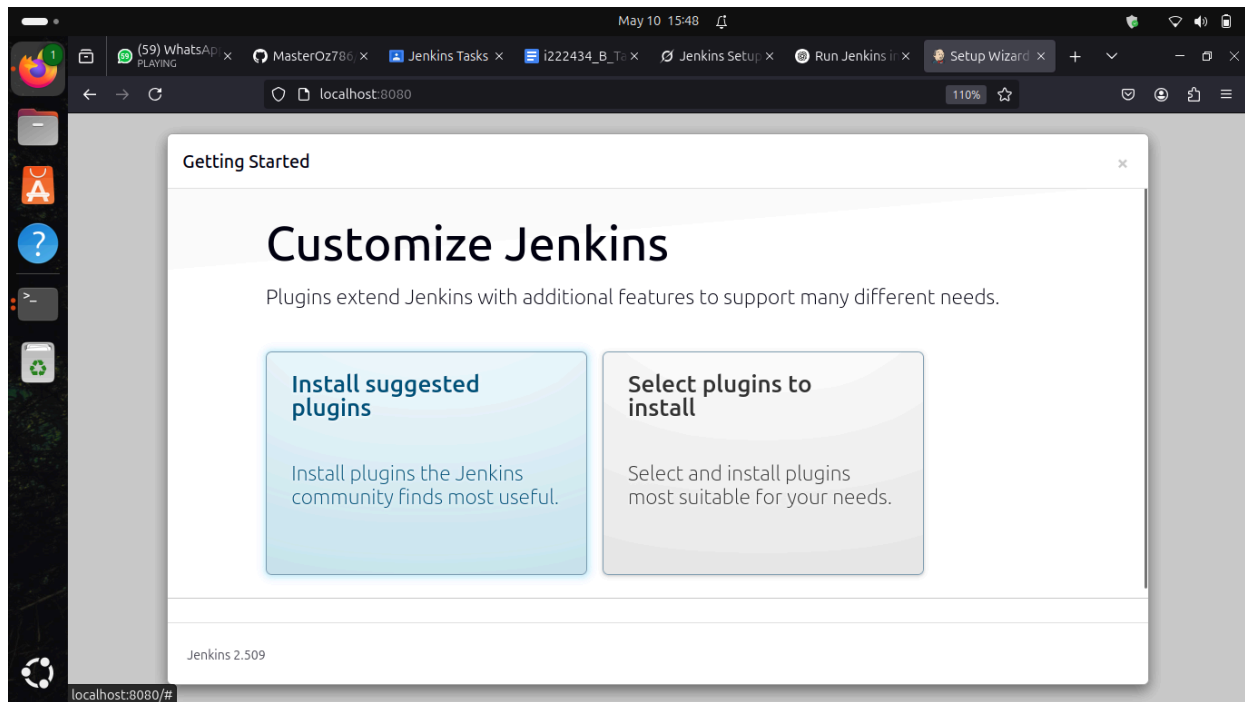
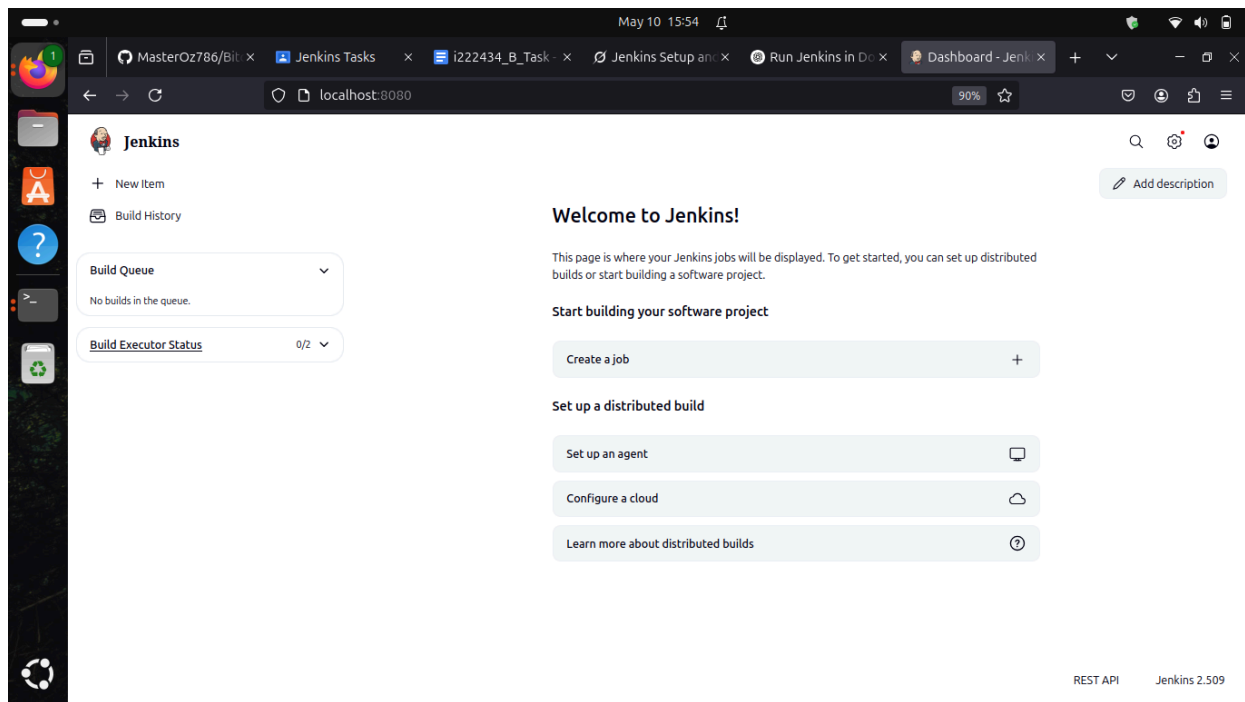
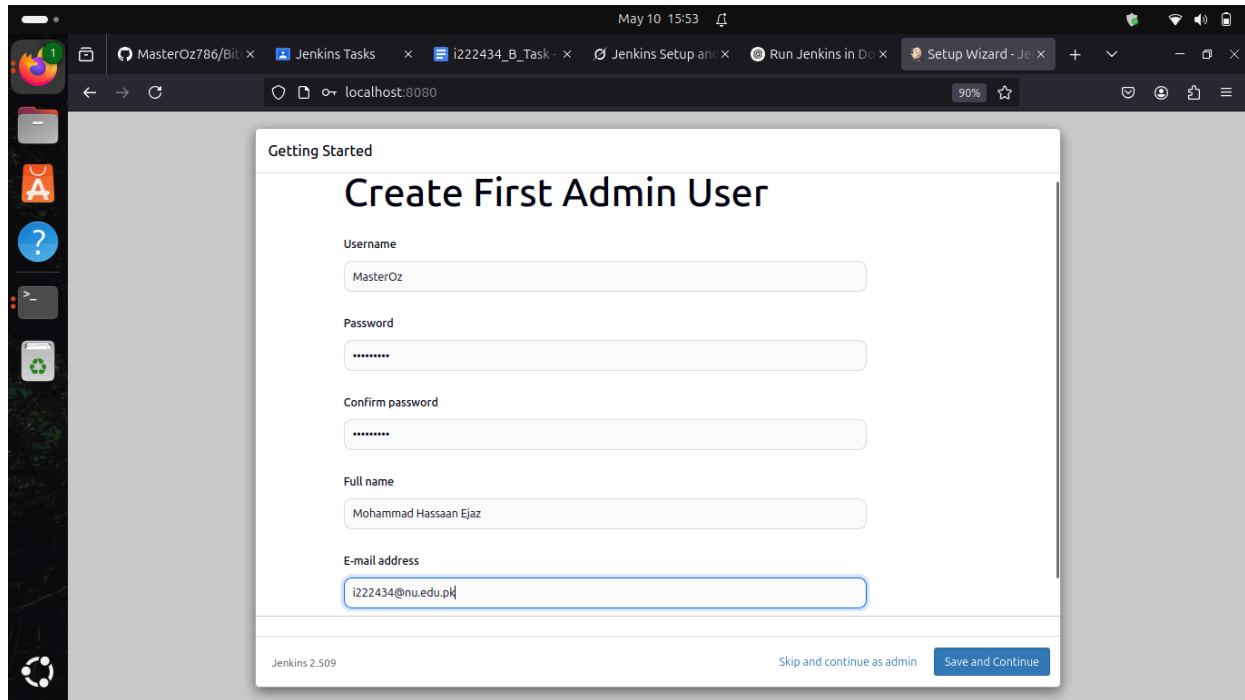


