

# DevOps Documentation

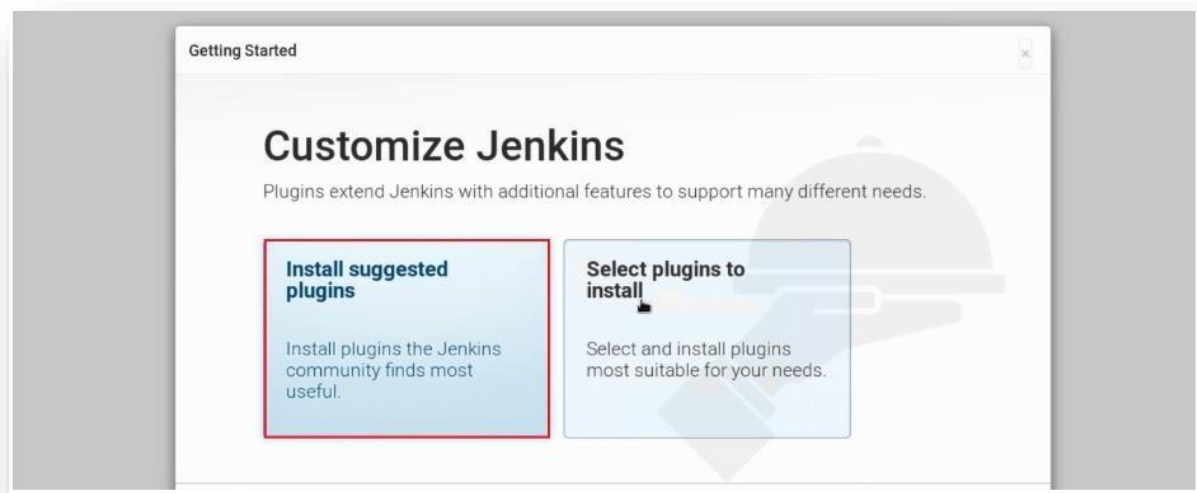
## **Tools used and its version : -**

- Jenkins 2.23
- SonarQube 6.7
- Nexus Repository 3
- Tomcat 9x

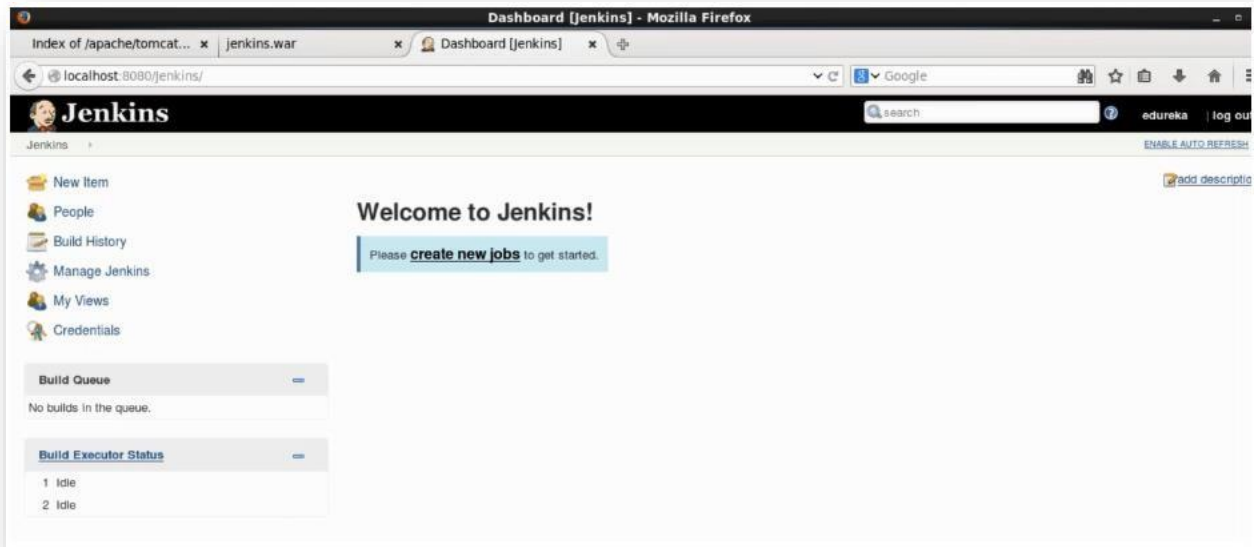
- **Step 1: Install Jenkins**
- Download Jenkins from <https://www.jenkins.io/download/>
- Unlock Jenkins with administrator password



- Select the suggested plugins.



