Experiment 4: Jenkin Pipeline and Marven

Aim: is to create pipeline adn maven project using jenkins

Procedure :

Steps to write here are

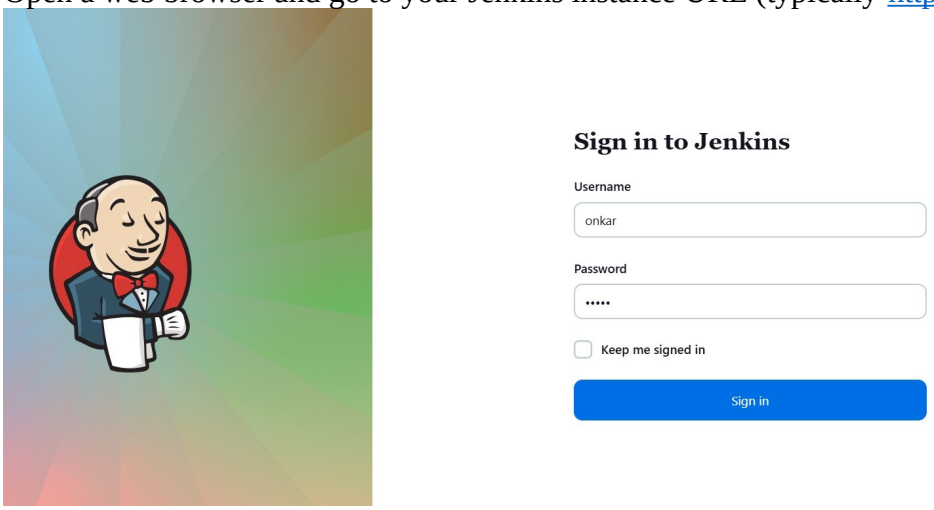
Part A - Snapshots of your project creation and execution with output generated for pipeline

1. **Jenkins installed and running** on your local machine or server. If not, you can follow the official Jenkins installation guide.

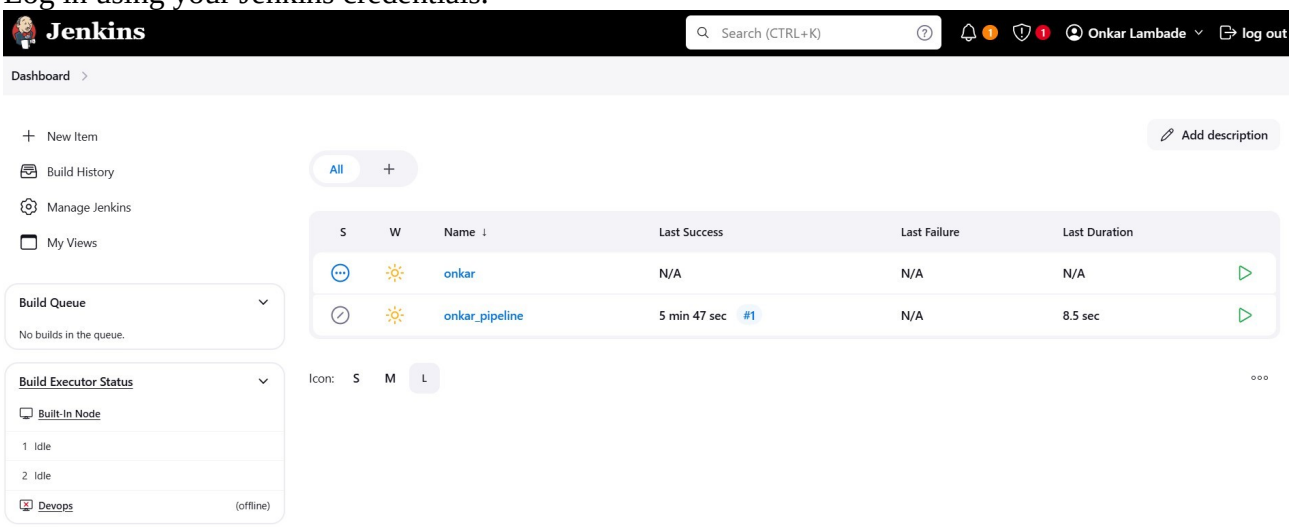
2. **Java installed** on your machine.

Step-by-Step Guide for Creating and Executing a Pipeline in Jenkins
Step 1: Log in to Jenkins

- Open a web browser and go to your Jenkins instance URL (typically http://localhost:8080).



- Log in using your Jenkins credentials.



