JAVA APPLICATION DEPLOYMENT IN MINIKUBE

Linux System Setup and Java Installation

sudo apt install fontconfig openjdk-17-jre

java -version

Jenkins Installation and Management

sudo service jenkins restart

sudo service jenkins status

For installation instructions: Jenkins Installation Guide

Docker Installation and Commands

sudo apt install docker.io -y

sudo service docker restart

sudo service docker status

sudo usermod -aG docker $USER

Checking Docker Images and Containers

docker images

docker ps

Fixing permission issues

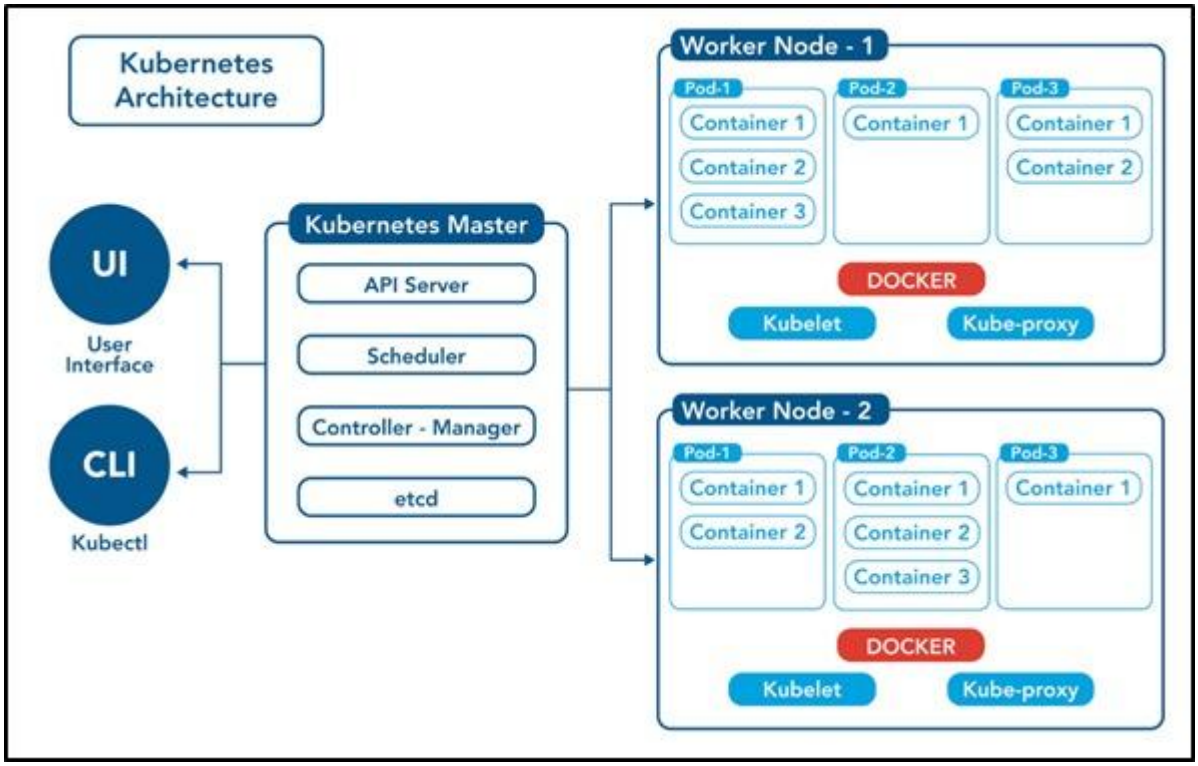
sudo chmod 666 /var/run/docker.sock

Docker Compose Installation

sudo apt install docker-compose -y

sudo curl -L "https://github.com/docker/compose/releases/latest/download/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose

---



Kubernetes (K8s) Installation and Commands

Installing kubectl

curl -LO https://dl.k8s.io/release/v1.32.0/bin/linux/amd64/kubectl

sudo install -o root -g root -m 0755 kubectl /usr/local/bin/kubectl

chmod +x kubectl

mkdir -p ~/.local/bin

mv ./kubectl ~/.local/bin/kubectl

kubectl version --client

More details: Install kubectl

Installing Minikube

curl -LO https://github.com/kubernetes/minikube/releases/latest/download/minikube-linux-amd64

sudo install minikube-linux-amd64 /usr/local/bin/minikube && rm minikube-linux-amd64

minikube start

minikube status

Kubernetes Commands

Pod Management

```
# Create a pod
kubectl run my-pod --image=nginx --port=80

# View all pods
kubectl get pods
kubectl get pods -A
kubectl get pods -n kube-system

# View pod details
describe pod <pod-name>
kubectl logs <pod-name>
kubectl exec <pod-name> -- <command>
```

YAML Configuration for a Pod

```
apiVersion: v1
kind: Pod
metadata:
  name: my-pod
  labels:
    app: my-web-app
    type: backend
spec:
  containers:
    - name: nginx-container
      image: nginx
      ports:
        - containerPort: 80
```

ReplicaSet Management

```
# Create a ReplicaSet
kubectl create -f rs-test.yml
kubectl apply -f rs-test.yml

# View ReplicaSets
kubectl get replicasets
kubectl get rs -o wide

# Scale a ReplicaSet
kubectl scale replicaset <replicaset-name> --replicas=<desired-replica-count>

# Delete a ReplicaSet
kubectl delete rs <replicaset-name>
kubectl delete -f rs-test.yml
```