- Jenkins Started then create new jobs

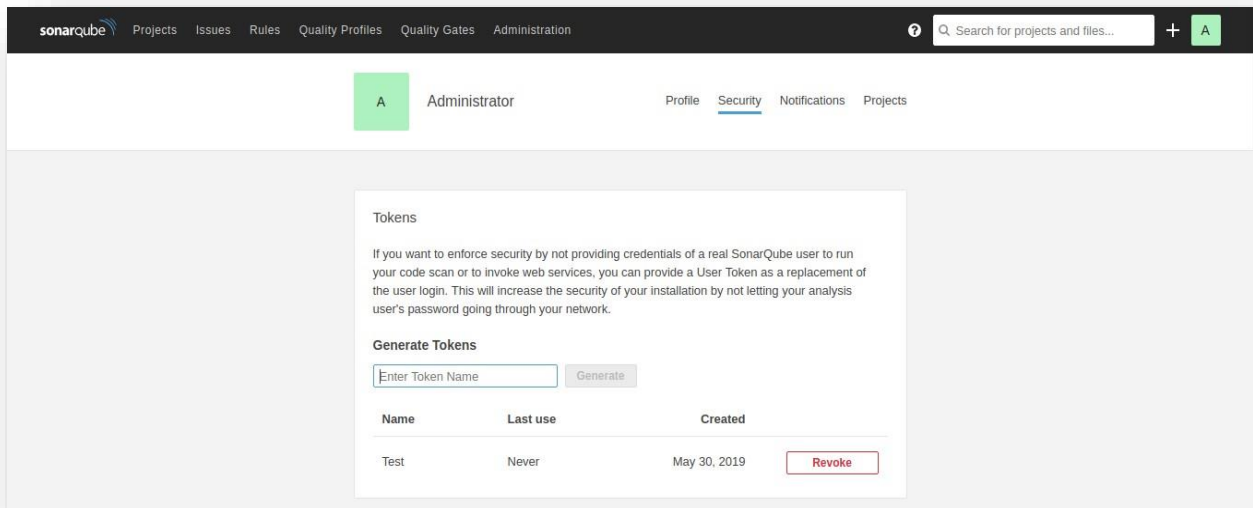
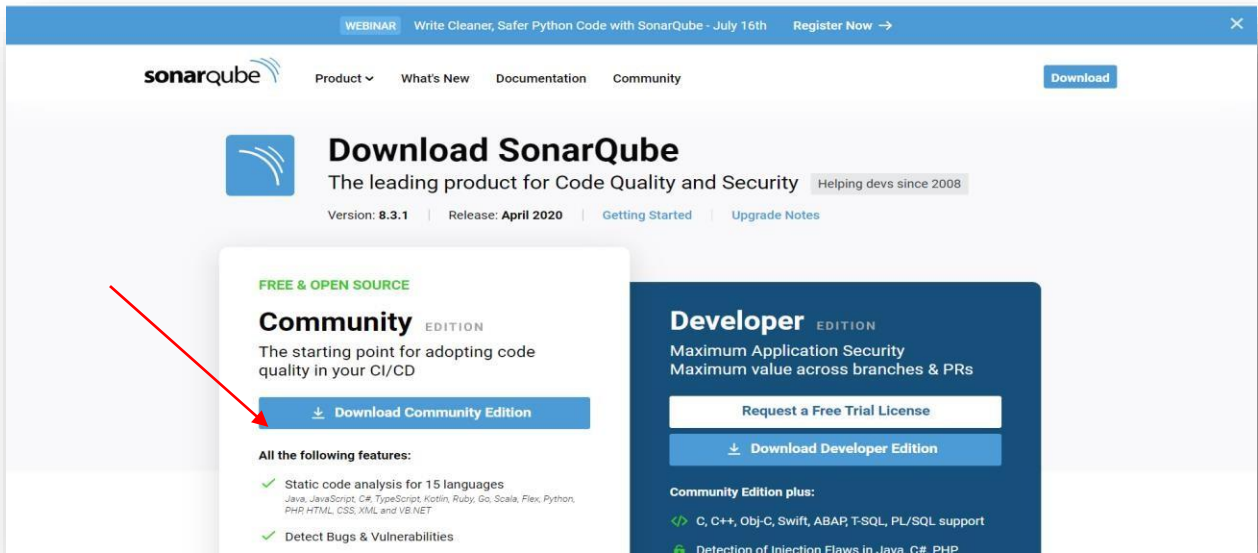


## Step 2: Install the required plugins:

- Go to the manage plugins.
- Select the available plugins.
- For deploying install “Deploy to container plugin”.
- For pipeline install “Delivery Pipeline plugin”.
- For Nexus Repository install “Nexus Artifact Uploader”.
- For SonarQube install “SonarQube Scanner plugin”.

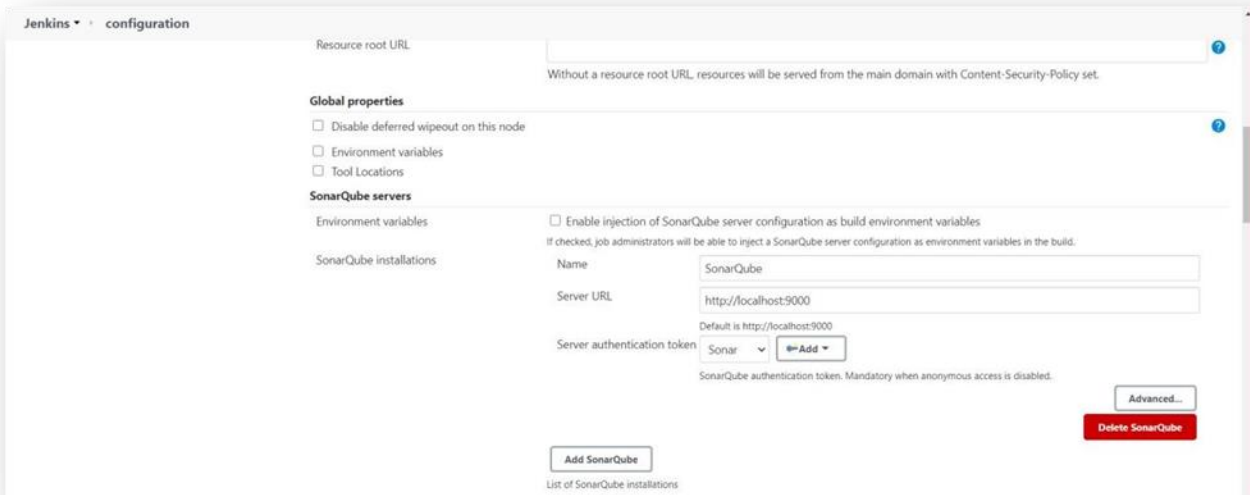
### Step 3: Install the SonarQube:

- Install SonarQube from <https://www.sonarqube.org/downloads/>



## Step 4: Configure SonarQube with Jenkins:

- Go to Manage Jenkins
- Configure Systems
- SonarQube Servers



The screenshot shows the Jenkins configuration page for SonarQube servers. The page is titled "Jenkins configuration" and has a "Resource root URL" field at the top. Below this, there are sections for "Global properties" and "SonarQube servers". The "SonarQube servers" section includes a checkbox for "Enable injection of SonarQube server configuration as build environment variables" and a list of "SonarQube installations". One installation is shown with the name "SonarQube", server URL "http://localhost:9000", and server authentication token "Sonar". There are buttons for "Add SonarQube" and "Delete SonarQube".