# Jenkins Tasks

## Pre-Req:

Configure and Run Jenkins: <https://www.jenkins.io/download/>



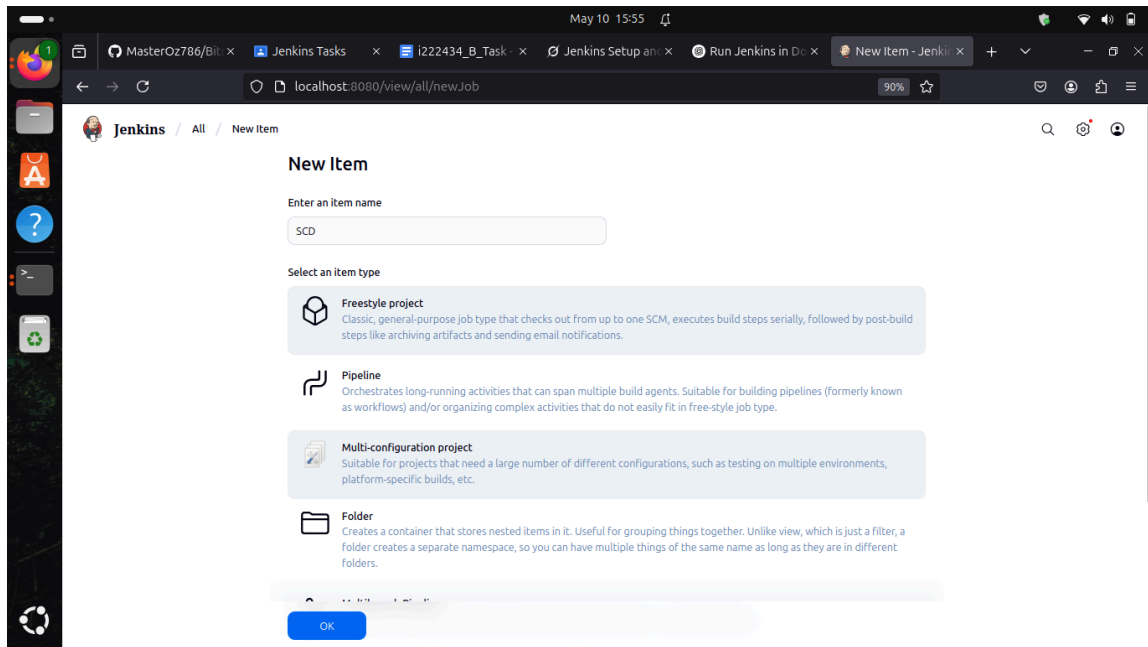


## Part 1: Basic Jenkins Tasks

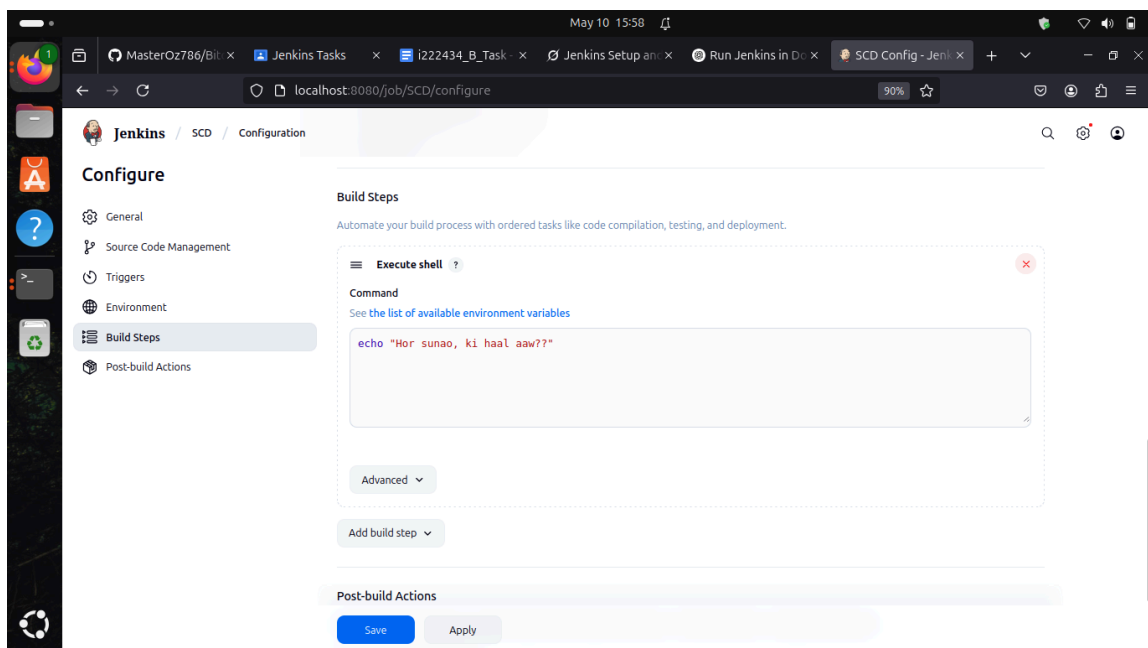
## Task 1: Create a Hello World Freestyle Project