ReplicaSet YAML Configuration

```
apiVersion: apps/v1
kind: ReplicaSet
metadata:
  name: my-rs
  labels:
    name: my-rs
spec:
  replicas: 4
  selector:
    matchLabels:
      apptype: web-backend
  template:
    metadata:
```

```
    labels:
      apptype: web-backend
  spec:
    containers:
    - name: my-app
      image: nginx
      ports:
        - containerPort: 8080
```

Deployment Management

```
# Create a deployment
kubectl create deployment webnginx2 --image=nginx:latest --replicas=1

# View deployments
kubectl get deployments
kubectl describe deploy <deployment-name>

# Scale a deployment
kubectl scale deploy <deployment-name> --replicas=<desired-replica-count>

# Delete a deployment
kubectl delete deploy <deployment-name>
kubectl delete -f web-deploy.yml
```

Deployment YAML Configuration

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: my-deploy
  labels:
    name: my-deploy
```

```
spec:
  replicas: 4
  selector:
    matchLabels:
      apptype: web-backend
  strategy:
    type: RollingUpdate
  template:
    metadata:
      labels:
        apptype: web-backend
    spec:
      containers:
      - name: my-app
        image: nginx
        ports:
          - containerPort: 7070
```

Service Management

```
# View services
kubectl get svc

# Create a service from YAML
kubectl create -f service.yml

# Delete a service
kubectl delete svc <service-name>
```

Service YAML Configuration

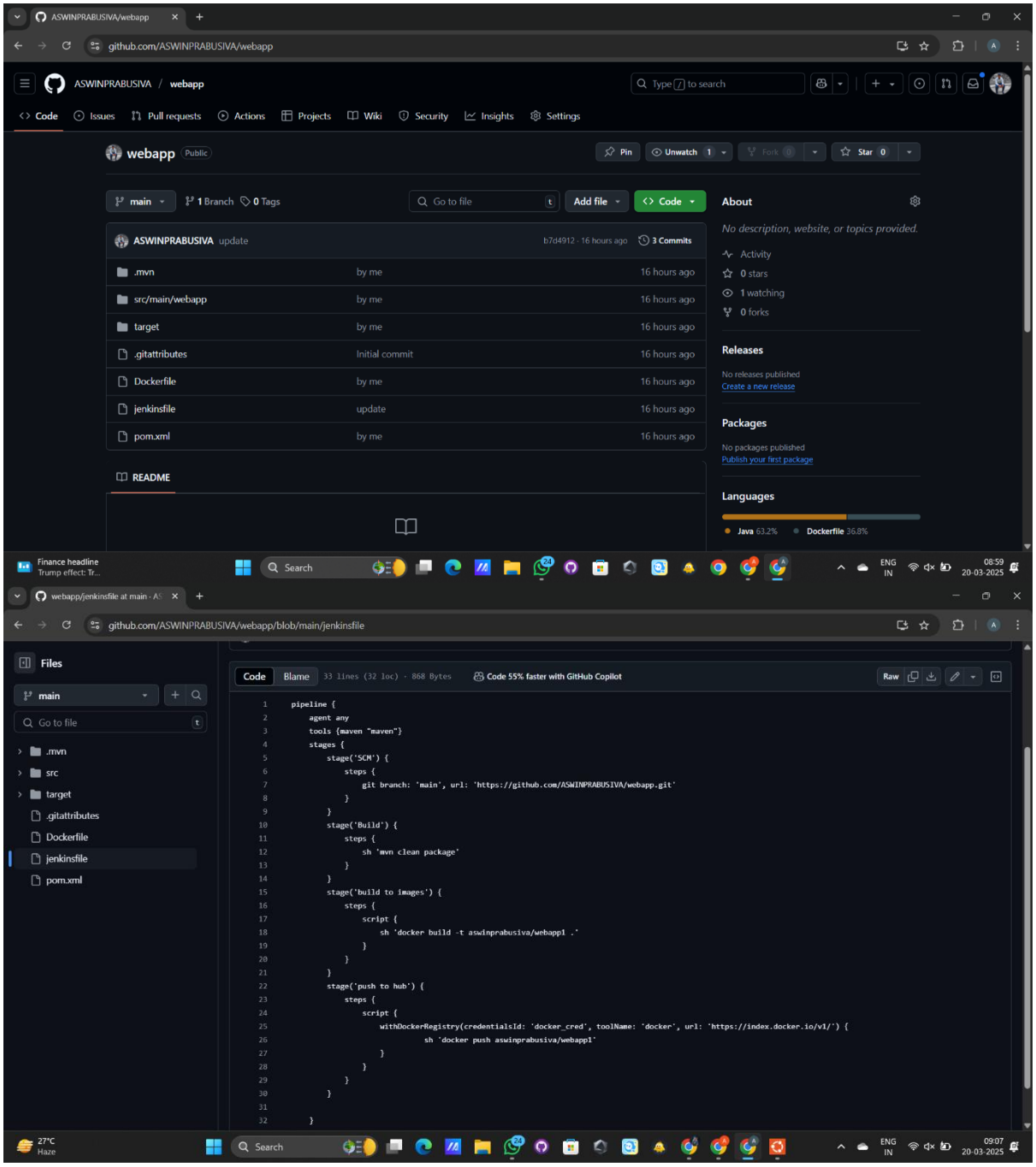
```
apiVersion: v1
kind: Service
```

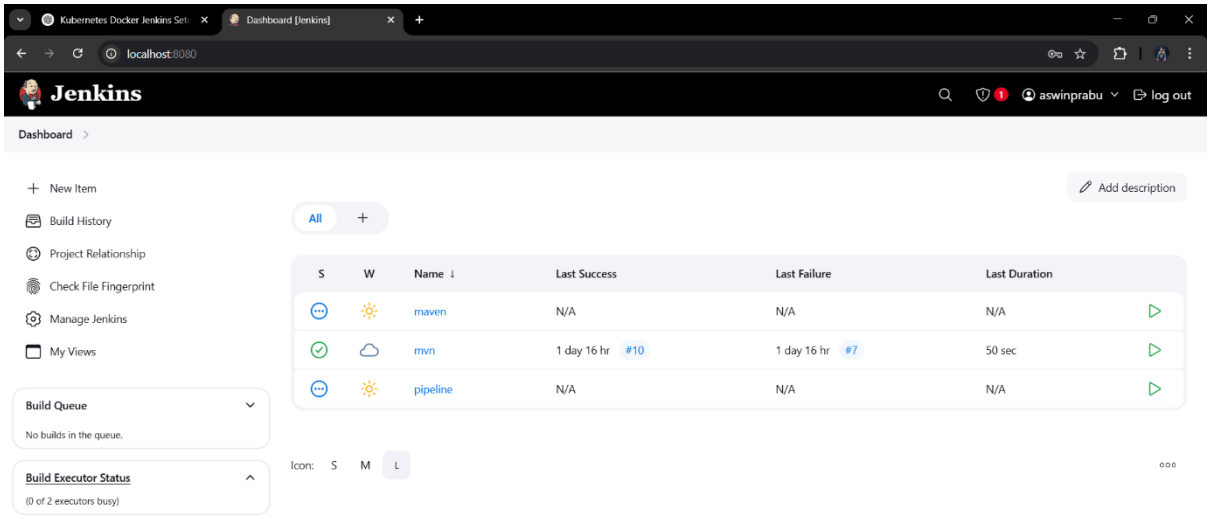
```
metadata:
  name: my-service
  labels:
    app: my-service
spec:
  type: NodePort
  ports:
    - port: 9000
      targetPort: 8080
      nodePort: 30002
  selector:
    apptype: web-backend
```

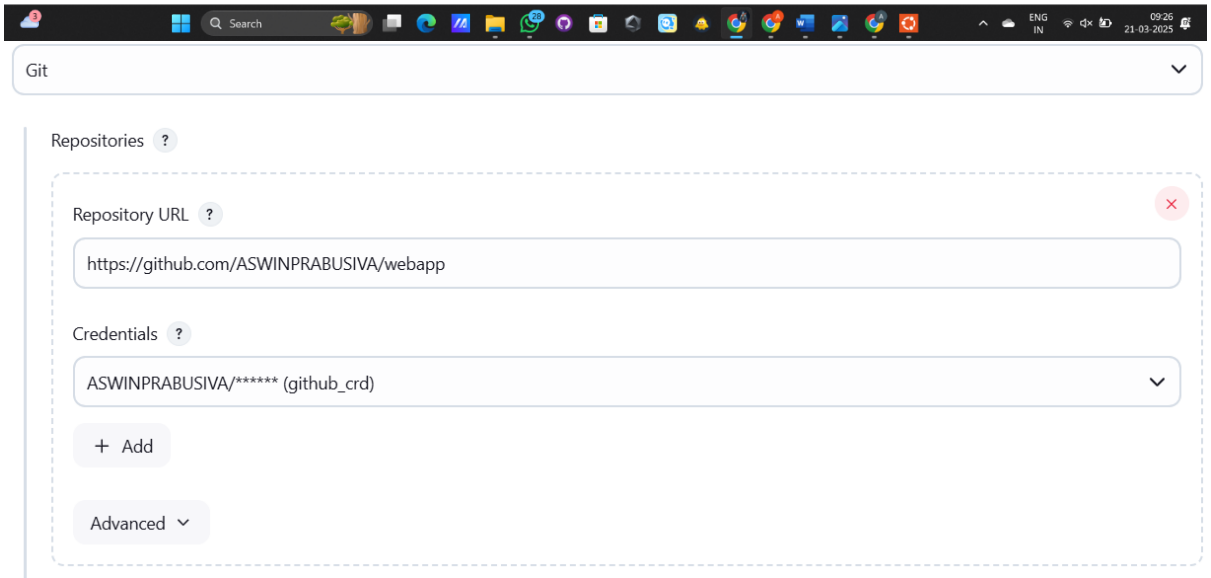
Namespace Management

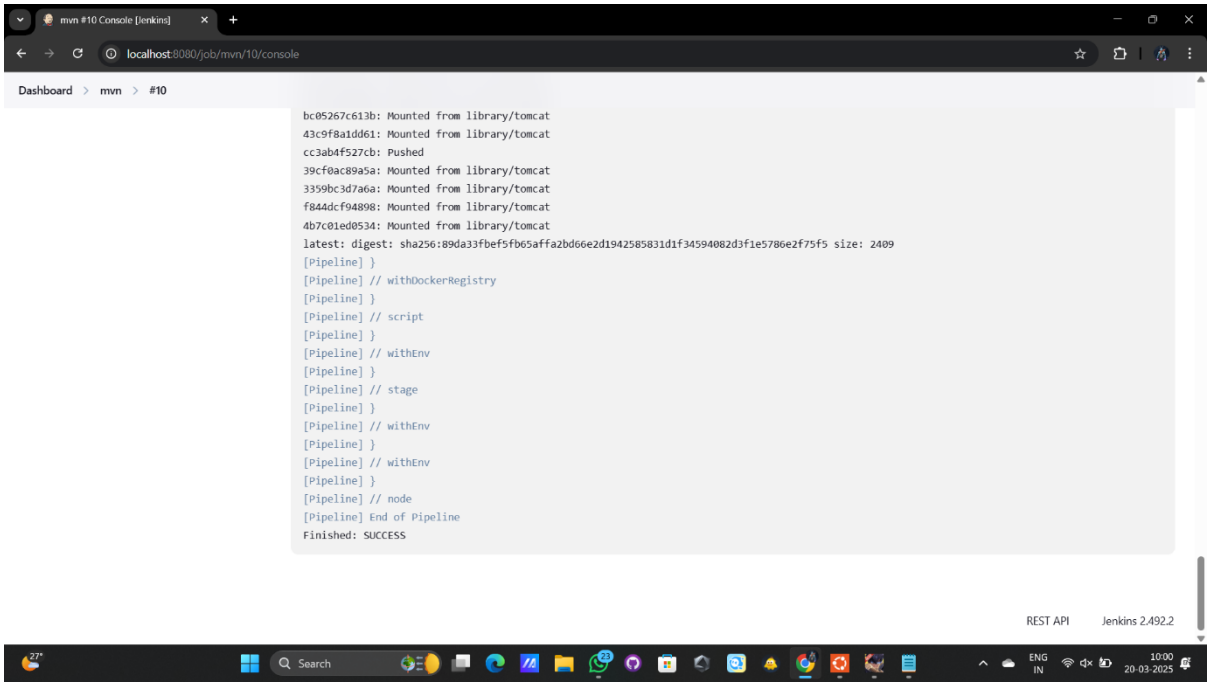
```
# Create a namespace
kubectl create namespace <namespace-name>
kubectl create ns my-bank