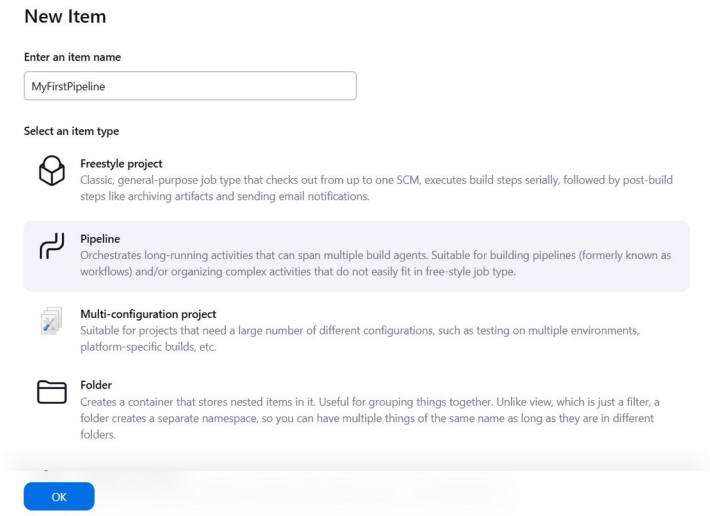
Step 2: Create a New Pipeline Project

1. From the Jenkins dashboard, click **“New Item”** on the left-hand menu.

2. Give your project a name, for example, MyFirstPipeline.

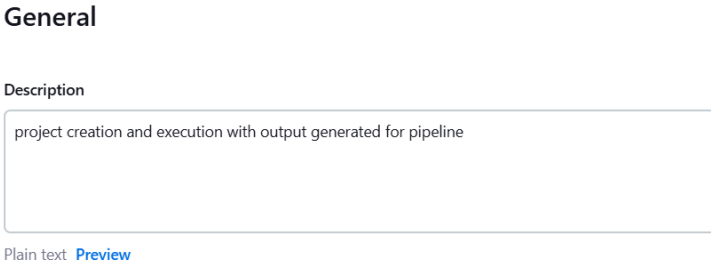
3. Select **“Pipeline”** as the project type.

4. Click **"OK"** to proceed.

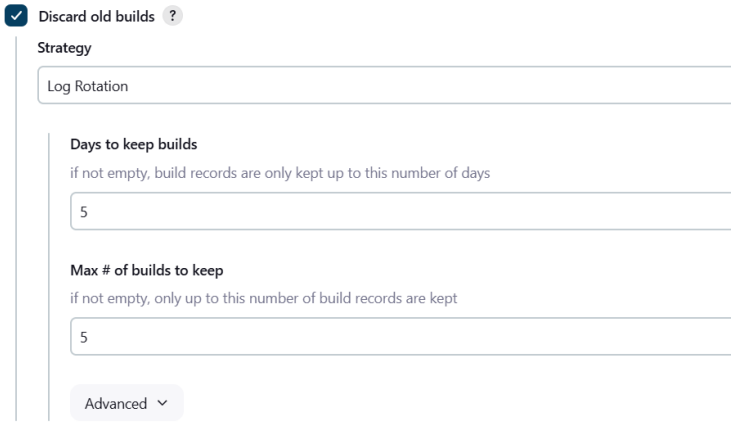


Step 3: Configure the Pipeline

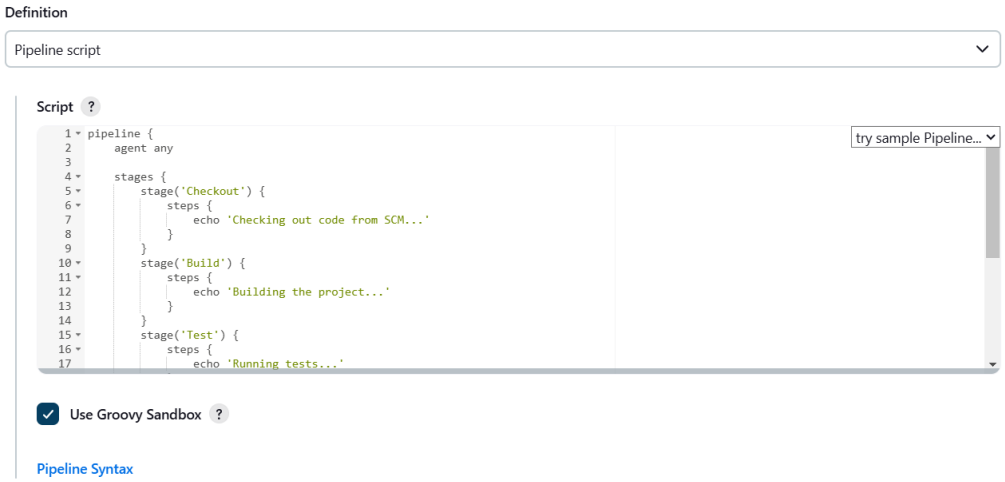
1. On the project configuration page, you can fill in the following fields:
   - **Description**: Describe what the pipeline does (optional).



   - **Discard old builds**: You can check this option to limit the number of builds to keep.



2. **Scroll down to the "Pipeline" section**:
   - **Definition**: Choose **"Pipeline script"** from the dropdown menu.



