Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE CODE: DJS22ITHN1L1 **DATE: 31-01-2025**

COURSE NAME: DevOps Laboratory **CLASS: TY BTech**

NAME: Anish Sharma **ROLL: I011** **DIV: IT1-1**

EXPERIMENT NO. 4

CO/LO: Apply DevOps principles to meet software development requirements.

AIM / OBJECTIVE: To implement the pipeline of jobs using Maven in Jenkins, create a pipeline script to Test and deploy an application.

THEORY:

Implementing a Continuous Integration/Continuous Deployment (CI/CD) pipeline in Jenkins for a Maven-based Java application involves several key steps:

1. **Setting Up Jenkins and Required Tools:**
   - **Jenkins Installation: Ensure Jenkins is installed and running.**
   - **Maven Integration: Configure Maven in Jenkins by navigating to "Manage Jenkins" > "Global Tool Configuration" and adding a Maven installation. ○ Version Control: Integrate your source code repository (e.g., GitHub) with Jenkins.**
2. **Creating the Jenkins Pipeline:**
   - **Pipeline Script (Jenkinsfile): Define your build, test, and deployment stages in a Jenkinsfile stored in your repository. ○ Declarative Pipeline Syntax: Utilize Jenkins' declarative pipeline syntax for clarity and maintainability.**
3. **Defining Pipeline Stages:**
   - **Build Stage: Compile the code and package it using Maven. ○ Test Stage: Execute unit tests to ensure code quality. ○ Deploy Stage: Deploy the application to the desired environment, such as a web server like Apache Tomcat.**

4. **Sample Jenkinsfile: Below is an example of a declarative Jenkins Pipeline script for a Maven project:**

```
groovy

CopyEdit

pipeline {

agent any

tools {

      maven 'Maven' // Assumes 'Maven' is configured in Global Tool Configuration

  }    stages {

stage('Checkout') {

         steps {              git 'https://github.com/your-

repo/your-project.git'

         }

      }

      stage('Build') {          steps {

sh 'mvn clean package -DskipTests'

         }

      }

      stage('Test') {

steps {              sh

'mvn test'

         }          post {              always {

junit 'target/surefire-reports/*.xml'

           }

         }
```

```
    }
    stage('Deploy') {
steps {
        // Deployment steps, e.g., copying files to a server
sh 'scp target/your-app.war user@server:/path/to/deploy/'
      }
    }  }  post
{     cleanup {
cleanWs()
    }
  }
}
```

Explanation:

- **tools: Specifies the Maven installation to use.**
- **stages: Defines the sequence of stages: Checkout, Build, Test, and Deploy.**
- **post: Contains actions to perform after each stage or the entire pipeline, such as archiving test results or cleaning up the workspace.**

5. Enhancing the Pipeline:

- **Parallel Testing: Run tests in parallel to reduce execution time.**
- **Environment-Specific Deployments: Use parameters to deploy to different environments (development, staging, production).**
- **Notifications: Integrate with communication tools (e.g., email, Slack) to send build and deployment notifications.**

OUTPUT:

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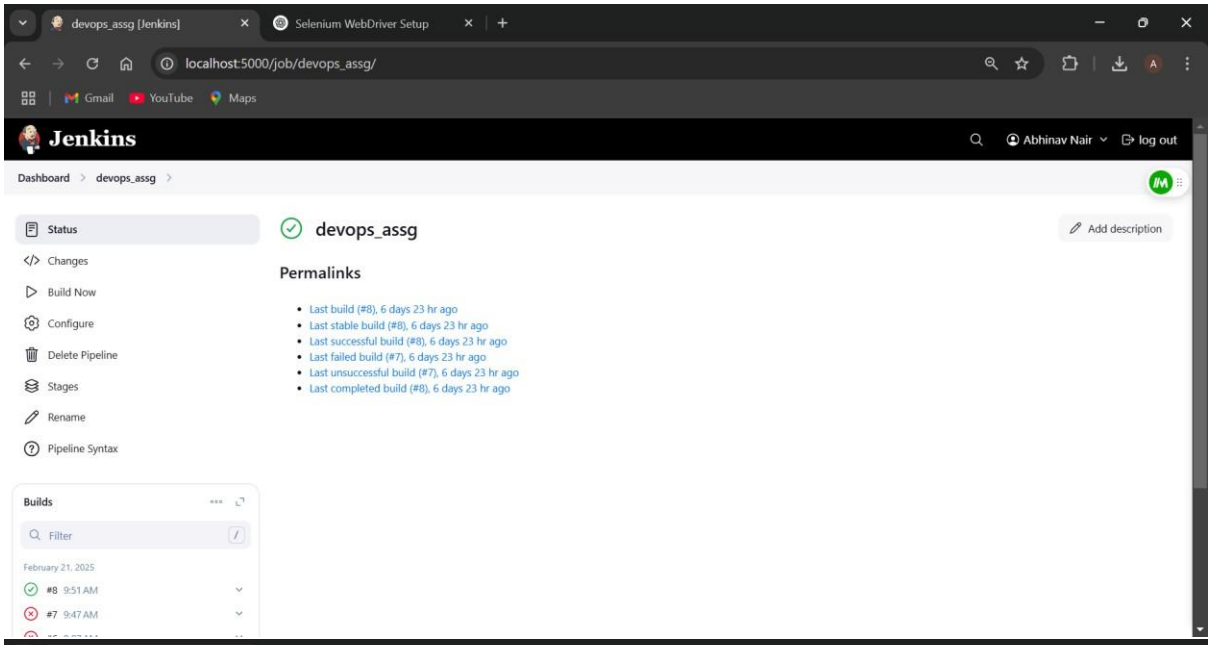