# View namespaces
kubectl get ns

# Switch to a namespace
kubectl config set-context --current --namespace=<namespace-name>
```

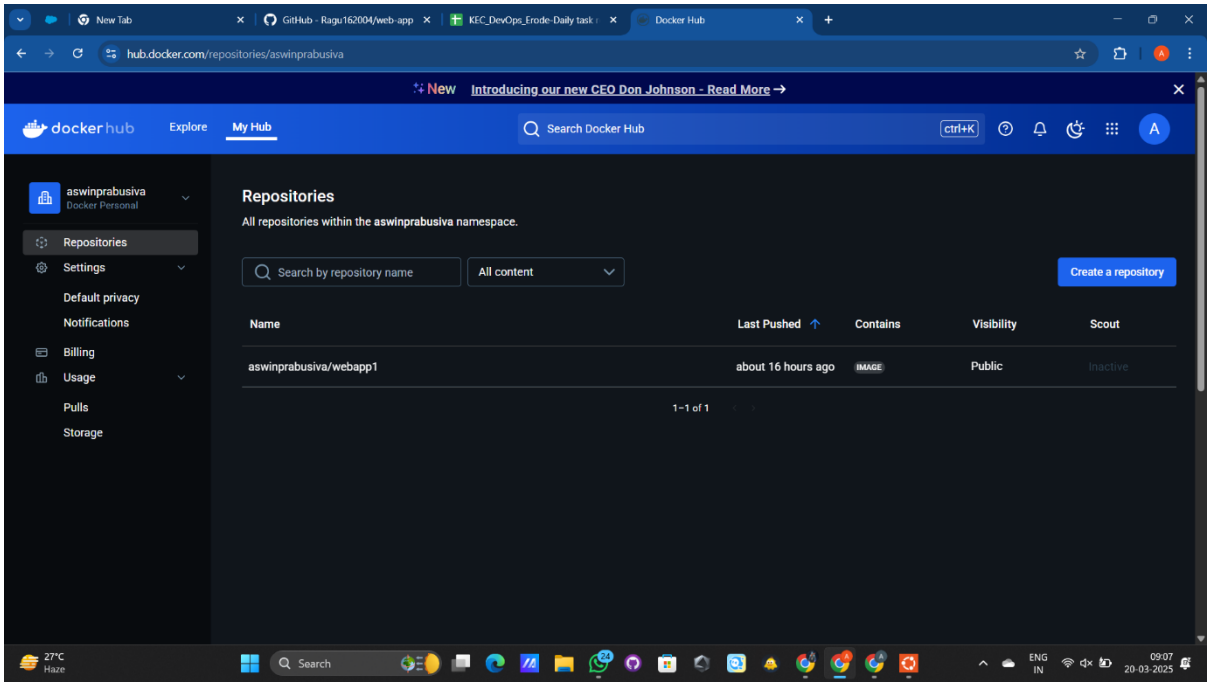
Automation using Jenkins push image from github to docker hub using jenkins automation:



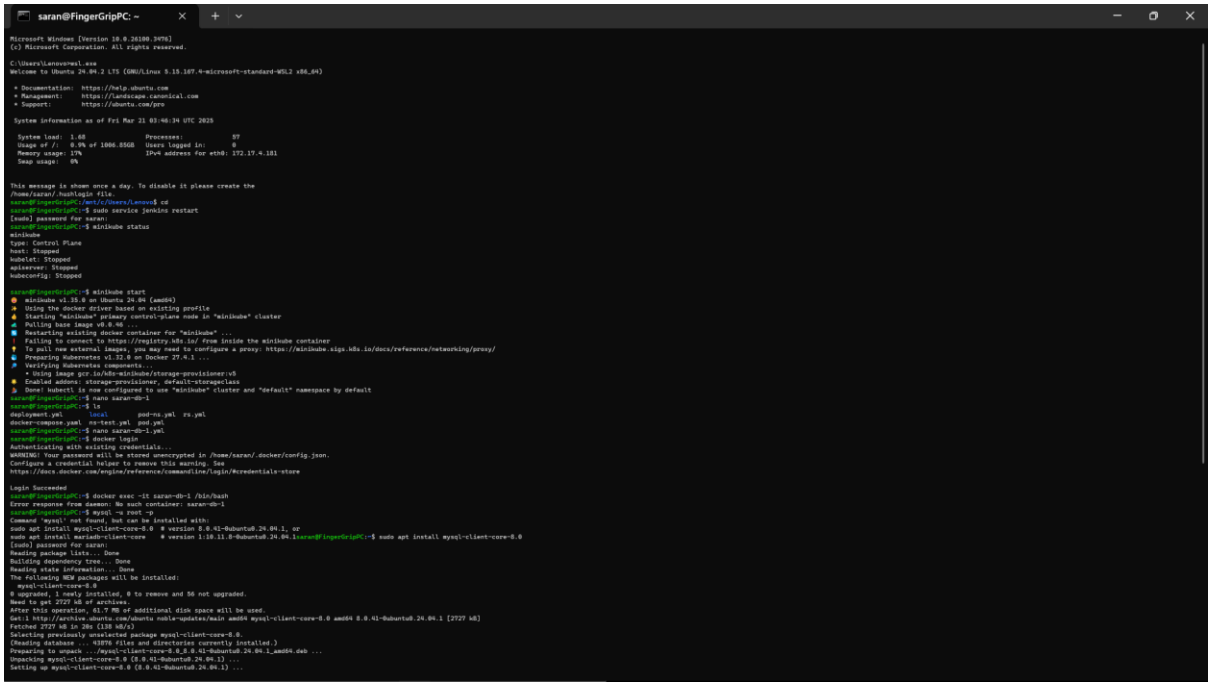

Kubernetes Docker Jenkins Set
Dashboard [Jenkins]
localhost:8080
Jenkins
aswinprabu
log out
Dashboard
New Item
Build History
Project Relationship
Check File Fingerprint
Manage Jenkins
My Views
Build Queue
No builds in the queue.
Build Executor Status
(0 of 2 executors busy)
Add description
All
S
W
Name
Last Success
Last Failure
Last Duration
maven
N/A
N/A
N/A
mvn
1 day 16 hr #10
1 day 16 hr #7
50 sec
pipeline
N/A
N/A
N/A
Icon: S M L
REST API
Jenkins 2.492.2


Search
ENG
IN
09:26
21-03-2025
Git
Repositories
Repository URL
https://github.com/ASWINPRABUSIVA/webapp
Credentials
ASWINPRABUSIVA/****** (github_crd)
Add
Advanced

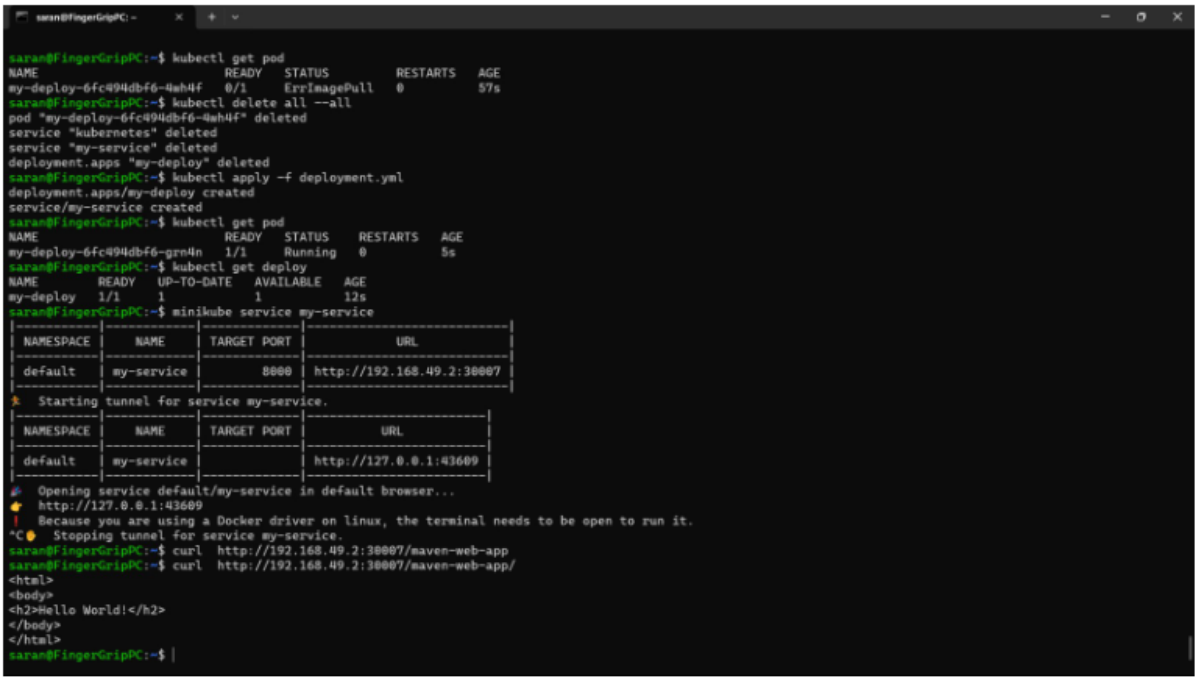

mvn #10 Console [Jenkins]
localhost:8080/job/mvn/10/console
