Task 6: Jenkins Pipeline – Docker Build and Push to Docker Hub

1. Objective:-

The objective of this task is to create a **Jenkins Declarative Pipeline** that:

1. Pulls the latest code from GitHub.
2. Builds a Docker image from the application code.
3. Pushes the Docker image to Docker Hub under the repository shafith04/jenkins-demo.

2. Purpose

- To implement **Continuous Integration and Continuous Deployment (CI/CD)**.
- To avoid manual steps of building and pushing Docker images.
- To ensure that **any code change** triggers an automatic pipeline, reducing errors and saving time.
- To demonstrate **Jenkins pipeline skills** with Docker and GitHub integration.

3. Tools Used:-

Tool	Purpose
Jenkins	Automates pipeline (CI/CD)
GitHub	Version control and source code repository
GitHub	Containerization of the application
Ubuntu	Server environment for Jenkins and Docker

4. Project Steps

Step 1: Create GitHub Repository

- Created repository: jenkins-docker-pipeline
- Added project files:
    - app.js (Node.js sample app)
    - package.json
    - Dockerfile
    - Jenkinsfile

Step 2: Write Application Code:

```javascript
// app.js
console.log("Hello from Jenkins Docker Pipeline!");
```

- Initialized Node.js project using npm init -y.
- Verified app runs locally:

```bash
node app.js
```

Output:

```csharp
Hello from Jenkins Docker Pipeline!
```

Step 3: Create Dockerfile:-

```
dockerfile

FROM node:18-alpine
WORKDIR /app
COPY package*.json ./
RUN npm install --only=production
COPY . .
CMD ["node", "app.js"]
```

Step 4: Build Docker Image Locally:-

```
bash

docker build -t shafith04/jenkins-demo .
docker run shafith04/jenkins-demo
```

Step 5: Push Docker Image to Docker Hub:-

```
bash

docker login -u shafith04
docker push shafith04/jenkins-demo
```

- Image is now available at: Docker Hub.

Step 6: Create Jenkins Pipeline:-

- Jenkinsfile added to project:

```
groovy

pipeline {
    agent any

    environment {
        DOCKER_HUB_USER = 'shafith04'
        IMAGE_NAME = 'jenkins-demo'
    }

    stages {
        stage('Checkout Code') {
            steps {
                git branch: 'main', url: 'https://github.com/mohamedshafith04/jenkins-docker-
pipeline.git'
            }
        }

        stage('Build Docker Image') {
            steps {
                sh 'docker build -t $DOCKER_HUB_USER/$IMAGE_NAME .'
            }
        }

        stage('Login to Docker Hub') {
            steps {
                withCredentials([string(credentialsId: 'dockerhub-pass', variable:
'DOCKERHUB_PASS')]) {
                    sh 'echo $DOCKERHUB_PASS | docker login -u $DOCKER_HUB_USER --password-
stdin'
```

```
            }
        }
    }

    stage('Push Docker Image') {
        steps {
            sh 'docker push $DOCKER_HUB_USER/$IMAGE_NAME'
        }
    }
}

post {
    success {
        echo '✅ Docker image built and pushed successfully!'
    }
    failure {
        echo '❌ Pipeline failed!'
    }
}
}
```

- Configured Jenkins job: Pipeline → SCM → GitHub repository.