**Goal:** Understand job configuration and basic execution

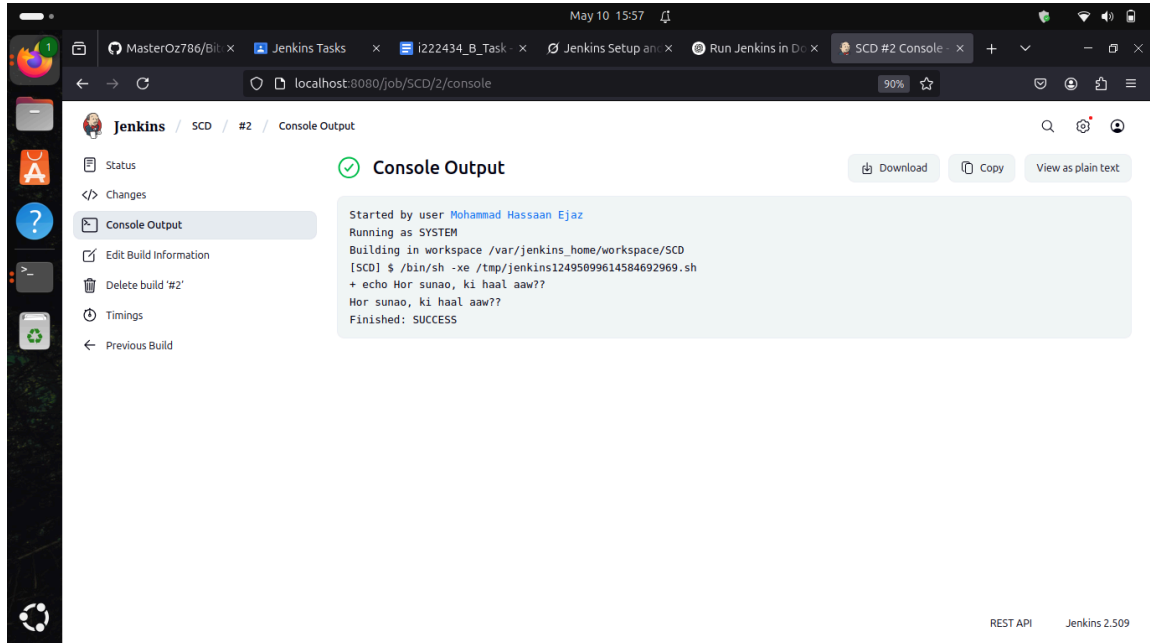
- Create a new Freestyle project



- Add a build step: `echo "Hello, Jenkins!"`



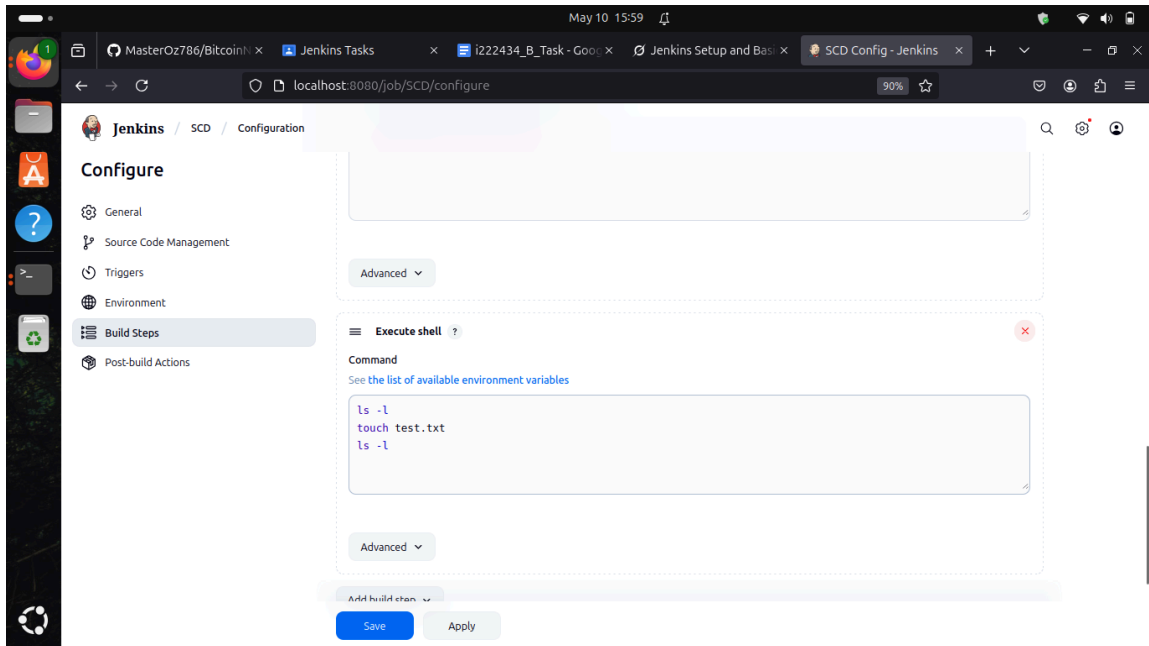
- Run the job and observe the output



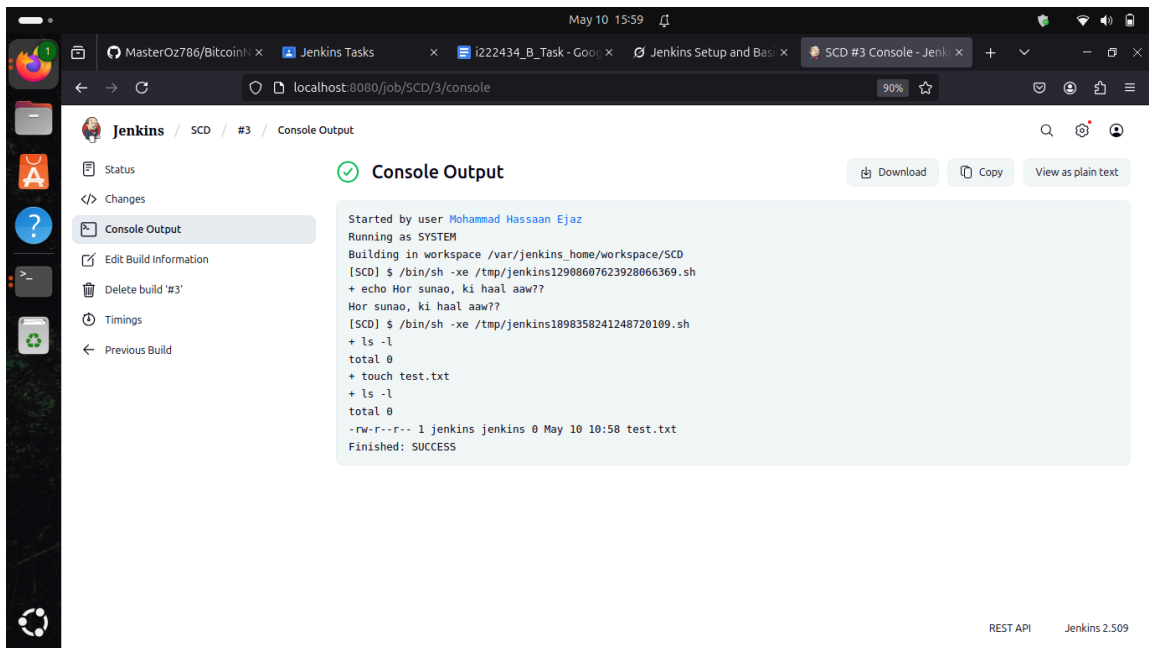
## Task 2: Run a Shell Script

**Goal:** Learn to execute shell commands

- Add a shell build step to list files: `ls -l`