Dashboard > mvn > #10
bc05267c613b: Mounted from library/tomcat
43c9f8a1dd61: Mounted from library/tomcat
cc3ab4f527cb: Pushed
39cf0ac89a5a: Mounted from library/tomcat
3359bc3d7a6a: Mounted from library/tomcat
f844dcf94898: Mounted from library/tomcat
4b7c01ed0534: Mounted from library/tomcat
latest: digest: sha256:89da33fbef5fb65affa2bd66e2d1942585831d1f34594082d3f1e5786e2f75f5 size: 2409
[Pipeline] }
[Pipeline] // withDockerRegistry
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
REST API
Jenkins 2.492.2
Search
ENG IN
10:00 20-03-2025

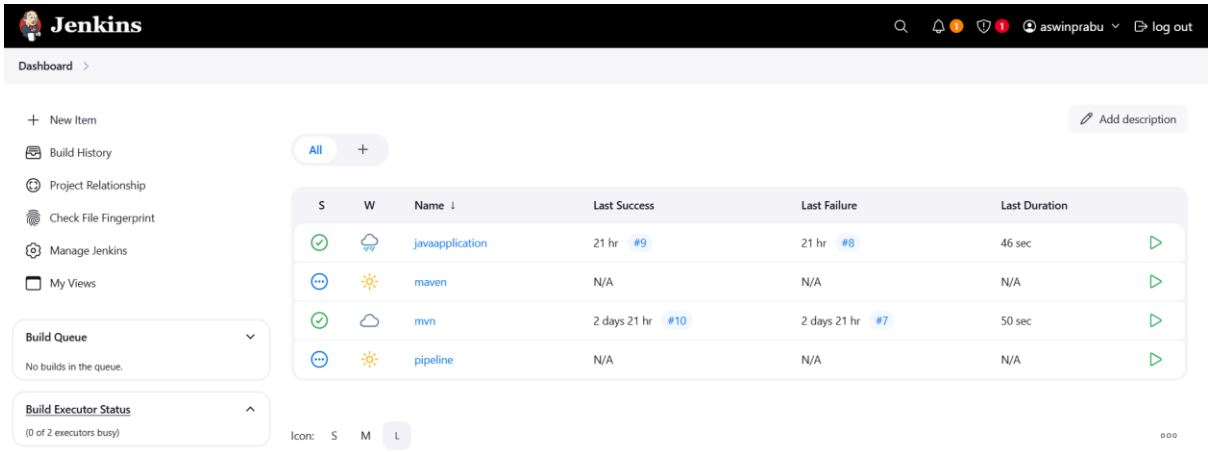

New Tab
GitHub - Ragu162004/web-app
KEC_DevOps_Erode-Daily task
Docker Hub
hub.docker.com/repositories/aswinprabusiva
New Introducing our new CEO Don Johnson - Read More
docker hub
Explore
My Hub
Search Docker Hub
ctrl+K
aswinprabusiva
Docker Personal
Repositories
Settings
Default privacy
Notifications
Billing
Usage
Pulls
Storage
Repositories
All repositories within the aswinprabusiva namespace.
Search by repository name
All content
Create a repository