Resource root URL

Without a resource root URL, resources will be served from the main domain with Content-Security-Policy set.

**Global properties**

- ☐ Disable deferred wipeout on this node
- ☐ Environment variables
- ☐ Tool Locations

**SonarQube servers**

Environment variables

☐ Enable injection of SonarQube server configuration as build environment variables

If checked, job administrators will be able to inject a SonarQube server configuration as environment variables in the build.

SonarQube installations

Name: SonarQube

Server URL: http://localhost:9000

Server authentication token: Sonar

Default is http://localhost:9000

SonarQube authentication token. Mandatory when anonymous access is disabled.

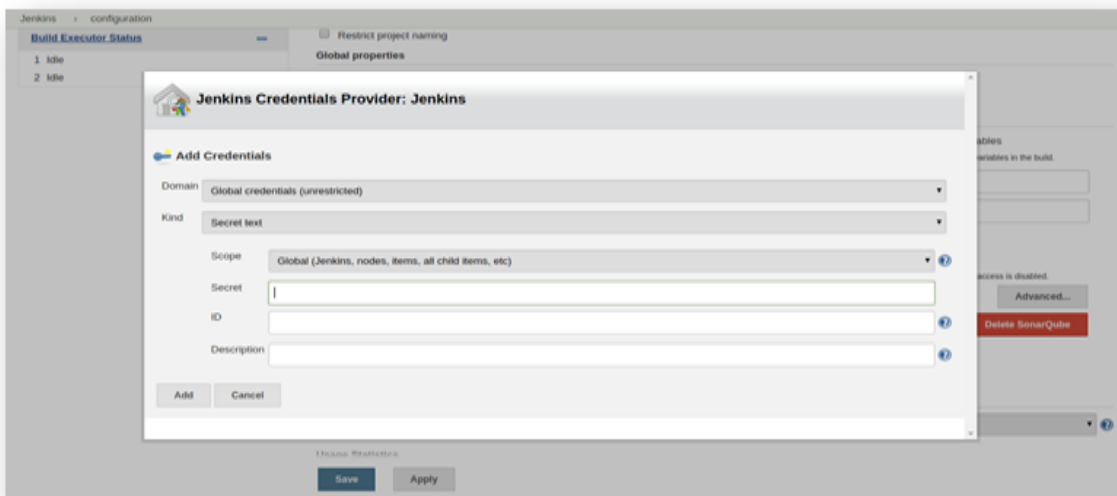
Advanced...

Delete SonarQube

Add SonarQube

List of SonarQube installations

- SonarQube server always run on <http://localhost:9000>
- Now click on add.



The screenshot shows the Jenkins Credentials Provider: Jenkins dialog box. The dialog box has a title bar "Jenkins Credentials Provider: Jenkins" and a "Add Credentials" button. It contains fields for "Domain" (Global credentials (unrestricted)), "Kind" (Secret text), "Scope" (Global (Jenkins, nodes, items, all child items, etc)), "Secret" (a text input field), "ID" (a text input field), and "Description" (a text input field). There are "Add" and "Cancel" buttons at the bottom.

Jenkins Credentials Provider: Jenkins

Add Credentials

Domain: Global credentials (unrestricted)

Kind: Secret text

Scope: Global (Jenkins, nodes, items, all child items, etc)

Secret:

ID:

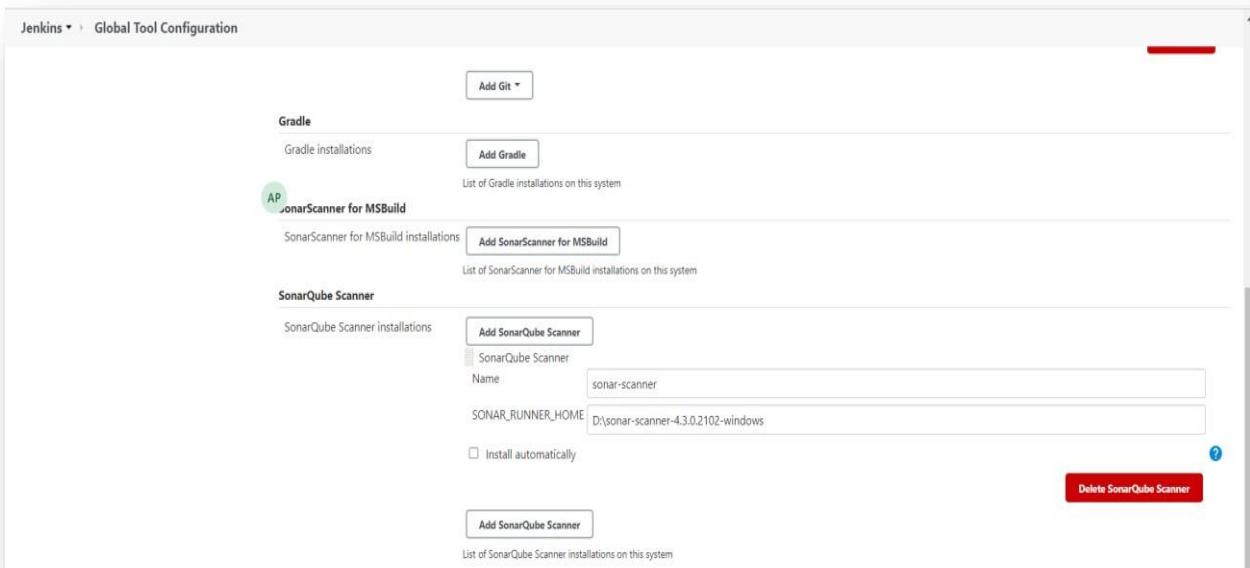
Description:

