    networks:
      - frontend
      - backend
    deploy:
      replicas: 2

networks:
  frontend:
  backend:

volumes:
  db-data:
ubuntu@ip-172-31-24-195:~$
```

8. Now deploy with stack with the following command

$ docker stack deploy -c docker-stack.yml votingapp

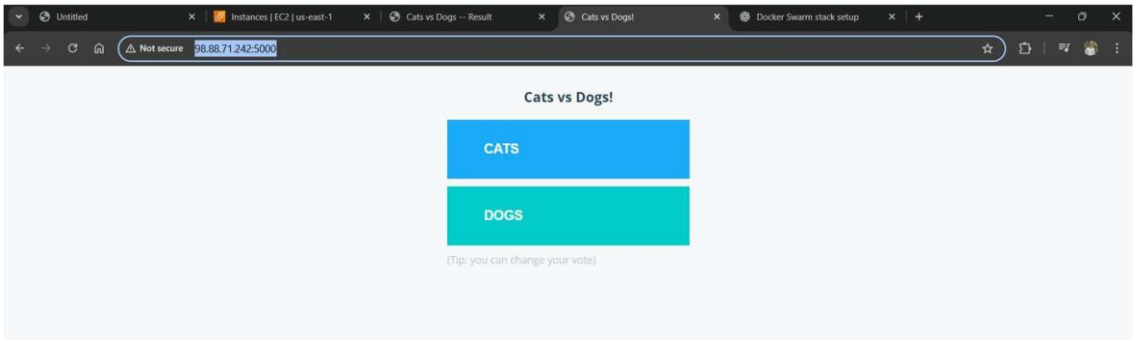
```
ubuntu@ip-172-31-24-195:~$ docker stack deploy -c docker-stack.yml votingapp
Since --detach=false was not specified, tasks will be created in the background.
In a future release, --detach=false will become the default.
Creating network votingapp_backend
Creating network votingapp_frontend
Creating service votingapp_result
Creating service votingapp_worker
Creating service votingapp_redis
Creating service votingapp_db
Creating service votingapp_vote
```

9. Now check stack is created or not with following command

$docker stack ls