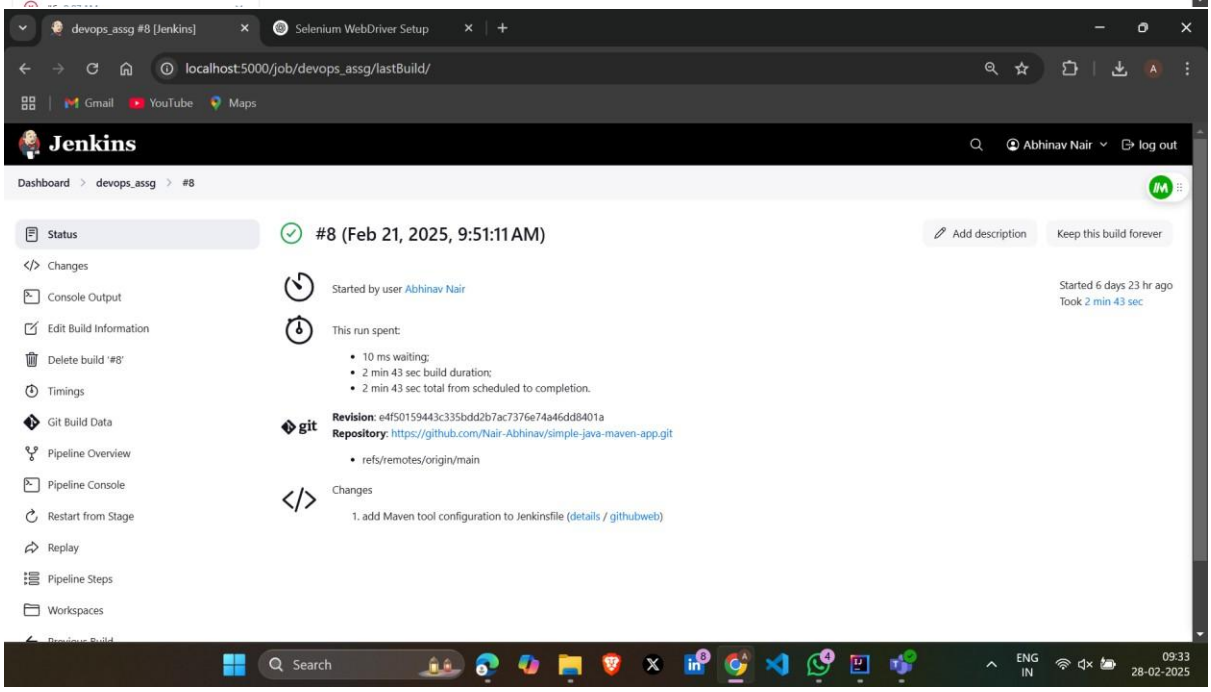

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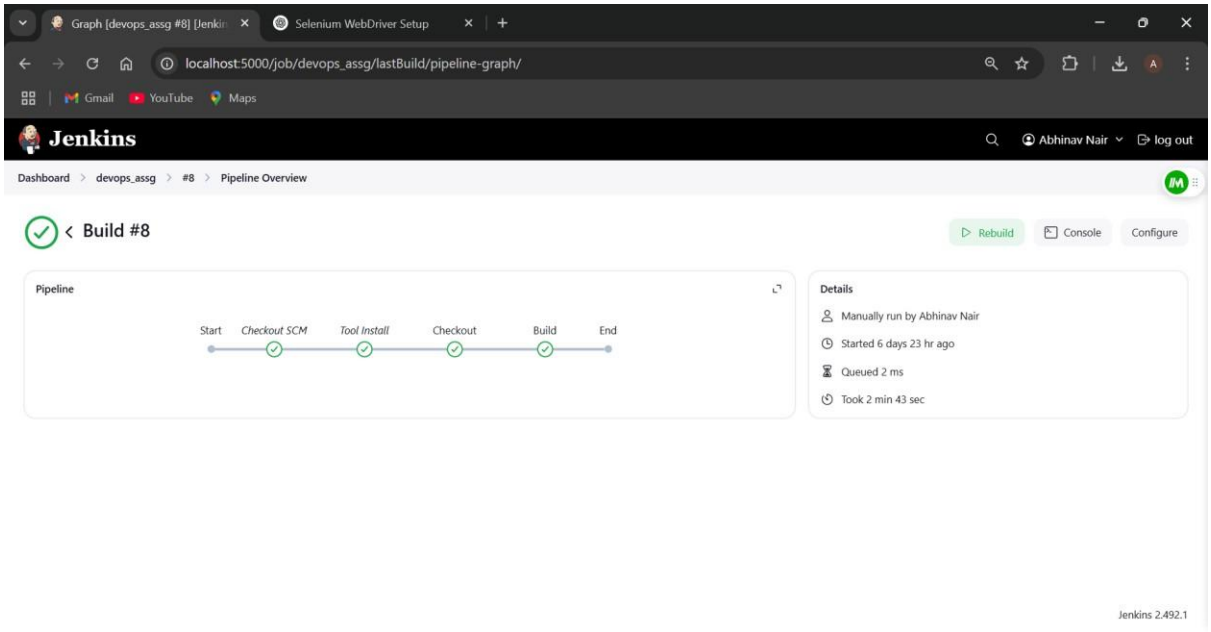