Add Cancel

Save Apply

## Step 5: Configure Sonar Scanner with Jenkins:

- Download Sonar Scanner from <https://docs.sonarqube.org/latest/analysis/scan/sonarscanner/>
- Go to Manage Jenkins
- Global Tool Configuration
- SonarQube Scanner



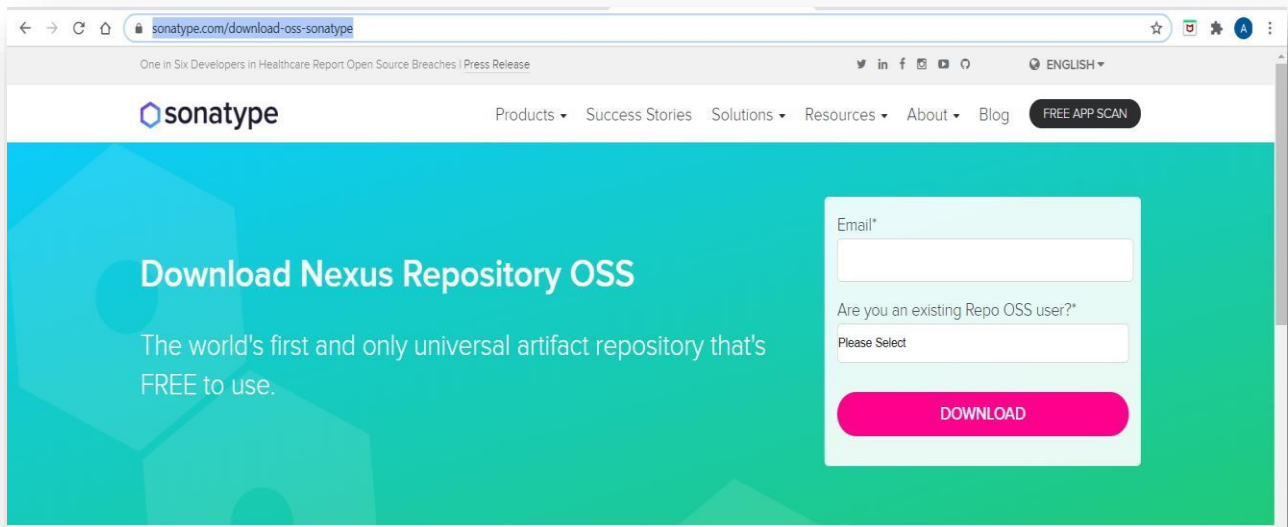
The screenshot shows the Jenkins 'Global Tool Configuration' page. The 'SonarQube Scanner' section is active, indicated by a green circle and 'AP' label. It contains a table for 'SonarQube Scanner installations' with one entry. The entry has a checkbox for 'SonarQube Scanner' which is checked, a 'Name' field with the value 'sonar-scanner', and a 'SONAR\_RUNNER\_HOME' field with the value 'D:\sonar-scanner-4.3.0.2102-windows'. There is an 'Add SonarQube Scanner' button at the bottom of the table and a 'Delete SonarQube Scanner' button at the bottom right of the section. Above the table, there are buttons for 'Add SonarScanner for MSBuild' and 'Add SonarScanner for MSBuild' (disabled).

SonarQube Scanner installations	
<input checked="" type="checkbox"/> SonarQube Scanner	<div>Name: sonar-scanner</div> <div>SONAR_RUNNER_HOME: D:\sonar-scanner-4.3.0.2102-windows</div> <div><input type="checkbox"/> Install automatically</div>

- Here give name and path of the sonar scanner.
- Now apply and save it.