   - **Script**: In this field, you will define your pipeline script.

```
pipeline {
agent any

stages {
  stage('Checkout') {
    steps {
      echo 'Checking out code from SCM...'
    }
  }
  stage('Build') {
    steps {
      echo 'Building the project...'
    }
  }
  stage('Test') {
    steps {
      echo 'Running tests...'
    }
  }
  stage('Package') {
```

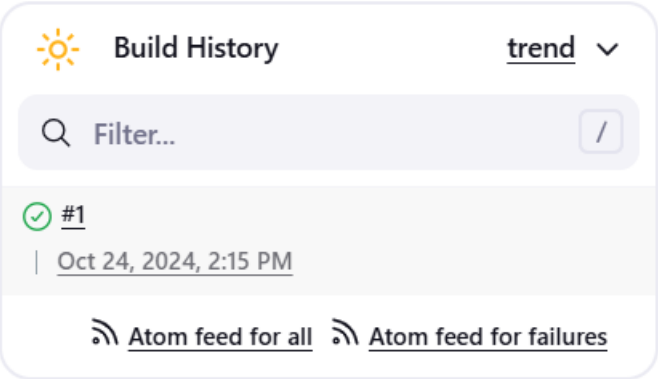
```
            steps {
                echo 'Packaging the application...'
            }
        }
        stage('Deploy') {
            steps {
                echo 'Deploying the application...'
            }
        }
    }
}
```

Step 5: Save and Build the Pipeline

1. **Click on "Save"** at the bottom of the configuration page.
2. On the project's main page, you should see a **"Build Now"** option on the left sidebar. Click on it to trigger the pipeline.

Step 6: Check the Output

1. Once the build is triggered, you can click on the build number under the **"Build History"** section to see the build details.



2. Click **"Console Output"** to see the real-time logs of your pipeline execution. You should see the output messages:

Console Output

```
Started by user Onkar Lambade
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/MyFirstPipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Checkout)
[Pipeline] echo
Checking out code from SCM...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Build)
[Pipeline] echo
Building the project...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Test)
[Pipeline] echo
Running tests...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Package)
[Pipeline] echo
```

```
Packaging the application...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] echo
Deploying the application...
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

3. If you see this output, congratulations! Your pipeline is working.

Part B -Snapshots of your project creation and execution with output generated for marven

1.Jenkins installed and running on your local machine or server. If not, you can follow the official Jenkins installation guide.

```
onkar@DESKTOP-D1SJIU7:~$ jenkins --version
2.462.2
```

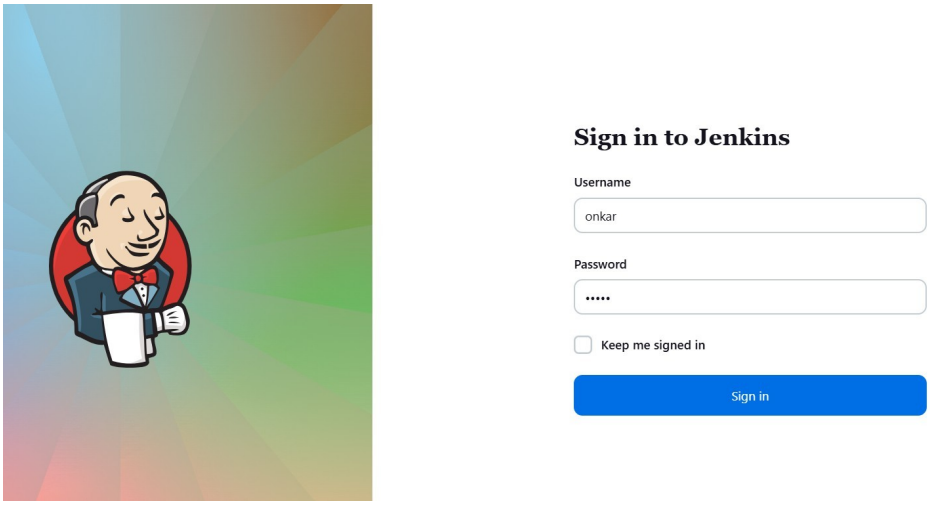
2.**Java installed** on your machine.