- Try creating a file: `touch test.txt`

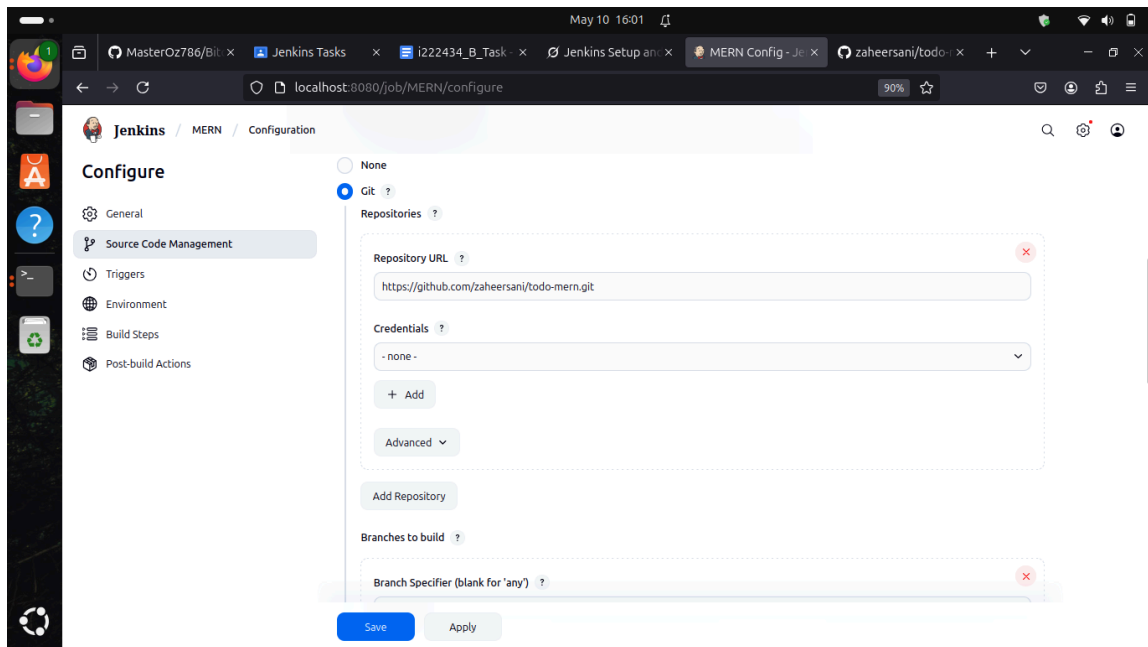


## Part 2: Pulling Code and Installing Dependencies

## Task 3: Pull MERN Stack Code (Freestyle)

**Goal:** Integrate GitHub with Jenkins

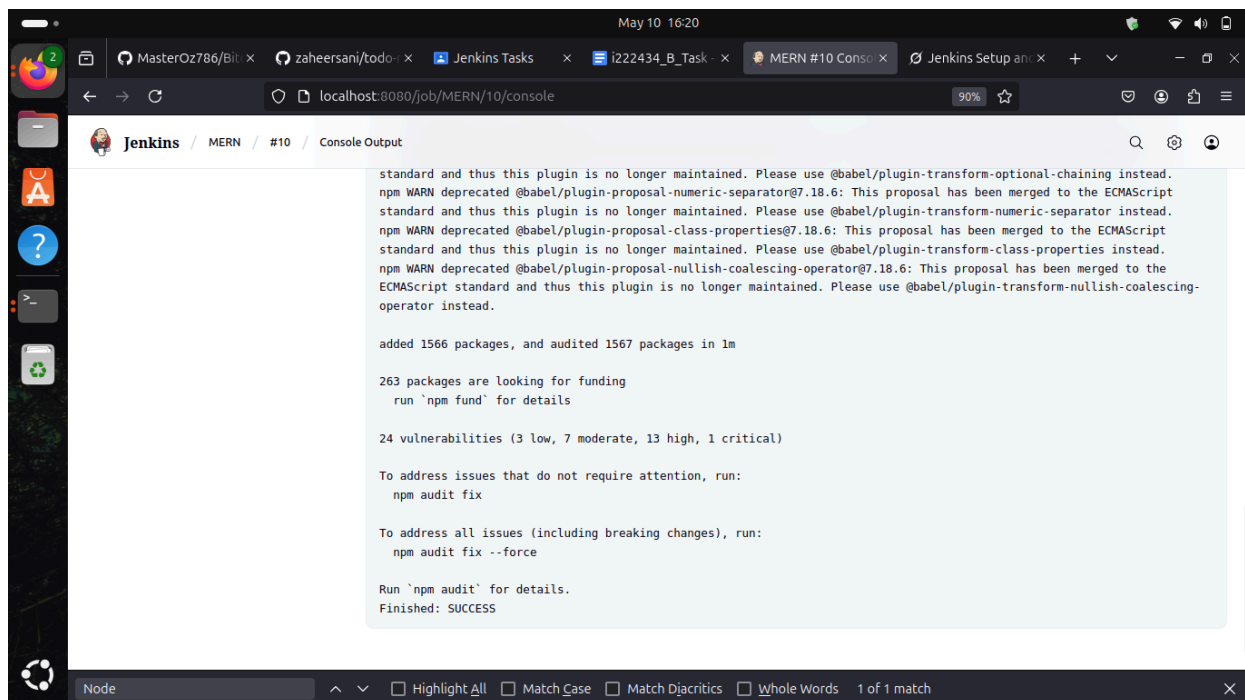
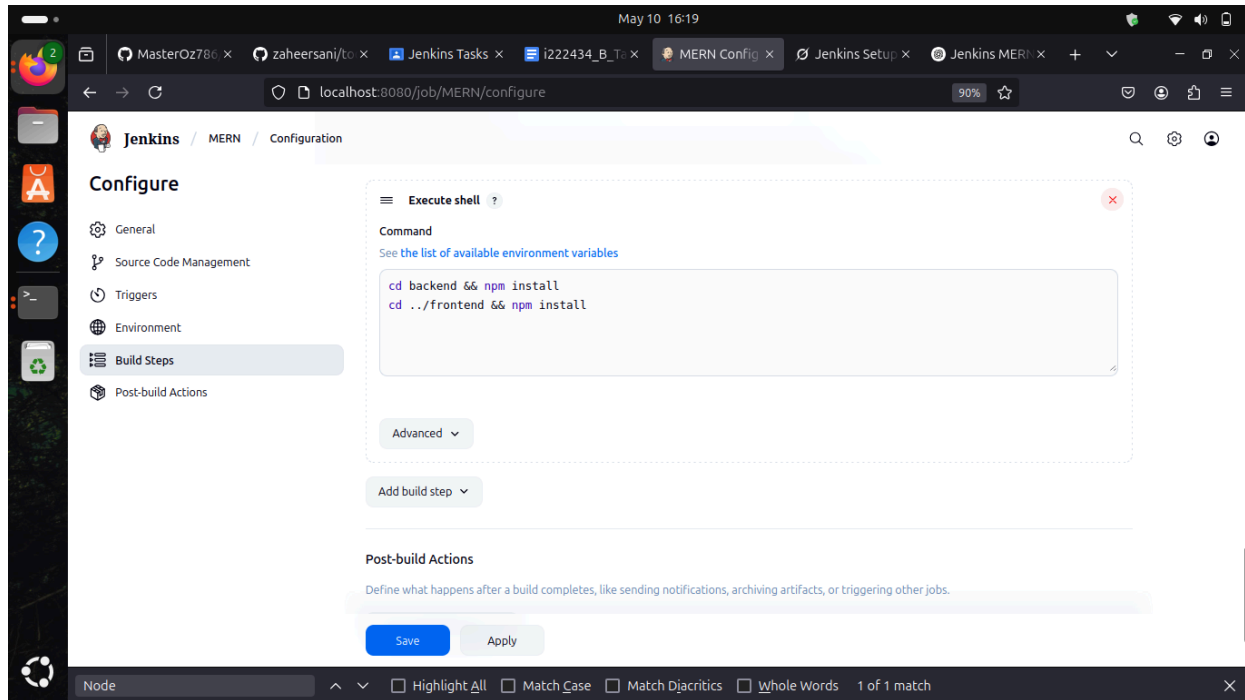
- Create a Freestyle job
- Use GitHub URL: <https://github.com/zaheersani/todo-mern.git>