```
ubuntu@ip-172-31-24-195:~$ docker stack ls
NAME        SERVICES
votingapp   5
ubuntu@ip-172-31-24-195:~$
```

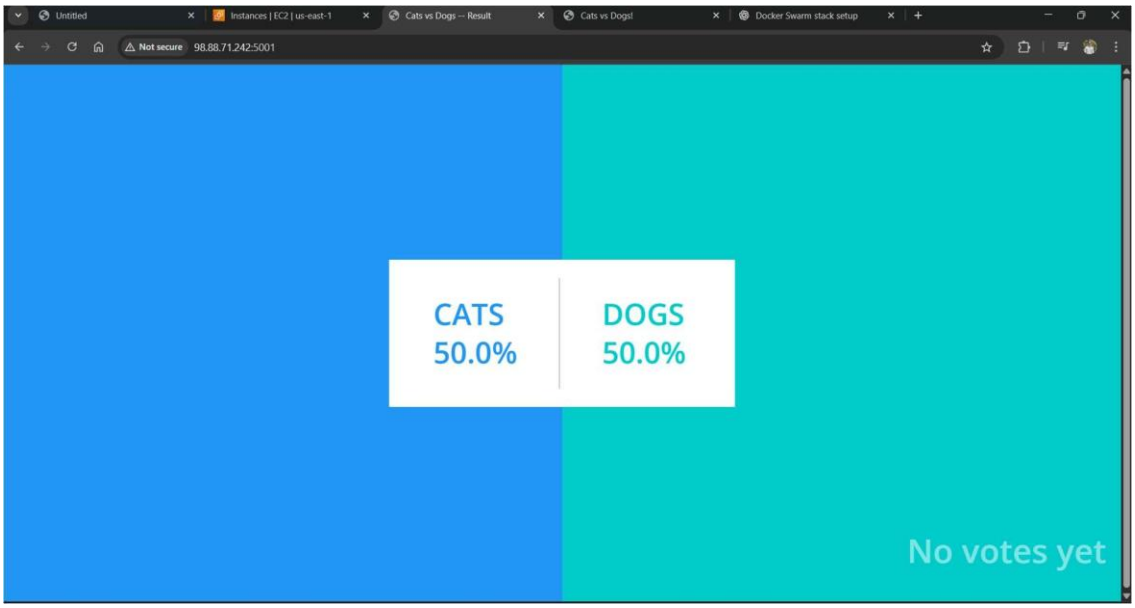
10. Now for voting enter on browser <Public-IP>:5000



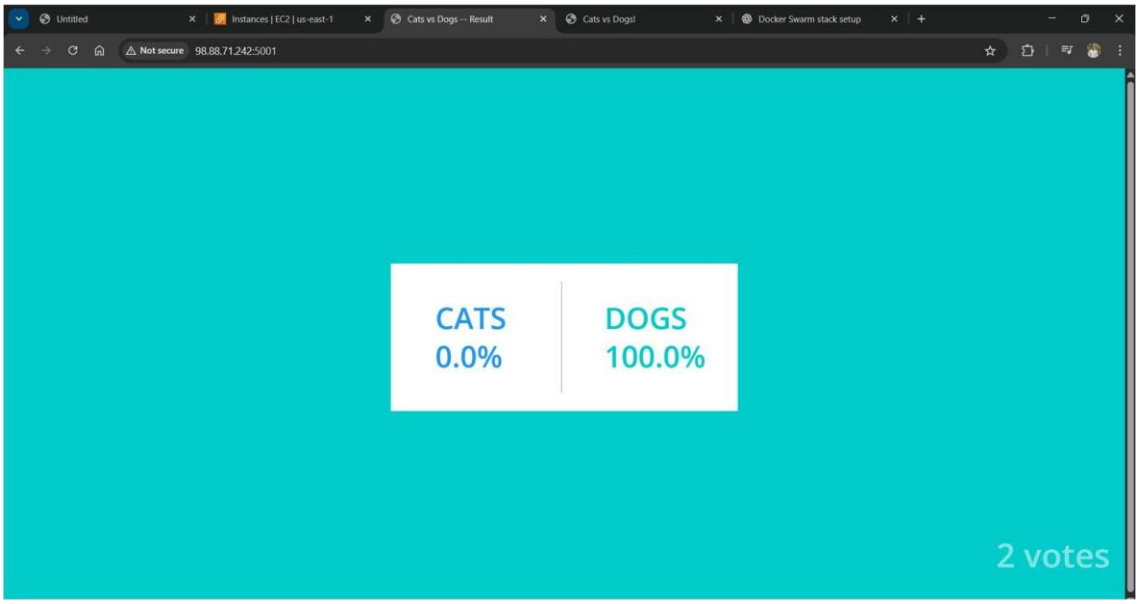
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **5.** Web application hosting with docker stack and docker compose (Voting_app)

11. For checking Result enter on browser <Public-IP>:5001



12. Our Voting app is properly working



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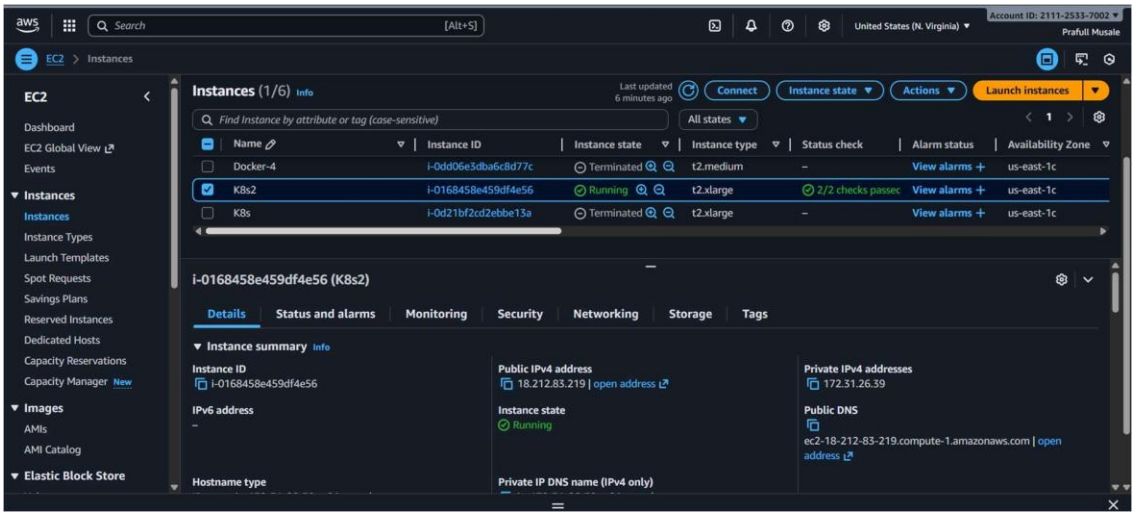
Name of the Student: **Chandrabhushan Lilhare** **PRN: 20220802020**

Title of Practicle : **6. Deploying multi-container on Kubernetes**

1. Launch an instance with installation of docker and Kubernetes



2. User data for installation