```
onkar@DESKTOP-D1SJIU7:~$ java --version
openjdk 11.0.24 2024-07-16
OpenJDK Runtime Environment (build 11.0.24+8-post-Ubuntu-1ubuntu322.04)
OpenJDK 64-Bit Server VM (build 11.0.24+8-post-Ubuntu-1ubuntu322.04, mixed mode, sharing)
```

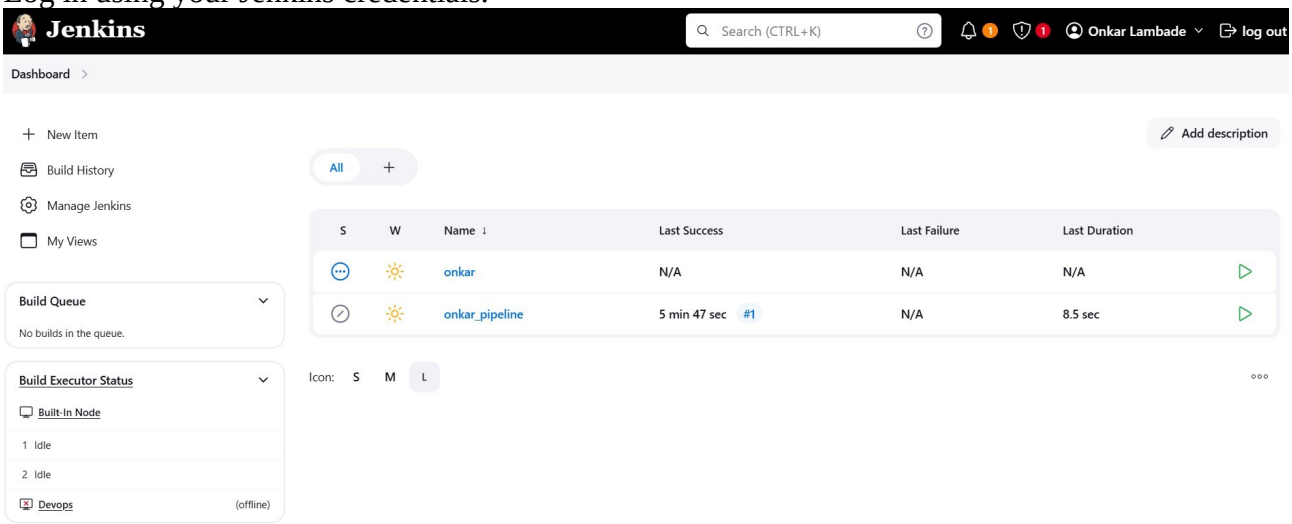
Step-by-Step Guide for Creating and Executing a Pipeline in Jenkins:-

Step 1: Log in to Jenkins

- Open a web browser and go to your Jenkins instance URL (typically http://localhost:8080).

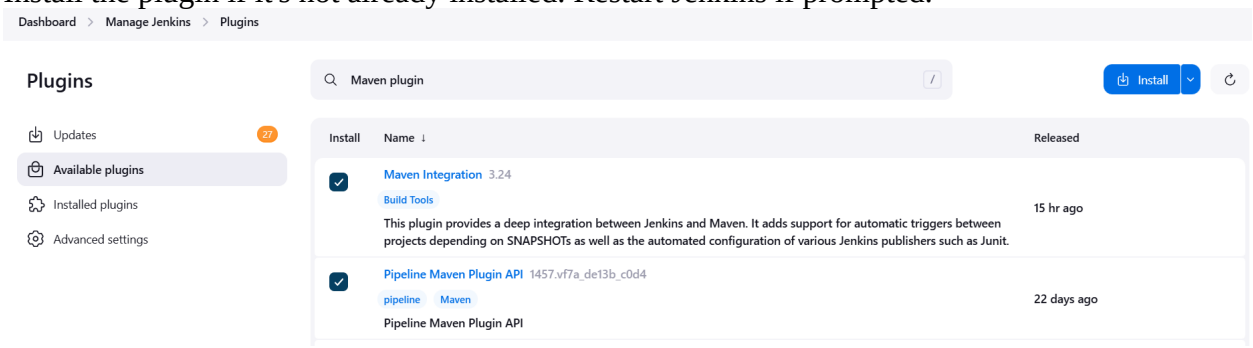


- Log in using your Jenkins credentials.



Step 2: Install the Maven Plugin (if not already installed)

1. Go to **"Manage Jenkins"** from the dashboard.
2. Click on **"Manage Plugins"**.
3. In the **"Available"** tab, search for **"Maven Integration"** or **"Maven Plugin"**.
4. Install the plugin if it's not already installed. Restart Jenkins if prompted.

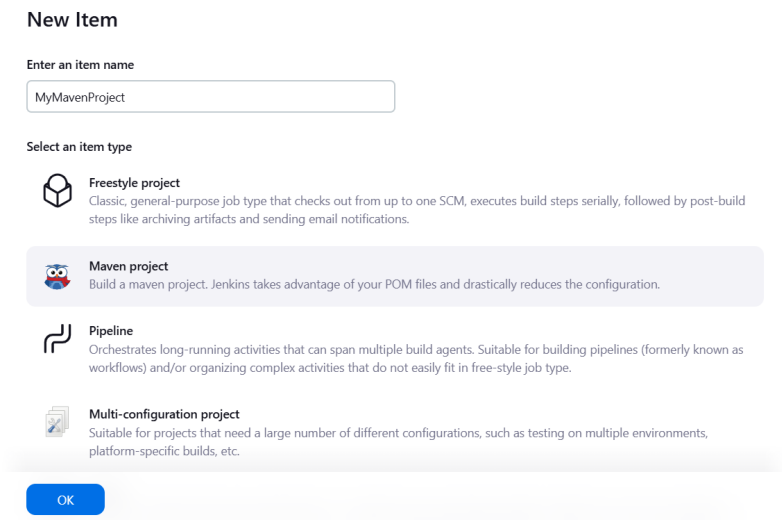


Step 3: Create a New Maven Project

1. **From the Jenkins dashboard, click on “New Item”.**

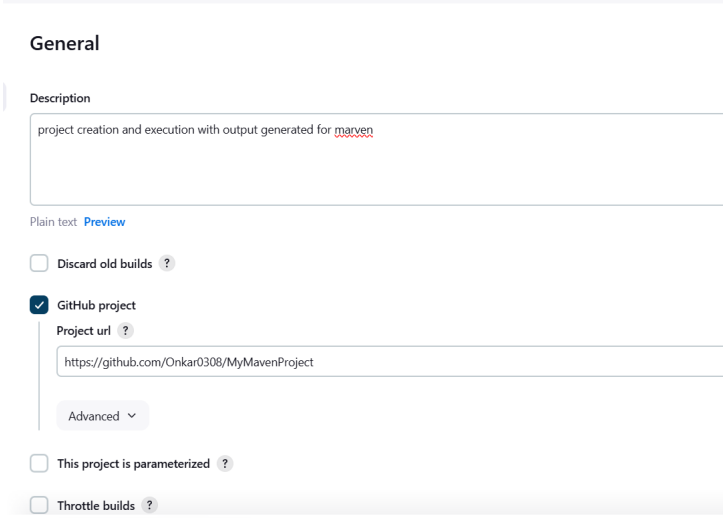
2. **Enter a name for your project, e.g., MyMavenProject.**

3. **Select “Maven Project” and click “OK”.**



Step 4: Configure the Maven Project

1. **Description: Optionally provide a description of your project.**

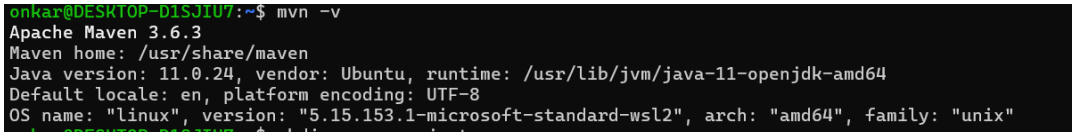


2. **GitHub project: If your Maven project is hosted on GitHub, you can provide the URL here.**

IF you don’t Have Github repository follow this steps:-

Step 1: Set Up Your Local Maven Project

1. **Install Maven (if you haven’t already):**
   - **Ensure that you have Maven installed on your machine. You can check by running mvn -v in your command line or terminal.**