## Step 5: Install the Nexus Repository:

- Download Nexus from <https://www.sonatype.com/download-oss-sonatype>

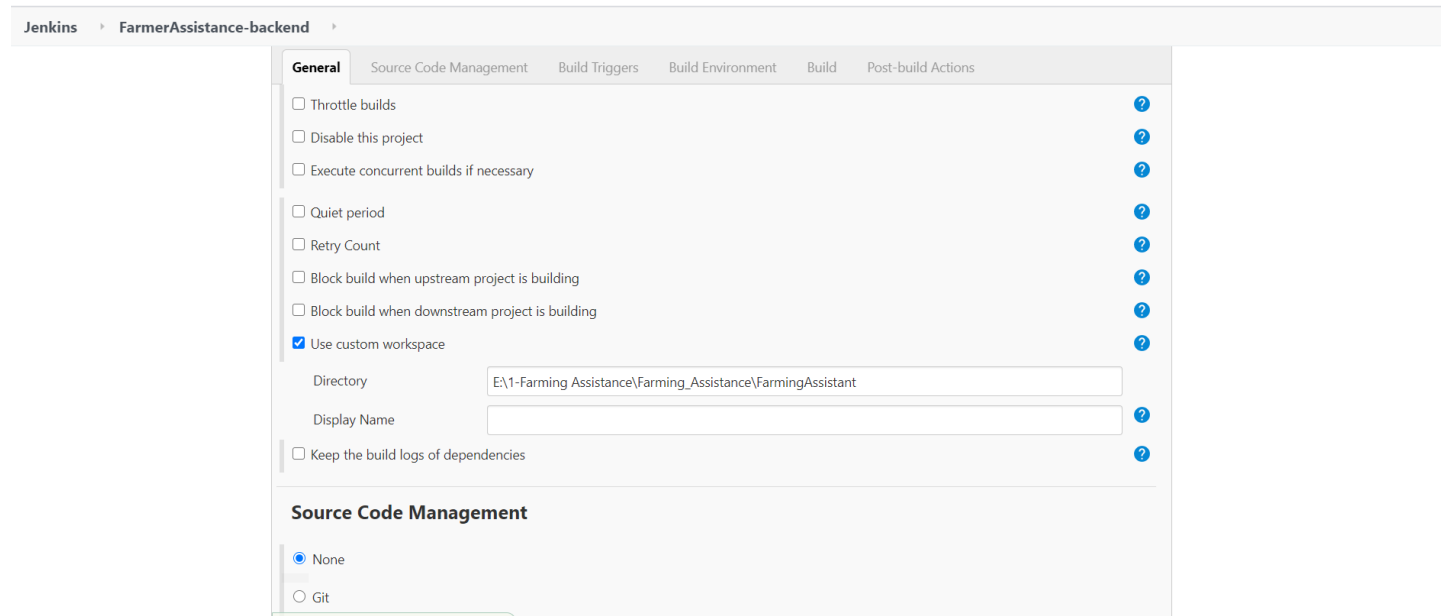


## Step 6: Create the freestyle project(without pipeline):

- Select new item.
- Select freestyle project.
- Click on OK.

## Step 7: Freestyle Project Configuration:

- Give the path of directory.



The screenshot shows the Jenkins configuration page for a project named 'FarmerAssistance-backend'. The 'General' tab is selected, displaying various build options. The 'Use custom workspace' checkbox is checked, and the 'Directory' field is set to 'E:\1-Farming Assistance\Farming\_Assistance\FarmingAssistant'. The 'Source Code Management' section shows 'None' as the selected provider.

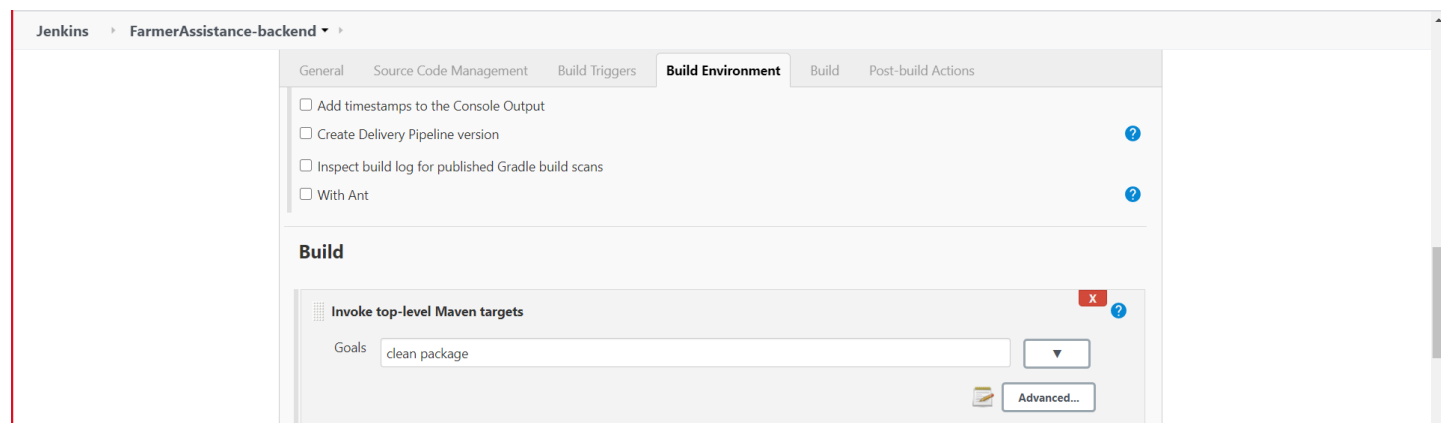
**General**

- ☐ Throttle builds
- ☐ Disable this project
- ☐ Execute concurrent builds if necessary
- ☐ Quiet period
- ☐ Retry Count
- ☐ Block build when upstream project is building
- ☐ Block build when downstream project is building
- ☒ Use custom workspace
  - Directory: E:\1-Farming Assistance\Farming\_Assistance\FarmingAssistant
  - Display Name:
- ☐ Keep the build logs of dependencies

**Source Code Management**

- ☒ None
- ☐ Git

- Build Project:



The screenshot shows the Jenkins configuration page for the same project, now with the 'Build Environment' tab selected. It displays options for console output and build environment. The 'Build' section shows 'Invoke top-level Maven targets' with the goal 'clean package'.

**Build Environment**

- ☐ Add timestamps to the Console Output
- ☐ Create Delivery Pipeline version
- ☐ Inspect build log for published Gradle build scans
- ☐ With Ant

**Build**

**Invoke top-level Maven targets**

Goals: clean package

Advanced...