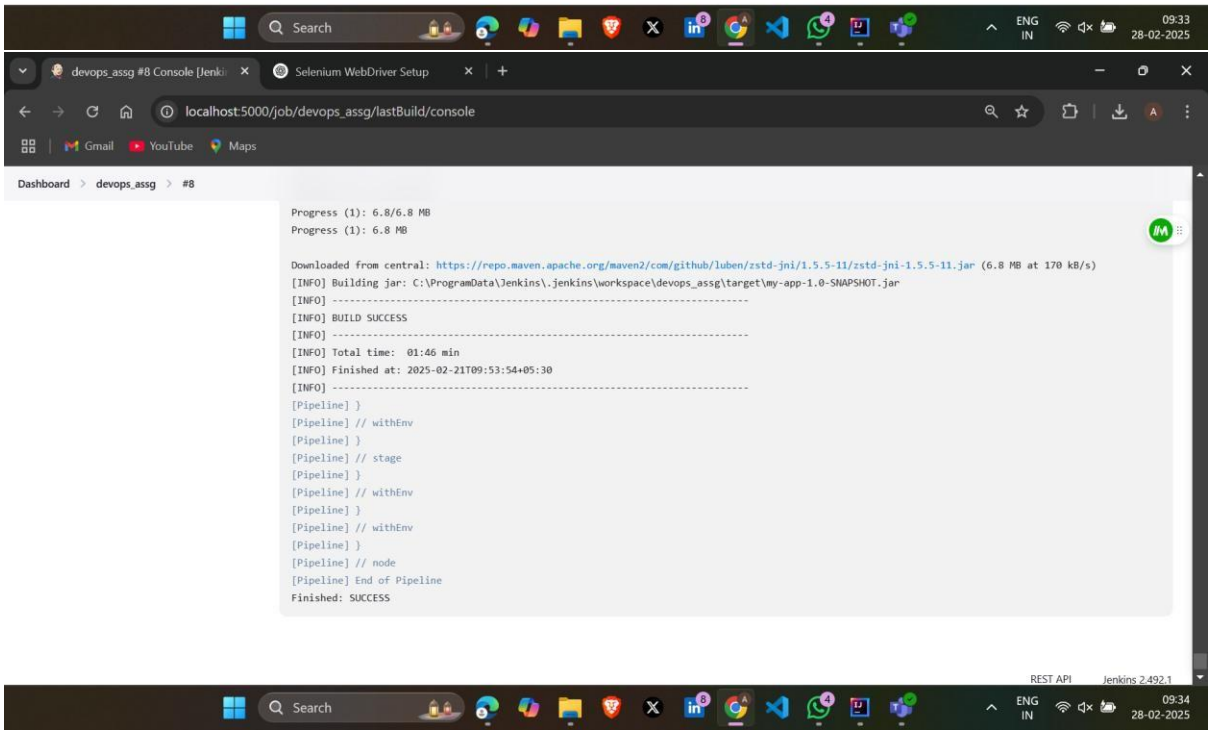

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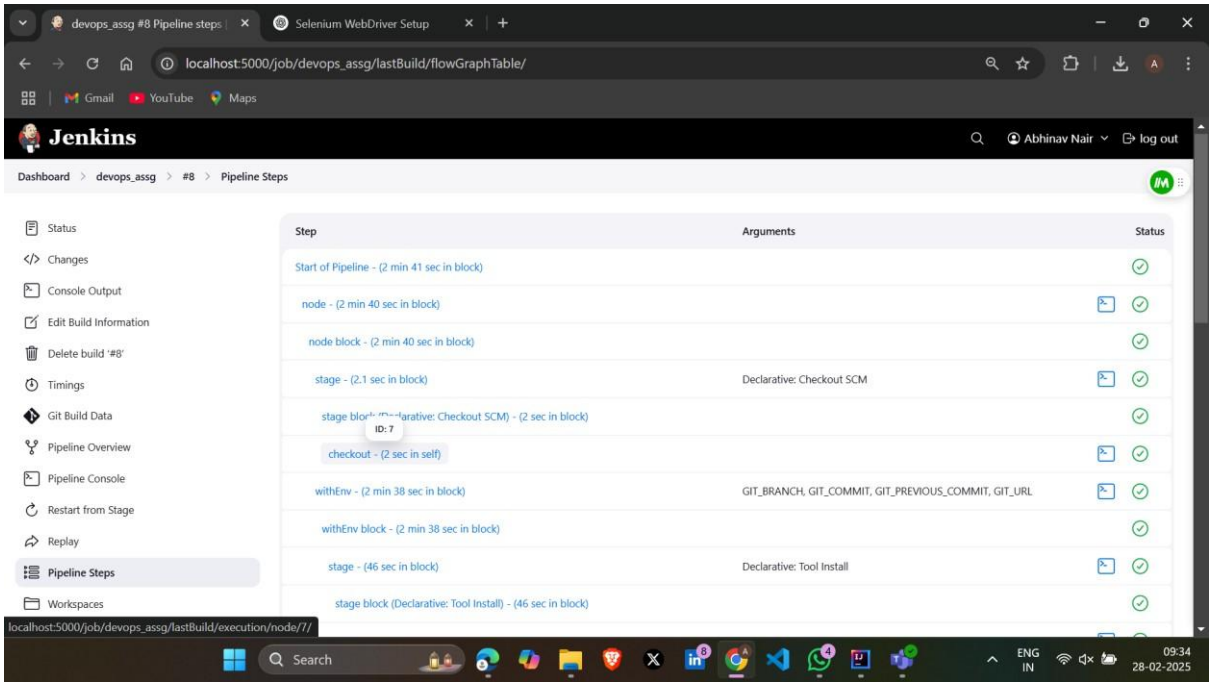

Conclusion:

In this experiment, we implemented the pipeline of jobs using Maven in Jenkins, create a pipeline script to Test and deploy an application.

References:

1. How to Use Git and GitHub – Version Control Basics for Beginners (freecodecamp.org)
2. Version Control Systems - GeeksforGeeks
3. VCS Program Details - Verra