```
onkar@DESKTOP-D1SJIU7:~$ mvn -v
Apache Maven 3.6.3
Maven home: /usr/share/maven
Java version: 11.0.24, vendor: Ubuntu, runtime: /usr/lib/jvm/java-11-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "5.15.153.1-microsoft-standard-wsl2", arch: "amd64", family: "unix"
```

2. **Create a New Maven Project:**
   - **Open your command line or terminal.**
   - **Navigate to the directory where you want to create your project:**
   -

```
onkar@DESKTOP-D1SJIU7:~$ mkdir mavenprojects
onkar@DESKTOP-D1SJIU7:~$ ls
1.py  172.25.90.203  main.tf  mavenprojects  my-terraform-project  onkar_devops  snap
onkar@DESKTOP-D1SJIU7:~$ cd mavenprojects/
```

Use the following Maven command to create a new project:

bash

Copy code

mvn archetype:generate -DgroupId=com.example -DartifactId=MyMavenProject -DarchetypeArtifactId=maven-archetype-quickstart -DinteractiveMode=false

- **Replace com.example with your desired group ID.**
- **Replace MyMavenProject with your desired artifact ID.**

```
onkar@DESKTOP-D1SJIU7:~/mavenprojects$ mvn archetype:generate -DgroupId=com.onkar -DartifactId=FirstMavenProject -Darche
typeArtifactId=maven-archetype-quickstart -DinteractiveMode=false
```

3. **Navigate to Your Project Directory:**

bash

4.