Name
Last Pushed
Contains
Visibility
Scout
aswinprabusiva/webapp1
about 16 hours ago
IMAGE
Public
Inactive
1–1 of 1
27°C Haze
Search
ENG IN
09:07 20-03-2025

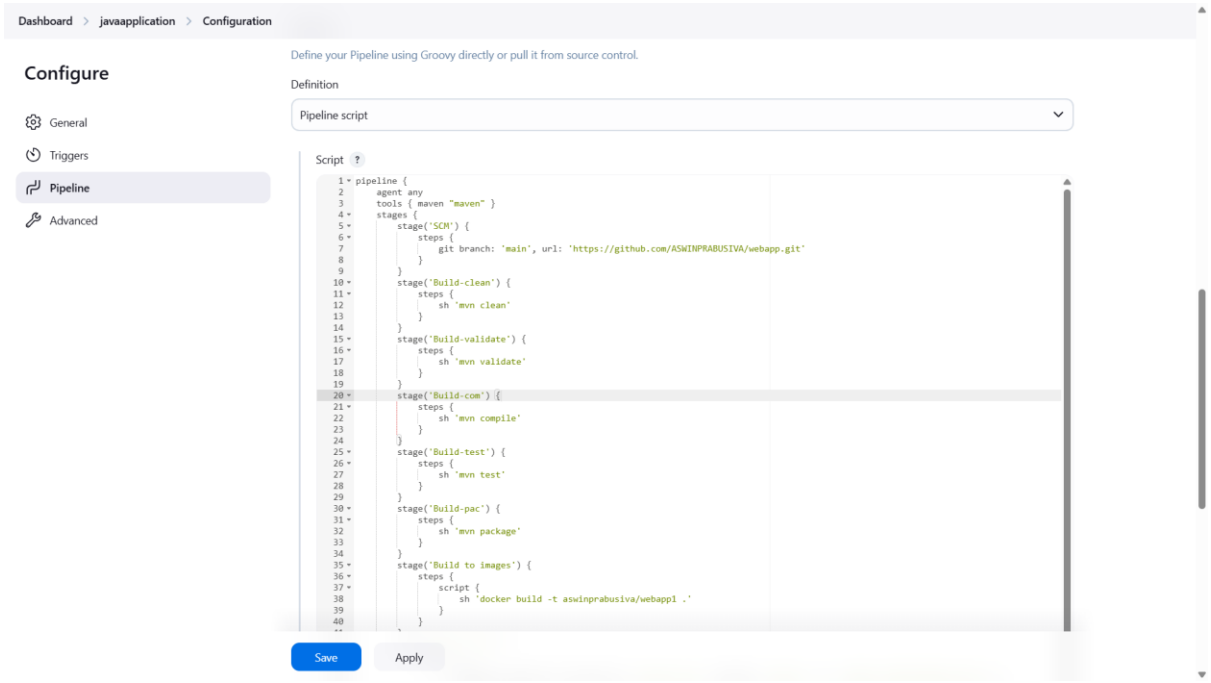
Minikube installation and mysql:

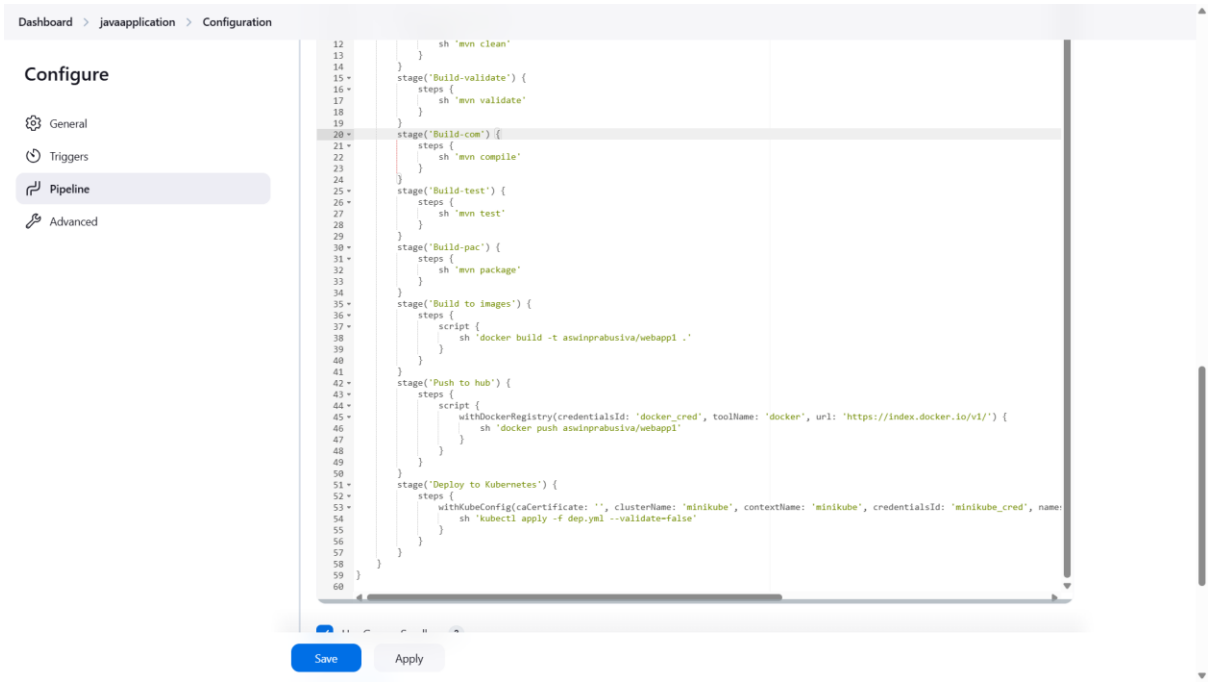


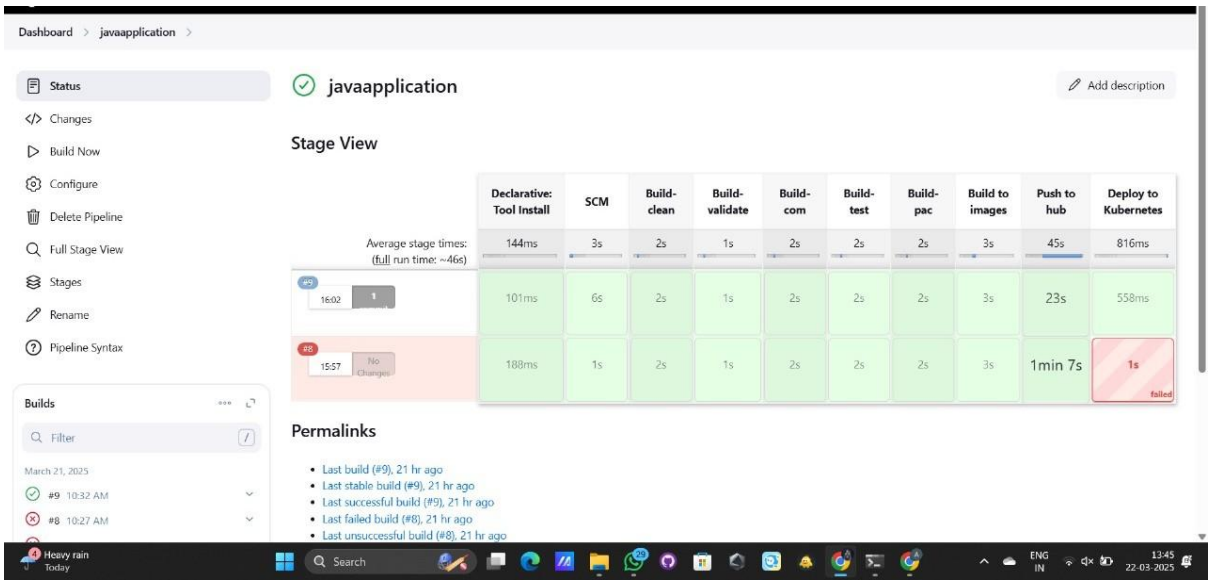
Kubernetes, Namespace:



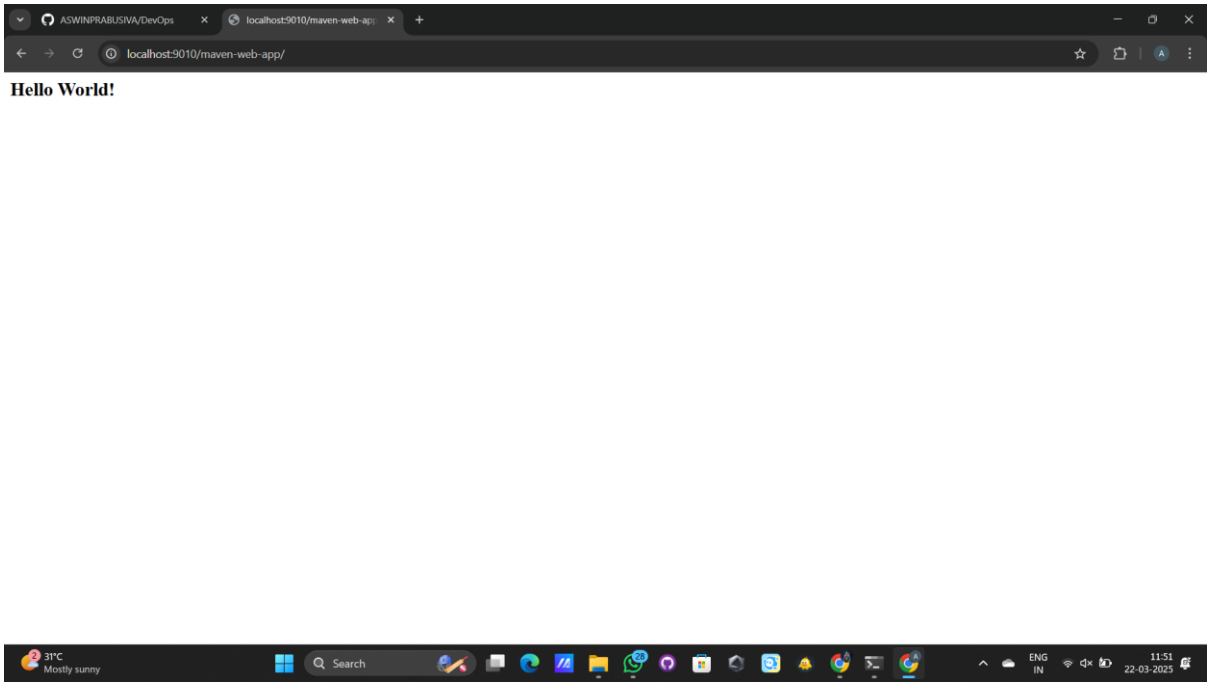

Jenkins
aswinprabu
log out
Dashboard
New Item
Build History
Project Relationship
Check File Fingerprint
Manage Jenkins
My Views
Build Queue
No builds in the queue.
Build Executor Status
(0 of 2 executors busy)
Add description
All
S
W
Name ↓
Last Success
Last Failure
Last Duration
javaapplication
21 hr #9
21 hr #8
46 sec
maven
N/A
N/A
N/A
mvn
2 days 21 hr #10
2 days 21 hr #7
50 sec
pipeline
N/A
N/A
N/A
Icon: S M L
REST API
Jenkins 2.492.2


Dashboard
javaapplication
Configuration
Configure
General
Triggers
Pipeline
Advanced
Define your Pipeline using Groovy directly or pull it from source control.
Definition
Pipeline script
Script
pipeline {
agent any