- Add Nexus Repository Details:

Jenkins > FarmerAssistance-backend >

General Source Code Management Build Triggers Build Environment **Build** Post-build Actions

**Nexus artifact uploader**

**Nexus Details**

Nexus Version: NEXUS3

Protocol: HTTP

Nexus URL: localhost:8081/

Credentials: admin/\*\*\*\*\* (Nexus) [Add](#)

GroupId: com.cap

Version: 0.0.1-SNAPSHOT

Repository: maven-snapshots

Artifacts

Artifact

ArtifactId: SpringApp

Type: WAR

Classifier:

File: E:\1-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\SpringApp-0.0.1-SNAPSHOT.war

- Add SonarQube details:

Jenkins > FarmerAssistance-backend >

General Source Code Management Build Triggers Build Environment Build **Post-build Actions**

Health report amplification factor: 1.0

1% failing tests scores as 99% health. 5% failing tests scores as 95% health

Allow empty results ☐ Do not fail the build on empty test results

**SonarQube analysis with Maven**

The SonarQube Post-build Action is deprecated

Branch:

Optional sonar.branch property.

JDK: (Inherit From Job)

JDK to be used for this SonarQube analysis

Maven Version: (Inherit From Job)

Root POM:

Default is pom.xml

Use private Maven repository ☐

Settings file: Use default maven settings

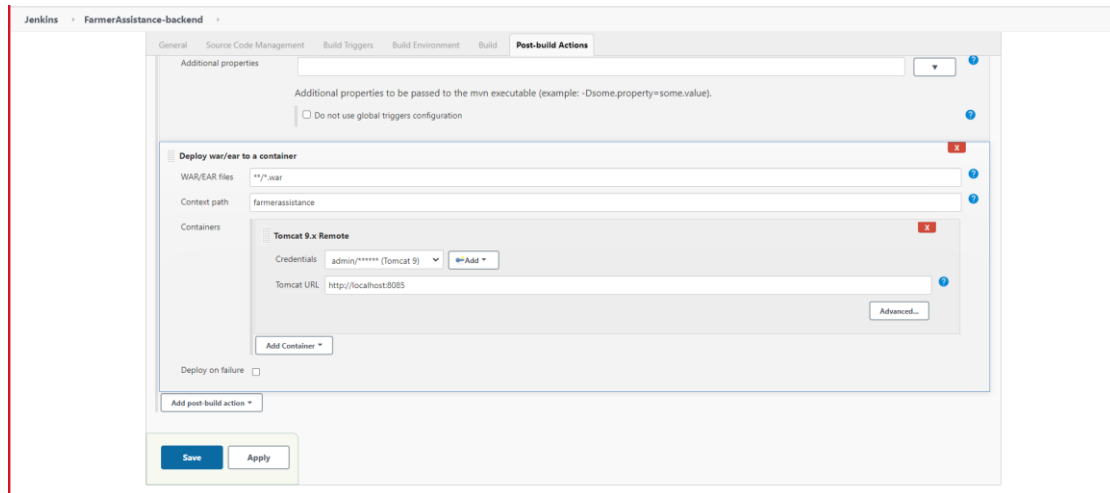
Global Settings file: Use default maven global settings

MAVEN\_OPTS:

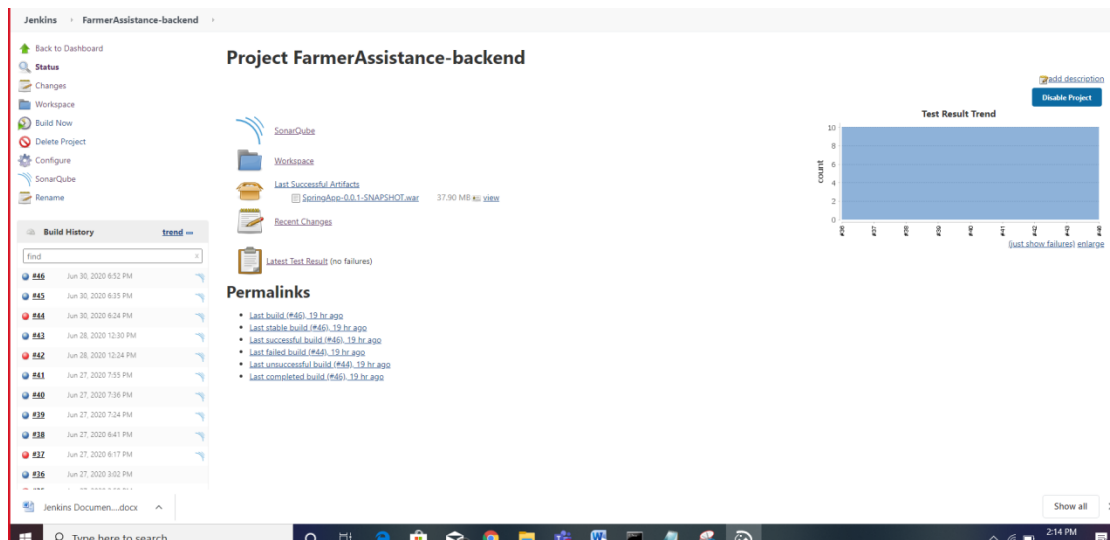
MAVEN\_OPTS env var to provide, if not set the plugin will use the MAVEN\_OPTS defined by the maven builder config.

[Save](#) [Apply](#)

- Deploying the Project:



- Build Project:



- Console Output:

Jenkins

FarmerAssistance-backend

#46

Back to Project

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build #46

Test Result

Previous Build

Console Output

Started by user [admin](#)

Running as SYSTEM

Building in workspace E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant

[FarmingAssistant] \$ cmd.exe /C "mvn -f pom.xml clean package && exit %ERRORLEVEL%"

[INFO] Scanning for projects...