```
FirstMavenProject
onkar@DESKTOP-D1SJIU7:~/mavenprojects$ cd FirstMavenProject/
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ mvn clean install
[INFO] Scanning for projects...
[INFO]
[INFO] -------------------< com.onkar:FirstMavenProject >--------------------
[INFO] Building FirstMavenProject 1.0-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
```

Build Your Project (optional):

- **You can build your Maven project to ensure it's set up correctly:**

bash

Copy code

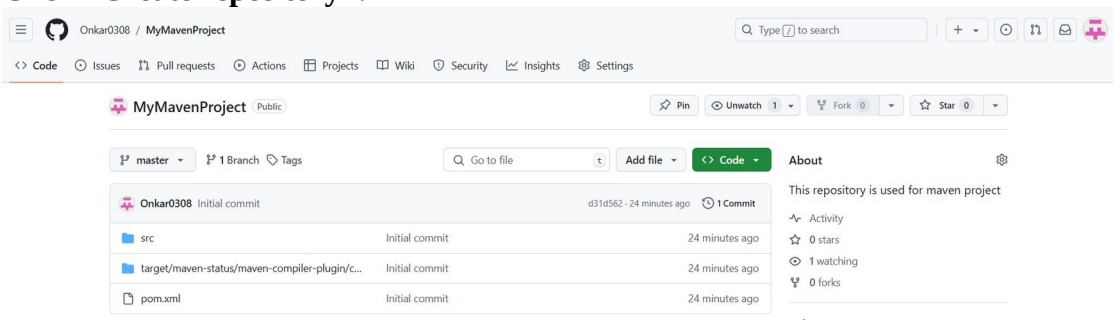
mvn clean install


```
FirstMavenProject
onkar@DESKTOP-D1SJIU7:~/mavenprojects$ cd FirstMavenProject/
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ mvn clean install
[INFO] Scanning for projects...
[INFO]
[INFO] -------------------< com.onkar:FirstMavenProject >--------------------
[INFO] Building FirstMavenProject 1.0-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
```


Step 2: Create a GitHub Repository

1. **Log in to GitHub:**
   - **Open a web browser and go to GitHub.**
   - **Log in to your account (or create one if you don't have an account).**
2. **Create a New Repository:**
   - **Click on the "+" icon in the top right corner and select "New repository".**
   - **Fill in the details:**
     - **Repository name: Enter a name for your repository, e.g., MyMavenProject.**
     - **Description: Add an optional description.**
     - **Public/Private: Choose whether you want your repository to be public or private.**
   - **Do not initialize with a README: Since you will be pushing an existing project.**

- **Click "Create repository".**



Step 3: Initialize Git in Your Local Project

1. **Initialize Git:**
   - **In your command line or terminal, still within the project directory (MyMavenProject), run:**
2.

```
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/onkar/mavenprojects/FirstMavenProject/.git/
```

Add Remote Repository:

- **Add the GitHub repository as a remote:**

```
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git remote add origin https://github.com/Onkar0308/MyMavenProje
ct.git
```

Replace yourusername with your GitHub username and adjust the URL according to the repository name.

3. **Stage Your Files:**
   - **Stage all files in your project for commit:**
4.

```
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git add .
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git commit -m "Initial commit"
[master (root-commit) d31d562] Initial commit
 5 files changed, 70 insertions(+)
 create mode 100644 pom.xml
 create mode 100644 src/main/java/com/onkar/App.java
 create mode 100644 src/test/java/com/onkar/AppTest.java
 create mode 100644 target/maven-status/maven-compiler-plugin/compile/default-compile/createdFiles.lst
 create mode 100644 target/maven-status/maven-compiler-plugin/compile/default-compile/inputFiles.lst
```

Commit Your Changes:

- **Commit the staged files:**

```
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git add .
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git commit -m "Initial commit"
[master (root-commit) d31d562] Initial commit
 5 files changed, 70 insertions(+)
 create mode 100644 pom.xml
 create mode 100644 src/main/java/com/onkar/App.java
 create mode 100644 src/test/java/com/onkar/AppTest.java
 create mode 100644 target/maven-status/maven-compiler-plugin/compile/default-compile/createdFiles.lst
 create mode 100644 target/maven-status/maven-compiler-plugin/compile/default-compile/inputFiles.lst
```

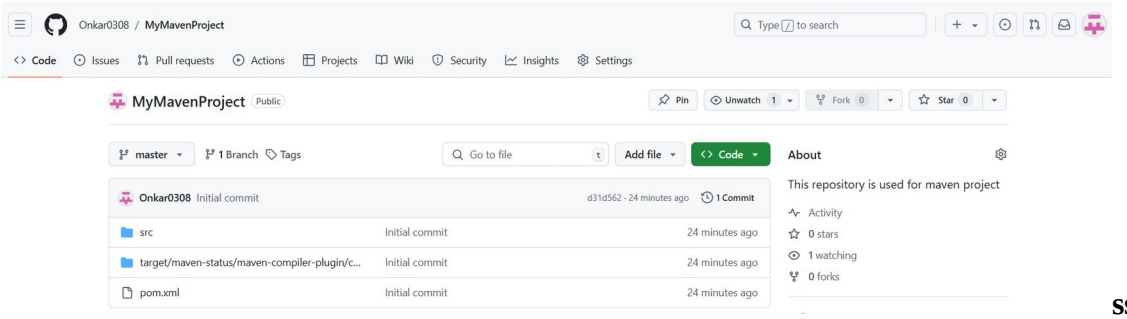
Step 4: Push Your Project to GitHub

1. **Push to GitHub:**
   - **Push your local commits to the GitHub repository:**