Step 7: Run Jenkins Pipeline:-

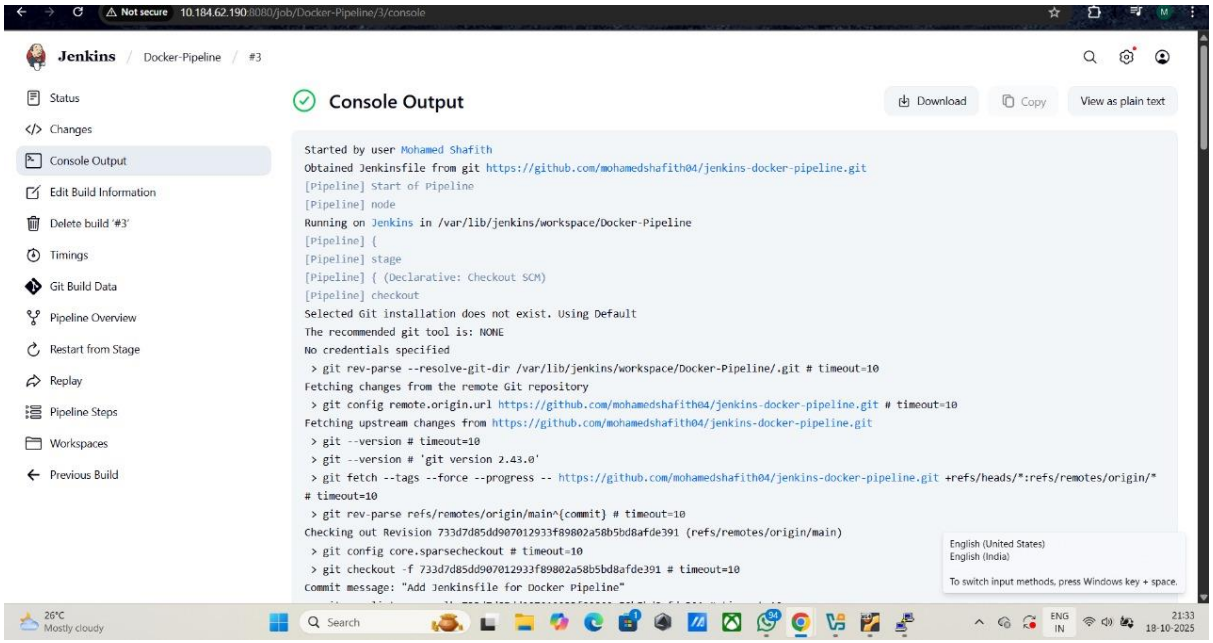
- Pipeline successfully ran:
    - Pulled latest code from GitHub
    - Built Docker image
    - Logged in to Docker Hub
    - Pushed image to Docker Hub
- Console output showed:

```
arduino

✅ Docker image built and pushed successfully!
```

5. Screenshots (Placeholders):-

1. **Jenkins Dashboard with Pipeline Job**
   (Insert screenshot of Docker-Pipeline job)



2. **Pipeline Console Output**:-

(Insert screenshot showing stages successful: Checkout → Build → Push)

Fig:(1)