- Add **Execute Shell** step:

```
cd backend && npm install
```

```
cd ../frontend && npm instal
```



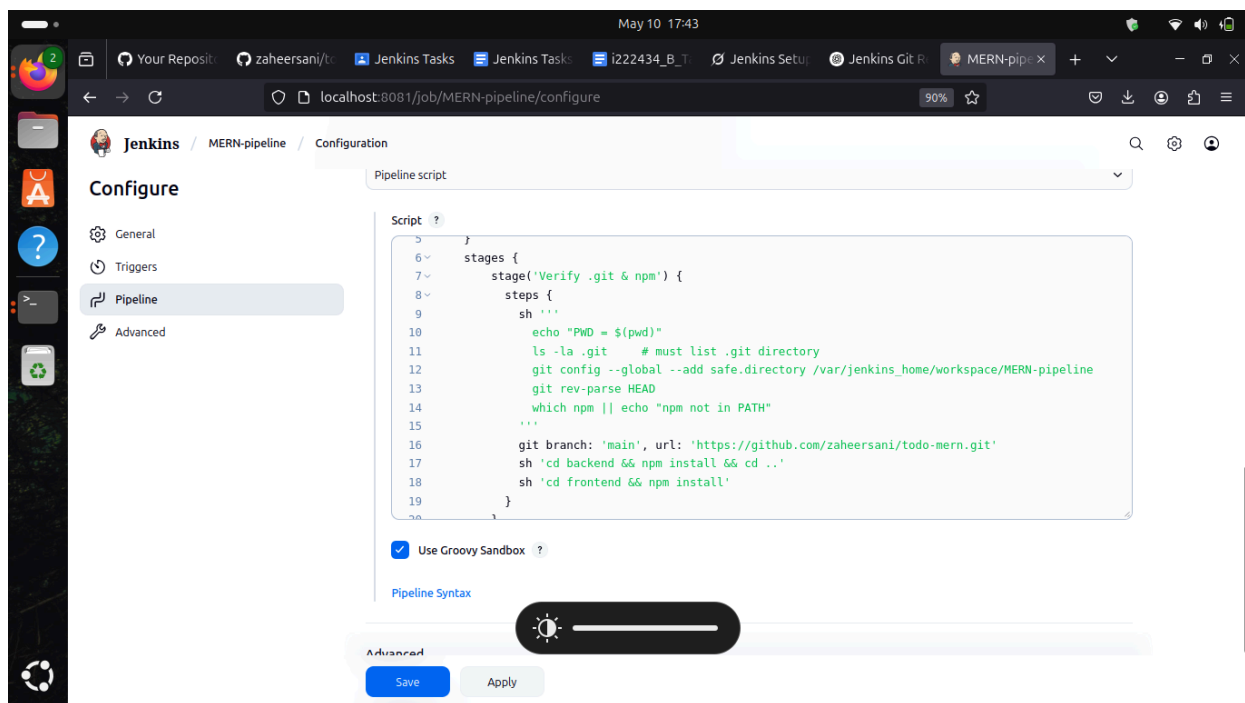
## Task 4: Switch to a Declarative Pipeline

**Goal:** Write a simple scripted build process

- Create a new **Pipeline project**

Use this basic Jenkinsfile:

```
pipeline {
  agent any
  stages {
    stage('Clone') {
      steps {
        git 'https://github.com/zaheersani/todo-mern.git'
      }
    }
  }
}
```





```
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/zaheersani/todo-mern.git # timeout=10
Fetching upstream changes from https://github.com/zaheersani/todo-mern.git
> git --version # timeout=10
> git --version # 'git version 2.39.5'
> git fetch --tags --force --progress -- https://github.com/zaheersani/todo-mern.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision aflde28439f0f0c780b68df1d0f5a10bb3a84a09 (refs/remotes/origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f aflde28439f0f0c780b68df1d0f5a10bb3a84a09 # timeout=10
> git branch -a -v --no-abbrev # timeout=10
> git branch -D main # timeout=10
> git checkout -b main aflde28439f0f0c780b68df1d0f5a10bb3a84a09 # timeout=10
Commit message: "public folder added"
> git rev-list --no-walk aflde28439f0f0c780b68df1d0f5a10bb3a84a09 # timeout=10
[Pipeline] sh
```