```
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$ git push -u origin master
Username for 'https://github.com': Onkar0308
Password for 'https://Onkar0308@github.com':
Enumerating objects: 21, done.
Counting objects: 100% (21/21), done.
Delta compression using up to 8 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (21/21), 1.74 KiB | 592.00 KiB/s, done.
Total 21 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/Onkar0308/MyMavenProject.git
 * [new branch]      master -> master
Branch 'master' set up to track remote branch 'master' from 'origin'.
onkar@DESKTOP-D1SJIU7:~/mavenprojects/FirstMavenProject$
```

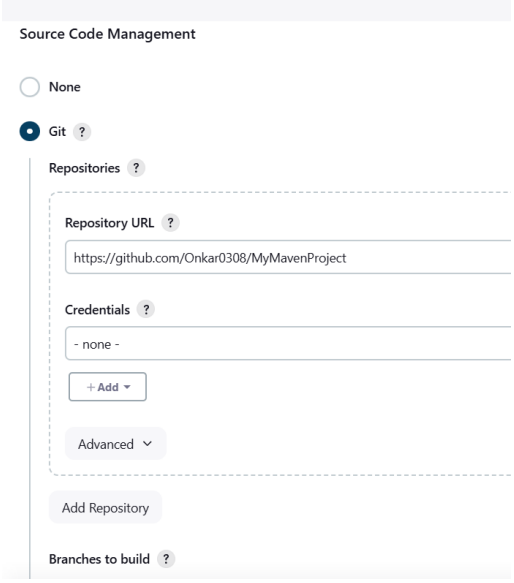
Step 5: Verify Your Project on GitHub

1. **Go back to GitHub:**
   - **Refresh your repository page. You should see your Maven project files uploaded to GitHub.**

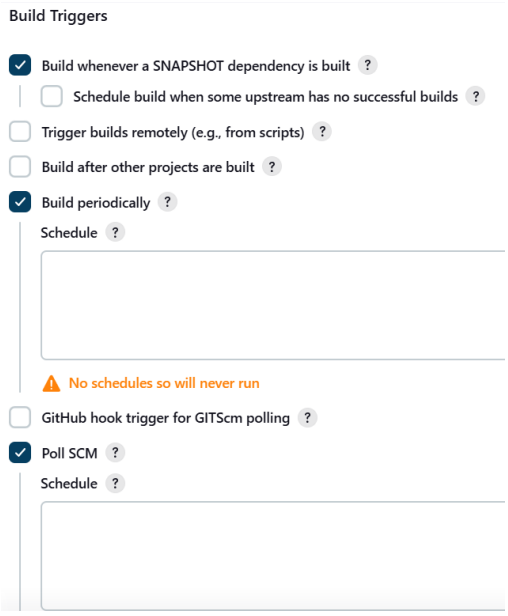


ss

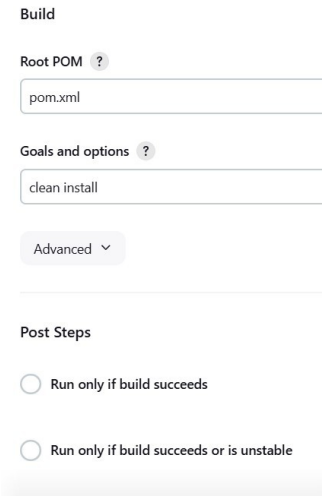
3. **Source Code Management:**
   - **Choose "Git" if your project is in a Git repository.**
   - **Enter the repository URL and credentials if needed.**



4. **Build Triggers:**
   - **You can check options like "Poll SCM" or "Build periodically" depending on your needs.**



5. **Build:**
   - **In the "Goals and options" section, enter the Maven goals, for example, clean install to clean and build the project.**



   - **Optionally specify other parameters, such as -DskipTests to skip tests.**

6. **Advanced Settings: Click on "Advanced" if you need to set up specific Maven settings or profiles.**

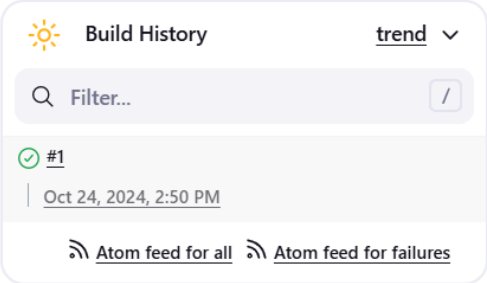
Step 5: Save the Configuration

- **Click "Save" at the bottom of the page to store your project settings.**

Step 6: Build the Maven Project

1. **On the project's main page, you will see a "Build Now" option on the left sidebar. Click it to trigger the Maven build.**

2. **You will see a build history entry with a timestamp.**



Step 7: Check the Output

1. **Click on the build number (usually labeled as #1 for the first build) under the "Build History" section to view build details.**

2. **Click on "Console Output" to see the logs of your Maven build process.**

Sample Output: You should see output logs similar to the following:

Console Output

Download | Copy | View as plain text