tools { maven "maven" }
stages {
stage('SCM') {
steps {
git branch: 'main', url: 'https://github.com/ASWINPRABUSIVA/webapp.git'
}
}
stage('Build-clean') {
steps {
sh 'mvn clean'
}
}
stage('Build-validate') {
steps {
sh 'mvn validate'
}
}
stage('Build-com') {
steps {
sh 'mvn compile'
}
}
stage('Build-test') {
steps {
sh 'mvn test'
}
}
stage('Build-pac') {
steps {
sh 'mvn package'
}
}
stage('Build to images') {
steps {
script {
sh 'docker build -t aswinprabusiva/webapp1 .'
}
}
Save
Apply


Dashboard > javaapplication > Configuration
Configure
General
Triggers
Pipeline
Advanced
sh 'mvn clean'
stage('Build-validate')
sh 'mvn validate'
stage('Build-com')
sh 'mvn compile'
stage('Build-test')
sh 'mvn test'
stage('Build-pac')
sh 'mvn package'
stage('Build to images')
sh 'docker build -t aswinprabusiva/webapp1 .'
stage('Push to hub')
withDockerRegistry(credentialsId: 'docker_cred', toolName: 'docker', url: 'https://index.docker.io/v1/')
sh 'docker push aswinprabusiva/webapp1'
stage('Deploy to Kubernetes')