---

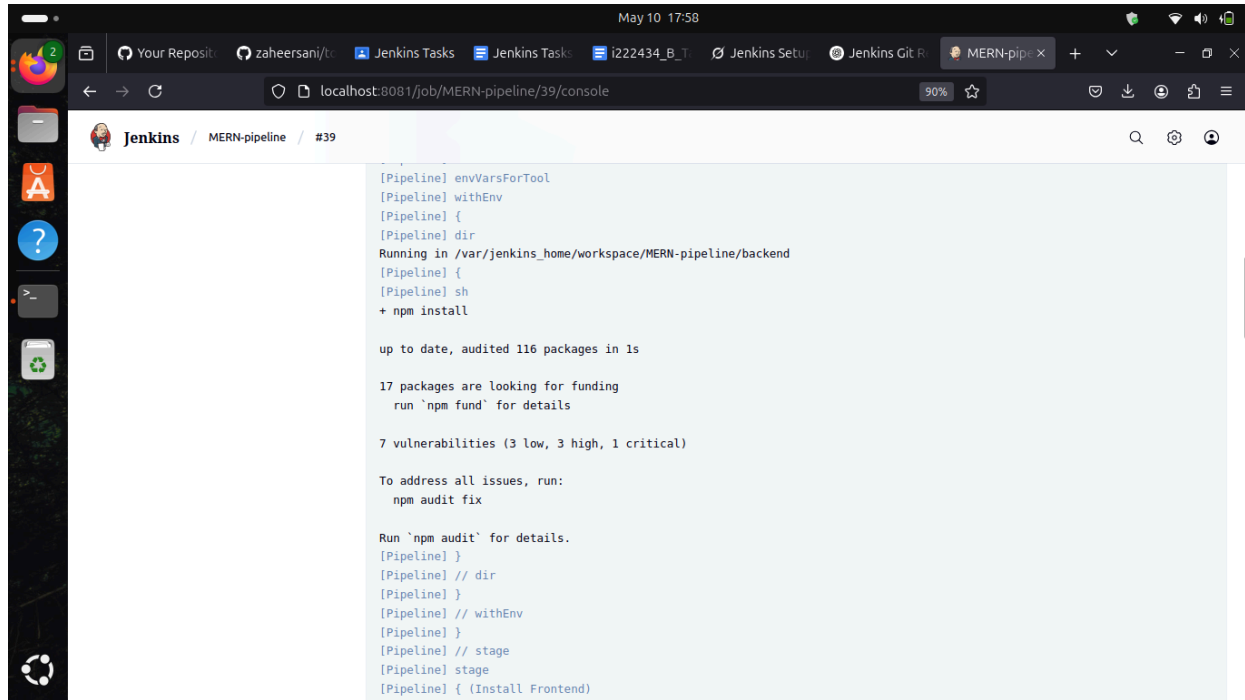
## Part 3: Building the MERN App

### Task 5: Install and Build MERN (Pipeline)

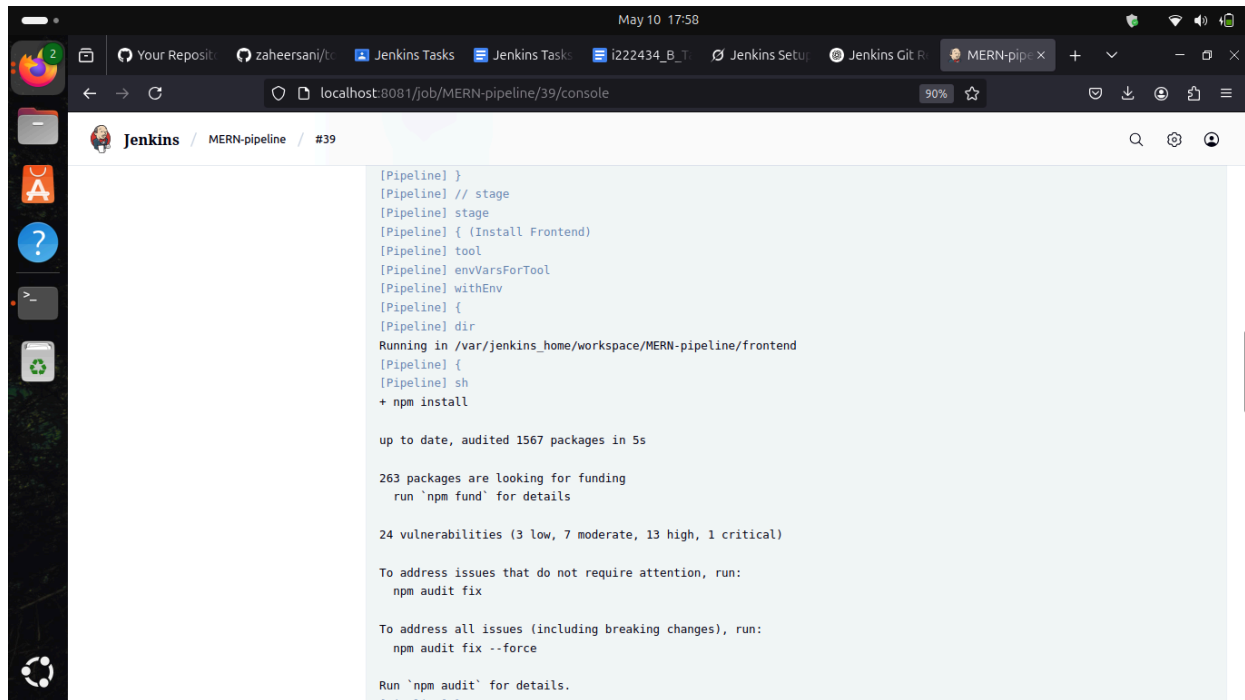
**Goal:** Run install/build steps

Extend your Je/nkinsfile:

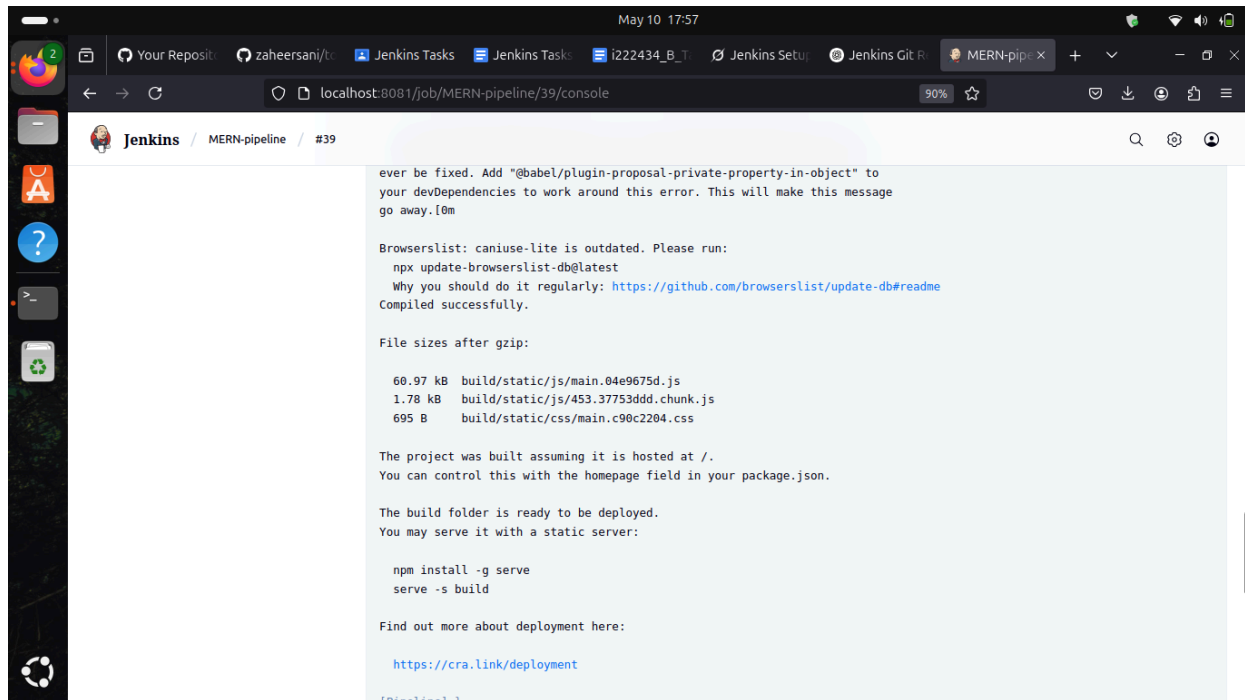
```
stage('Install Backend') {
    steps {
        dir('todo-mern/backend') {
            sh 'npm install'
        }
    }
}
```



```
stage('Install Frontend') {
  steps {
    dir('todo-mern/frontend') {
      sh 'npm install'
    }
  }
}
```



```
stage('Build Frontend') {
  steps {
    dir('todo-mern/frontend') {
      sh 'npm run build'
    }
  }
}
```



---

## Part 4: Dockerizing the MERN App

### Task 6: Write Dockerfiles for Backend & Frontend

**Goal:** Understand containerization basics

- Ask students to create:
  - `fron/Dockerfile`

```
FROM node:18
WORKDIR /app
COPY . .
RUN npm install
EXPOSE 3000
CMD ["npm", "start"]
```