```
#!/bin/bash
sudo apt-get update -y
sudo apt-get install \
apt-transport-https \
ca-certificates \
curl \
gnupg-agent \
software-properties-common -y
curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
sudo add-apt-repository \
"deb [arch=amd64] https://download.docker.com/linux/ubuntu \
$(lsb_release -cs) \
```

```
stable"

sudo apt-get install docker-ce docker-ce-cli containerd.io -y

sudo usermod -a -G docker ubuntu

 # Initialize Kubernetes cluster

sudo kubeadm init --pod-network-cidr=192.168.0.0/16 --ignore-preflight-
errors=NumCPU || (echo 'Failed to initialize cluster' && exit 1)


# Setup kubectl

mkdir -p $HOME/.kube ; sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config ||
echo 'Failed to copy admin.conf' ; sudo chown $(id -u):$(id -g) $HOME/.kube/config ||
echo 'Failed to change ownership of config'


# Install Calico CNI

kubectl apply -f
https://raw.githubusercontent.com/projectcalico/calico/v3.28.3/manifests/calico.yam
l


# Save join command with full permissions

sudo kubeadm token create --print-join-command
```

Name of the Student: Chandrabhushan Lilhare **PRN: 20220802020**

Title of Practicle : 6. Deploying multi-container on Kubernetes

3. Now create multi-container.yml file

```
apiVersion: v1
kind: Pod
metadata:
  name: two-containers
spec:
  restartPolicy: OnFailure
  initContainers:
    - name: populate-content
      image: debian:stable-slim
      command: ["/bin/sh", "-c"]
      args:
        - mkdir -p /pod-data && echo "Hello from the init container" > /pod-data/index.html
      volumeMounts:
        - name: shared-data
          mountPath: /pod-data
  containers:
    - name: nginx-container
      image: nginx:stable-alpine
      ports:
        - containerPort: 80
      volumeMounts:
        - name: shared-data
          mountPath: /usr/share/nginx/html:ro
  volumes:
    - name: shared-data
      emptyDir: {}

~
~
"multi-container.yml" 27L, 651B                                    27,0-1        All
```

4. Then apply it

```
ubuntu@ip-172-31-26-39:~$ kubectl apply -f multi-container.yml
pod/two-containers created
ubuntu@ip-172-31-26-39:~$ kubectl get pods -w
```

5. Now check the pods

```
NAME             READY   STATUS    RESTARTS   AGE
two-containers   1/1     Running   0          23s

^Cubuntu@ip-172-31-26-39:~kubectl port-forward pod/two-containers 8080:8080
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
^[[A^Cubuntu@ip-172-31-26-39:~$ ^C
```