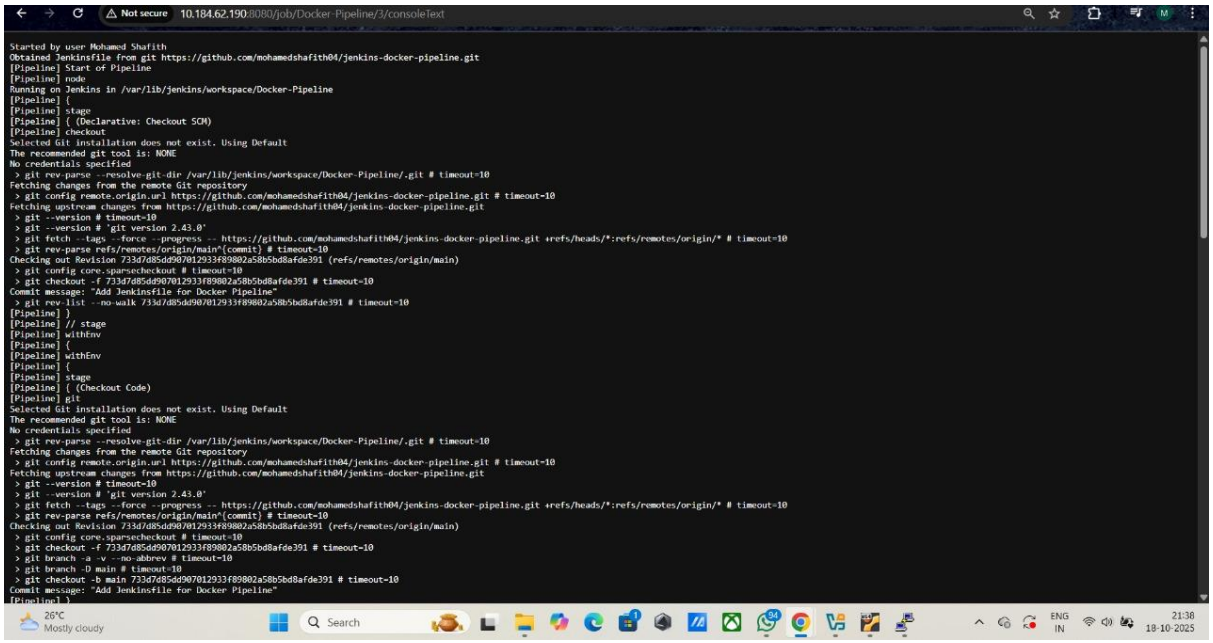
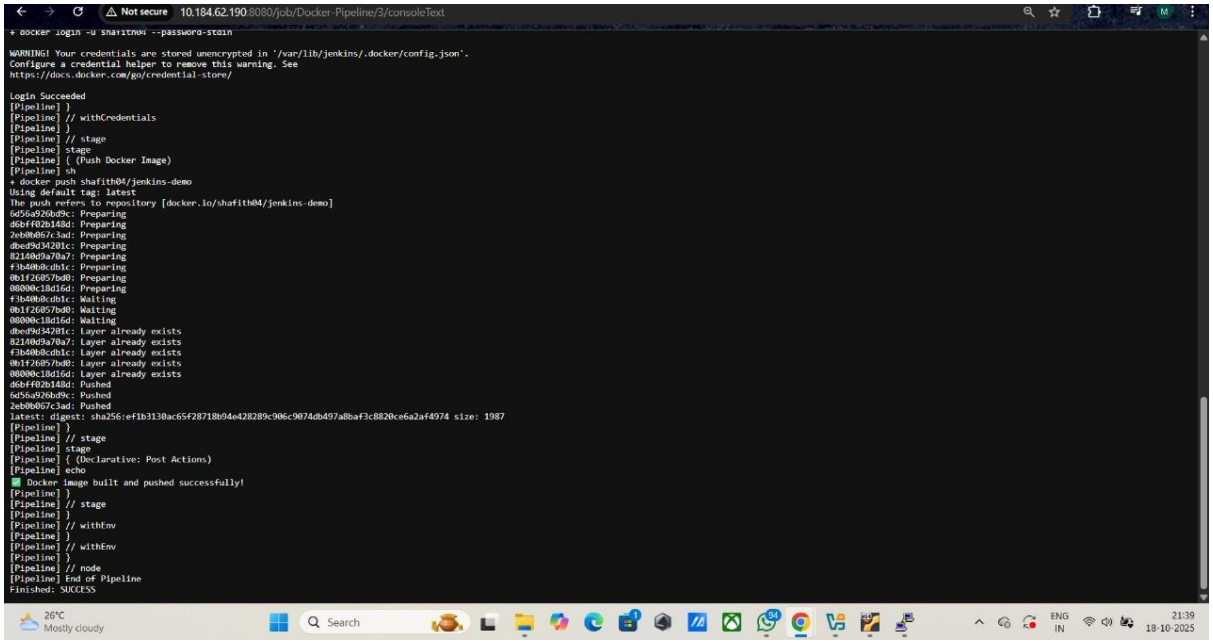
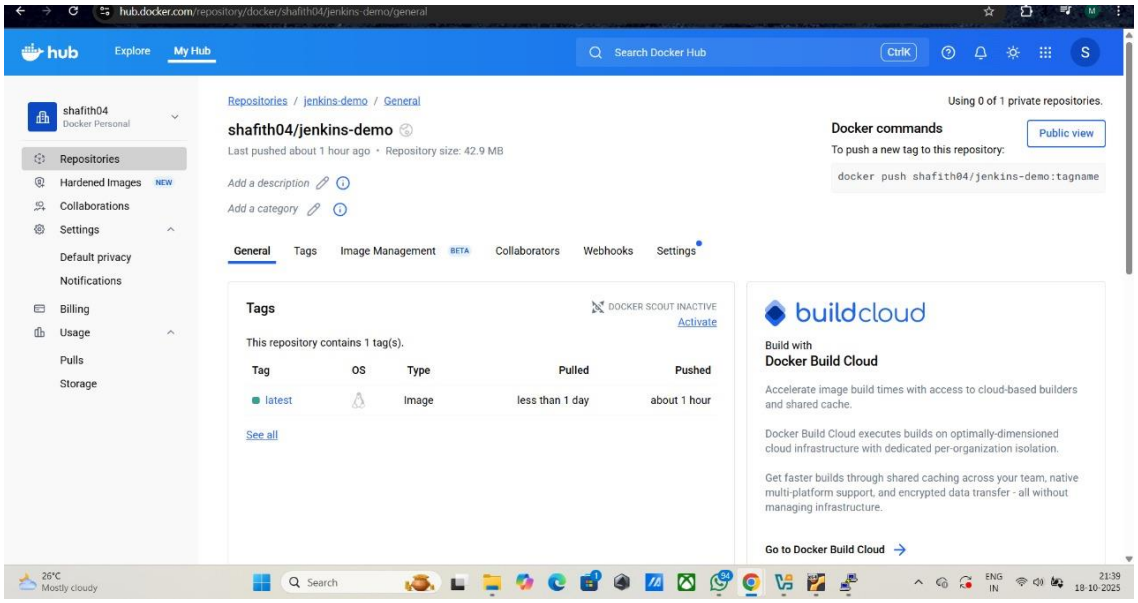