- backend/Dockerfile

```
FROM node:18
WORKDIR /app
COPY . .
RUN npm install
EXPOSE 5000
CMD ["npm", "start"]
```

- 

## Task 7: Build & Push Docker Images (Pipeline)

**Goal:** Integrate Docker build and push

Extend pipeline:

```
stage('Build Docker Images') {
    steps {
        sh 'docker build -t youruser/backend:latest
todo-mern/backend'
        sh 'docker build -t youruser/frontend:latest
todo-mern/frontend'
    }
}
```

May 10 18:35

localhost:8081/job/MERN-pipeline/50/console

Jenkins / MERN-pipeline / #50

```
[Pipeline] sh
+ docker build -t masteroz/backend:latest backend
Sending build context to Docker daemon 14.55MB

Step 1/8 : FROM node:18
18: Pulling from library/node
cf05a52c0235: Already exists
63964a8518f5: Already exists
ca513cad200b: Already exists
c187b51b626e: Already exists
68b421cb119c: Already exists
bf3cd053bbe4: Already exists
e1dbe5f455cd: Already exists
a63cf41c258c: Already exists
Digest: sha256:867be01f97d45cb7d89a8ef0b328d23e8207412ebec4564441ed8cab8cc4ecd
Status: Downloaded newer image for node:18
----> e56a6e3bc572
Step 2/8 : WORKDIR /app
----> Running in c9c70f2db384
----> Removed intermediate container c9c70f2db384
----> 928510cf236b
Step 3/8 : COPY package*.json ./
----> 02e096445d2c
Step 4/8 : RUN npm install
----> Running in c31c58a26b59

added 116 packages, and audited 117 packages in 3s

18 packages are looking for funding
```