[INFO]

[INFO] -----< com.capspringapp >-----

[INFO] Building SpringApp 0.0.1-SNAPSHOT

[INFO] -----[ war ]-----

[INFO]

[INFO] --- maven-clean-plugin:3.1.0:clean (default-clean) @ SpringApp ---

[INFO] Deleting E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target

[INFO]

[INFO] --- maven-resources-plugin:3.1.0:resources (default-resources) @ SpringApp ---

[INFO] Using "UTF-8" encoding to copy filtered resources.

[INFO] Copying 1 resource

[INFO] Copying 0 resource

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ SpringApp ---

[INFO] Changes detected - recompiling the module!

[INFO] Compiling 38 source files to E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\classes

[INFO]

[INFO] --- maven-resources-plugin:3.1.0:testResources (default-testResources) @ SpringApp ---

[INFO] Using "UTF-8" encoding to copy filtered resources.

[INFO] skip non existing resourceDirectory E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\src\test\resources

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ SpringApp ---

[INFO] Changes detected - recompiling the module!

[INFO] Compiling 2 source files to E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\test-classes

[INFO]

[INFO] --- maven-surefire-plugin:2.22.2:test (default-test) @ SpringApp ---

[INFO]

[INFO] -----

[INFO] T E S T S

[INFO] -----

[INFO] Running com.caggemini.controller.FarmerControllerTest

[INFO] Tests Run: 9, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.997 s - in com.caggemini.controller.FarmerControllerTest

Jenkins

FarmerAssistance-backend

#46

1/1 source files have been analyzed

[INFO] Sensor XML Sensor [xml]

[INFO] Sensor XML Sensor [xml] (done) | time=442ms

[INFO] Sensor Analyzer for "php.ini" files [php]

[INFO] Sensor Analyzer for "php.ini" files [php] (done) | time=0ms

[INFO] Sensor Zero Coverage Sensor

[INFO] Sensor Zero Coverage Sensor (done) | time=184ms

[INFO] Sensor CPD Block Indexer

[INFO] Sensor CPD Block Indexer (done) | time=106ms

[INFO] SCM provider for this project is: git

[INFO] 3 files to be analyzed

[INFO] 0/3 files analyzed

[WARNING] Missing blame information for the following files:

[WARNING] \* pom.xml

[WARNING] \* src/main/java/com/caggemini/SpringAppApplication.java

[WARNING] \* src/test/java/com/caggemini/SpringAppApplicationTests.java

[WARNING] This may lead to missing/broken features in SonarQube

[INFO] 21 files had no CPD blocks

[INFO] Calculating CPD for 17 files

[INFO] CPD calculation finished

[INFO] Analysis report generated in 1074ms, dir size=108 KB

[INFO] Analysis reports compressed in 4529ms, zip size=108 KB

[INFO] Analysis report uploaded in 364ms

[INFO] ANALYSIS SUCCESSFUL, you can browse <http://localhost:9000/dashboard/index/com.capspringapp>

[INFO] Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report

[INFO] More about the report processing at [http://localhost:9000/api/ce/task?id=AMF7y2\\_Kg18Kc18Lm8](http://localhost:9000/api/ce/task?id=AMF7y2_Kg18Kc18Lm8)

[INFO] Task total time: 34.942 s

[INFO] -----

[INFO] BUILD SUCCESS

[INFO] -----

[INFO] Total time: 51.363 s

[INFO] Finished at: 2020-06-30T18:55:15+05:30

[INFO] -----

SonarQube analysis completed: SUCCESS

[DeployPublisher][INFO] Attempting to deploy 1 war file(s)

[DeployPublisher][INFO] Deploying E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\SpringApp-0.0.1-SNAPSHOT.war to container Tomcat 9.x Remote with context Farmerassistance

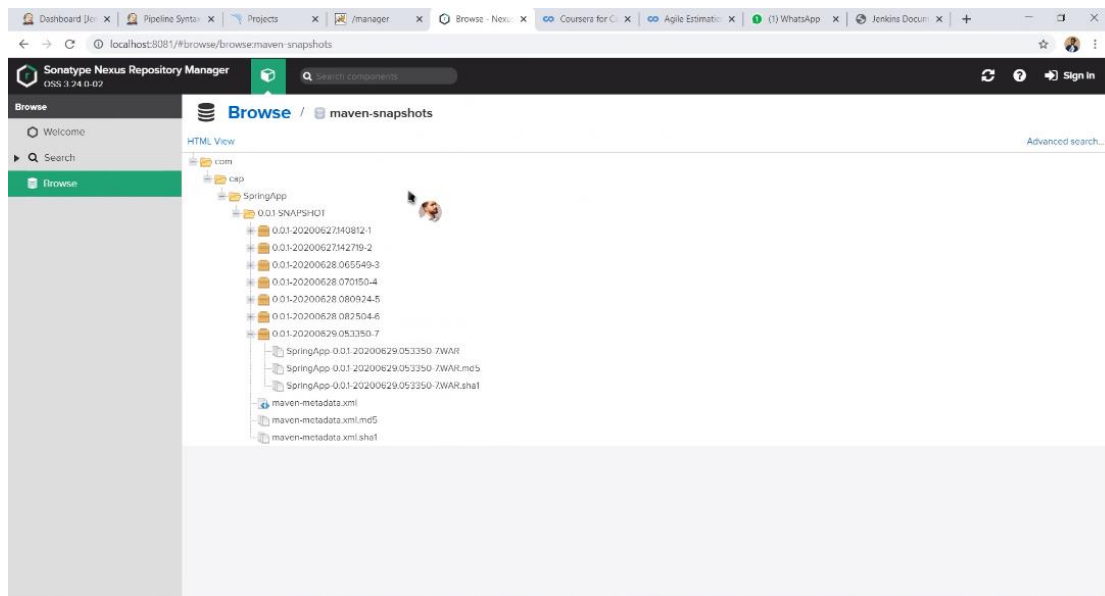
Redeploying [E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\SpringApp-0.0.1-SNAPSHOT.war]