Fig:(2)



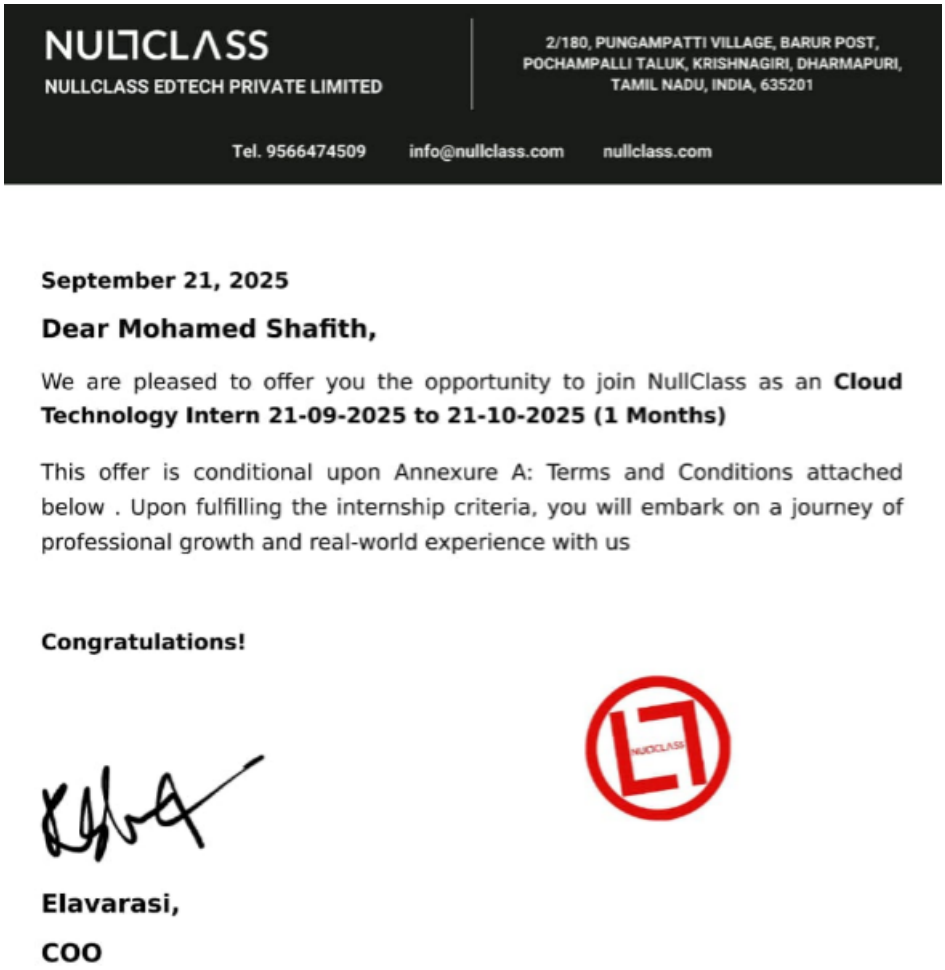
3.Docker Hub Repository:-

(Insert screenshot showing *shafith04/jenkins-demo* image with latest tag).



4. Offer Letter:-

As part of the internship documentation, the offer letter confirming the internship position was included.



NULLCLASS

NULLCLASS EDTECH PRIVATE LIMITED

2/180, PUNGAMPATTI VILLAGE, BARUR POST, POCHAMPALLI TALUK, KRISHNAGIRI, DHARMAPURI, TAMIL NADU, INDIA, 635201

Tel. 9566474509 info@nullclass.com nullclass.com

September 21, 2025

Dear Mohamed Shafith,

We are pleased to offer you the opportunity to join NullClass as an **Cloud Technology Intern 21-09-2025 to 21-10-2025 (1 Months)**

This offer is conditional upon Annexure A: Terms and Conditions attached below . Upon fulfilling the internship criteria, you will embark on a journey of professional growth and real-world experience with us

Congratulations!

Elavarasi,

COO

6. Conclusion:-

- Task 6 demonstrates a **complete CI/CD pipeline** using Jenkins.

- Any code change in app.js triggers the **automatic build and push** of Docker images

.

- Jenkins, GitHub, and Docker Hub integration ensures that deployment is **automated, fast, and error-free**.

- This task shows practical experience in **DevOps practices** and containerized deployments.