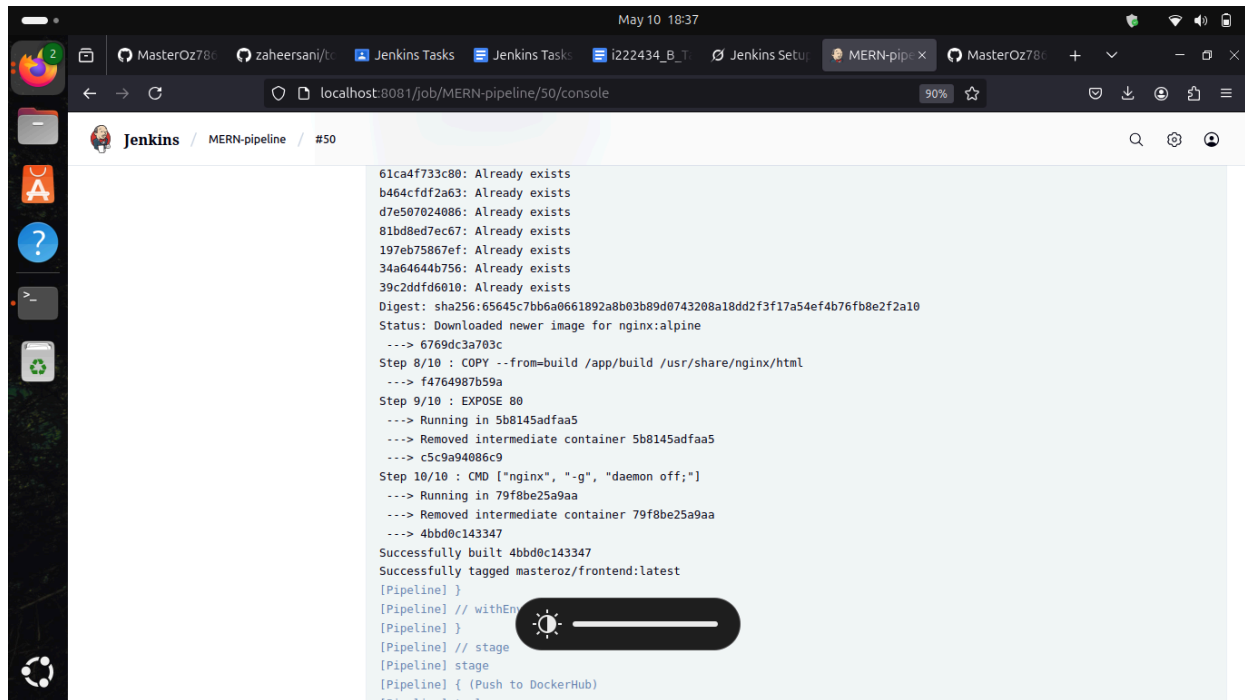
May 10 18:36

localhost:8081/job/MERN-pipeline/50/console

Jenkins / MERN-pipeline / #50

```
npm notice Changelog: https://github.com/npm/cli/releases/tag/v11.3.0
npm notice To update run: npm install -g npm@11.3.0
npm notice
[0m ----> Removed intermediate container c31c58a26b59
----> 1c5c405700a2
Step 5/8 : COPY . .
----> e151191d2cea
Step 6/8 : ENV NODE_ENV=production
----> Running in c5aaf3ac1743
----> Removed intermediate container c5aaf3ac1743
----> 38cafd1f838f
Step 7/8 : EXPOSE 5000
----> Running in 1b61f79c304b
----> Removed intermediate container 1b61f79c304b
----> 0e0b2c1b4c23
Step 8/8 : CMD ["npm", "start"]
----> Running in 2a75a06cb37c
----> Removed intermediate container 2a75a06cb37c
----> fe5a93e2c1f0
Successfully built fe5a93e2c1f0
Successfully tagged masteroz/backend:latest
[Pipeline] sh
+ docker build -t masteroz/frontend:latest frontend
Sending build context to Docker daemon 415.6MB

Step 1/10 : FROM node:18 as build
----> e56a6e3bc572
Step 2/10 : WORKDIR /app
----> Using cache
```



```

stage('Push to DockerHub') {
    steps {
        withCredentials([usernamePassword(credentialsId:
'docker-hub-creds', usernameVariable: 'USER', passwordVariable:
'PASS')) {
            sh '''
                echo $PASS | docker login -u $USER --password-stdin
                docker push youruser/backend:latest
                docker push youruser/frontend:latest
            '''
        }
    }
}

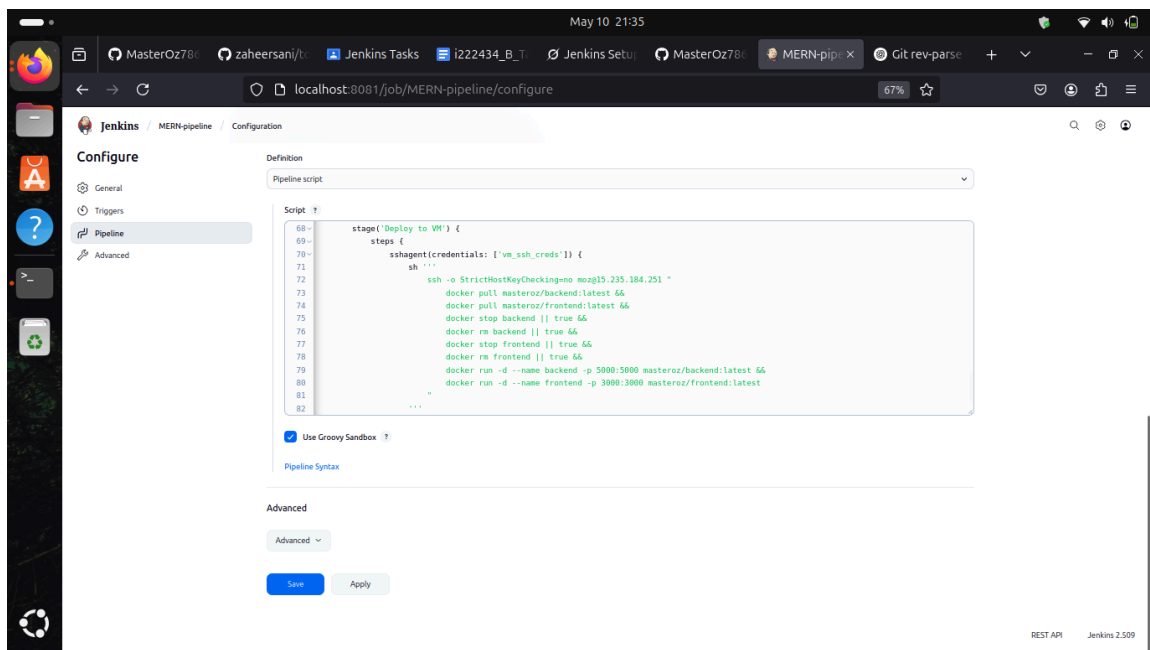
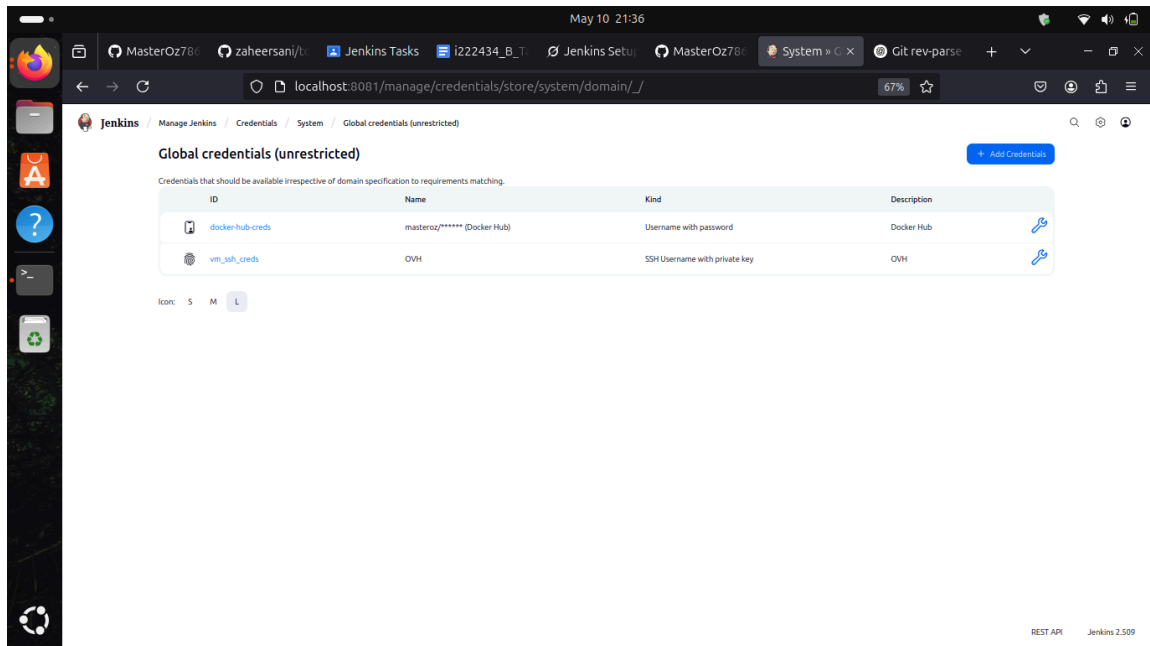
```

## Part 5: Deploy to Server (That can be local VM)

### Task 8: SSH and Deploy Containers

**Goal:** Learn basic deployment to VM

- Use **sshagent** with server credentials



- Pull and run Docker images remotely



May 10 21:34

MasterOz786 zaheersani/t Jenkins Tasks i222434\_B\_T Jenkins Setu MasterOz786 MERN-pip: X Git rev-parse + - - X

localhost:8081/job/MERN-pipeline/59/console 90% ☆

Jenkins / MERN-pipeline / #59

```
docker.io/masteroz/frontend:latest
Error response from daemon: No such container: backend
Error response from daemon: No such container: backend
Error response from daemon: No such container: frontend
Error response from daemon: No such container: frontend
248e767d9b810a2b3231a8a447cc68ea168036d0f58262bcc52a0641b02e9378
9a0db8e4c8e384283e2fce50bb93c6b394851df0ae589398970e27189070a0b0
[Pipeline] }
$ ssh-agent -k
unset SSH_AUTH_SOCK;
unset SSH_AGENT_PID;
echo Agent pid 299 killed;
[ssh-agent] Stopped.
[Pipeline] // sshagent
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

REST API Jenkins 2.509

May 10 21:38

moz@vps-390bb1e9: ~

Run 'docker image COMMAND --help' for more information on a command.

```
moz@vps-390bb1e9:~$ docker image ls
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
masteroz/frontend   latest      4bbd0c143347  3 hours ago   50.9MB
masteroz/backend     latest      fe5a93e2c1f0  3 hours ago   1.12GB
postgres            17         4e86ce23c73b  47 hours ago  438MB
```

```
moz@vps-390bb1e9:~$ docker ps
CONTAINER ID   IMAGE          NAMES      COMMAND                  CREATED        STATUS        PORTS
9a0db8e4c8e3   masteroz/frontend:latest   "/docker-entrypoint...."  3 minutes ago  Up 3 minutes  80/tcp, 0.0.0.0:30
00->3000/tcp, :::3000->3000/tcp   frontend
248e767d9b81   masteroz/backend:latest    "docker-entrypoint.s..."  3 minutes ago  Up 3 minutes  0.0.0.0:5000->5000
/tcp, :::5000->5000/tcp          backend
83eb2561ca68   postgres:17      "docker-entrypoint.s..."  22 hours ago   Up 22 hours   5432/tcp
pg17-container
```

```
moz@vps-390bb1e9:~$ ip a | grep inet
inet 127.0.0.1/8 scope host lo
inet6 ::1/128 scope host noprefixroute
inet 15.235.184.251/32 metric 100 scope global dynamic ens3
inet6 2402:1f00:8000:800::18a/56 scope global
inet6 fe80::f816:3eff:fe2b:4f6d/64 scope link
inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
inet6 fe80::42:5dff:fedb:d53c/64 scope link
inet 172.19.0.1/16 brd 172.19.255.255 scope global br-dbf769d6a5aa
inet6 fe80::42:95ff:fedc:18da/64 scope link
inet6 fe80::4c48:9eff:fe3d:f8aa/64 scope link
inet6 fe80::6cd5:93ff:fe31:24c/64 scope link
inet6 fe80::49a:c7ff:fec2:bd4a/64 scope link
```

```
moz@vps-390bb1e9:~$ ip a | grep inet
```