```
Started by user Onkar Lambade
Running as SYSTEM
Building on the built-in node in workspace /var/lib/jenkins/workspace/MyMavenProject
Unpacking https://repo.maven.apache.org/maven2/org/apache/maven/apache-maven/3.9.9/apache-maven-3.9.9-bin.zip to
/var/lib/jenkins/tools/hudson.tasks.Maven_MavenInstallation/maven on Jenkins
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/Onkar0308/MyMavenProject
 > git init /var/lib/jenkins/workspace/MyMavenProject # timeout=10
Fetching upstream changes from https://github.com/Onkar0308/MyMavenProject
 > git --version # timeout=10
 > git --version # 'git version 2.34.1'
 > git fetch --tags --force --progress -- https://github.com/Onkar0308/MyMavenProject +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git config remote.origin.url https://github.com/Onkar0308/MyMavenProject # timeout=10
 > git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
 > git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision d31d56247394d7ceb95e65ac9d1363c8eae2b25d (refs/remotes/origin/master)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f d31d56247394d7ceb95e65ac9d1363c8eae2b25d # timeout=10
Commit message: "Initial commit"
First time build. Skipping changelog.
Parsing POMs
Discovered a new module com.onkar:FirstMavenProject FirstMavenProject
Modules changed, recalculating dependency graph
```

```
commons-1.14.jar 37207
<===[JENKINS REMOTING CAPACITY]===>channel started
Executing Maven:  -B -f /var/lib/jenkins/workspace/MyMavenProject/pom.xml clean install
[INFO] Scanning for projects...
[INFO]
[INFO] -------------------< com.onkar:FirstMavenProject >--------------------
[INFO] Building FirstMavenProject 1.0-SNAPSHOT
[INFO]   from pom.xml
[INFO] --------------------------------[ jar ]---------------------------------
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.2.0/maven-clean-plugin-3.2.0.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.2.0/maven-clean-plugin-3.2.0.pom
(5.3 kB at 17 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/35/maven-plugins-35.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/35/maven-plugins-35.pom (9.9 kB at 367
kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/35/maven-parent-35.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/35/maven-parent-35.pom (45 kB at 1.0 MB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/apache/25/apache-25.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/25/apache-25.pom (21 kB at 642 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.2.0/maven-clean-plugin-3.2.0.jar
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.2.0/maven-clean-plugin-3.2.0.jar
(36 kB at 776 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-resources-plugin/3.3.1/maven-resources-plugin-
3.3.1.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-resources-plugin/3.3.1/maven-resources-plugin-
3.3.1.pom (8.2 kB at 272 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/39/maven-plugins-39.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/39/maven-plugins-39.pom (8.1 kB at 476
```

```
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/resolver/maven-resolver-api/1.9.18/maven-resolver-api-
1.9.18.pom
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/resolver/maven-resolver-api/1.9.18/maven-resolver-api-
1.9.18.pom (2.7 kB at 167 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/resolver/maven-resolver-util/1.9.18/maven-resolver-util-
1.9.18.jar
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/resolver/maven-resolver-util/1.9.18/maven-resolver-util-
1.9.18.jar (196 kB at 5.2 MB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/resolver/maven-resolver-api/1.9.18/maven-resolver-api-
1.9.18.jar
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/resolver/maven-resolver-api/1.9.18/maven-resolver-api-
1.9.18.jar (157 kB at 4.2 MB/s)
[INFO] Installing /var/lib/jenkins/workspace/MyMavenProject/pom.xml to /var/lib/jenkins/.m2/repository/com/onkar/FirstMavenProject/1.0-
SNAPSHOT/FirstMavenProject-1.0-SNAPSHOT.pom
[INFO] Installing /var/lib/jenkins/workspace/MyMavenProject/target/FirstMavenProject-1.0-SNAPSHOT.jar to
/var/lib/jenkins/.m2/repository/com/onkar/FirstMavenProject/1.0-SNAPSHOT/FirstMavenProject-1.0-SNAPSHOT.jar
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  12.695 s
[INFO] Finished at: 2024-10-24T14:43:22+05:30
[INFO] ------------------------------------------------------------------------
Waiting for Jenkins to finish collecting data
[JENKINS] Archiving /var/lib/jenkins/workspace/MyMavenProject/pom.xml to com.onkar/FirstMavenProject/1.0-SNAPSHOT/FirstMavenProject-1.0-SNAPSHOT.pom
[JENKINS] Archiving /var/lib/jenkins/workspace/MyMavenProject/target/FirstMavenProject-1.0-SNAPSHOT.jar to com.onkar/FirstMavenProject/1.0-
SNAPSHOT/FirstMavenProject-1.0-SNAPSHOT.jar
channel stopped
Finished: SUCCESS
```

Conclusion : Frame your conclusion here

References: Include your references here

Rubrics: 5 marks for 1st part and 5 mark for second part - 100- 80 % - 5, 80- 60%- 4 and so on