withKubeConfig(caCertificate: '', clusterName: 'minikube', contextName: 'minikube', credentialsId: 'minikube_cred'
sh 'kubectl apply -f dep.yml --validate=false'
Save
Apply


Dashboard > javaapplication >
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Stages
Rename
Pipeline Syntax
Builds
Filter
March 21, 2025
#9 10:32 AM
#8 10:27 AM
javaapplication
Add description
Stage View
Declarative: Tool Install
SCM
Build-clean
Build-validate
Build-com
Build-test
Build-pac
Build to images
Push to hub
Deploy to Kubernetes
Average stage times:
(full run time: ~46s)
144ms
3s
2s
1s
2s
2s
2s
3s
45s
816ms
#9
16:02
101ms
6s
2s
1s
2s
2s
2s
3s
23s
558ms
#8
15:57
No Changes
188ms
1s
2s
1s
2s
2s
2s
3s
1min 7s
1s
failed
Permalinks
Last build (#9), 21 hr ago
Last stable build (#9), 21 hr ago
Last successful build (#9), 21 hr ago
Last failed build (#8), 21 hr ago
Last unsuccessful build (#8), 21 hr ago
Heavy rain
Today
Search
ENG
IN
13:45
22-03-2025

Output:


ASWINPRABUSIVA/DevOps
localhost:9010/maven-web-app/
Hello World!
31°C
Mostly sunny
Search
ENG
IN
11:51
22-03-2025