Undeploying [E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\SpringApp-0.0.1-SNAPSHOT.war]

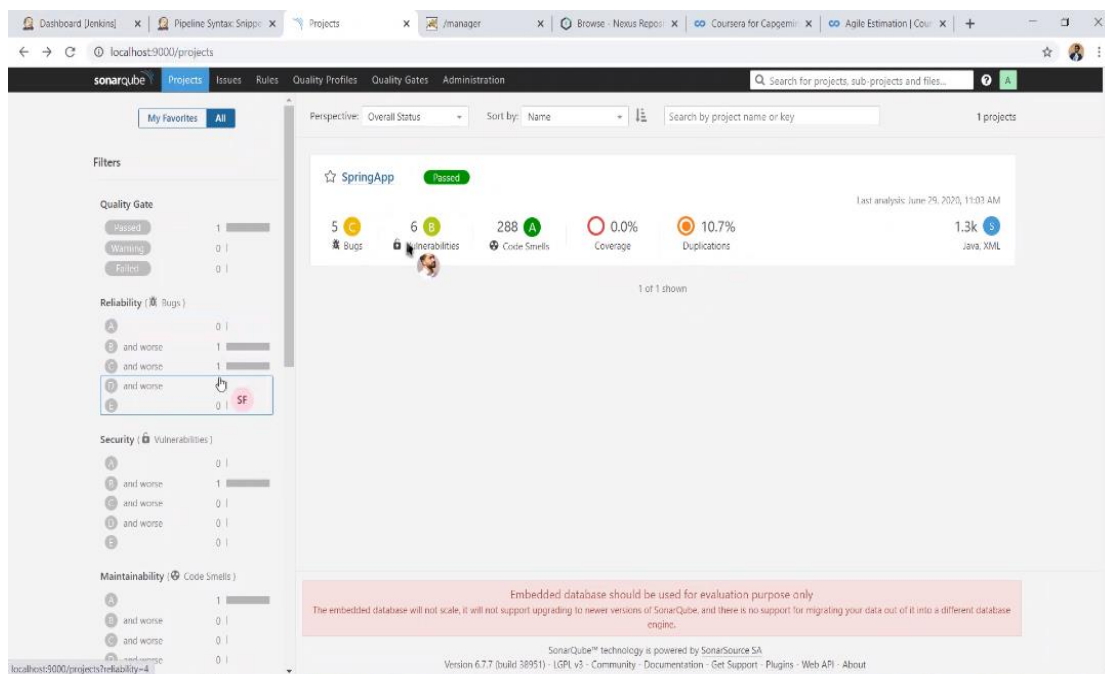
Deploying [E:\I-Farming Assistance\Farming\_Assistance\FarmingAssistant\target\SpringApp-0.0.1-SNAPSHOT.war]

Finished: SUCCESS

- Artifact saved on Nexus Repository:



- SonarQube Code Coverage



- Deploying on Tomcat:

Dashboard | Pipeline Syntax | Projects | /manager | Browse - No... | Courses for C... | Agile Estimatio... | (1) WhatsApp | Jenkins Docu... | +

localhost:8085/manager/html/list

## Tomcat Web Application Manager

Message: OK

**Manager**

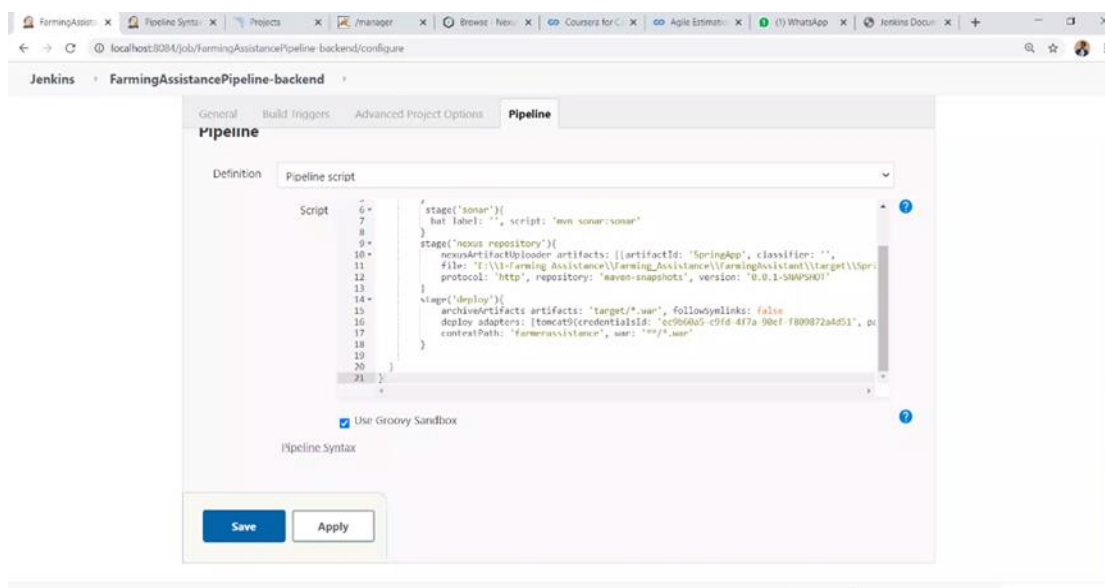
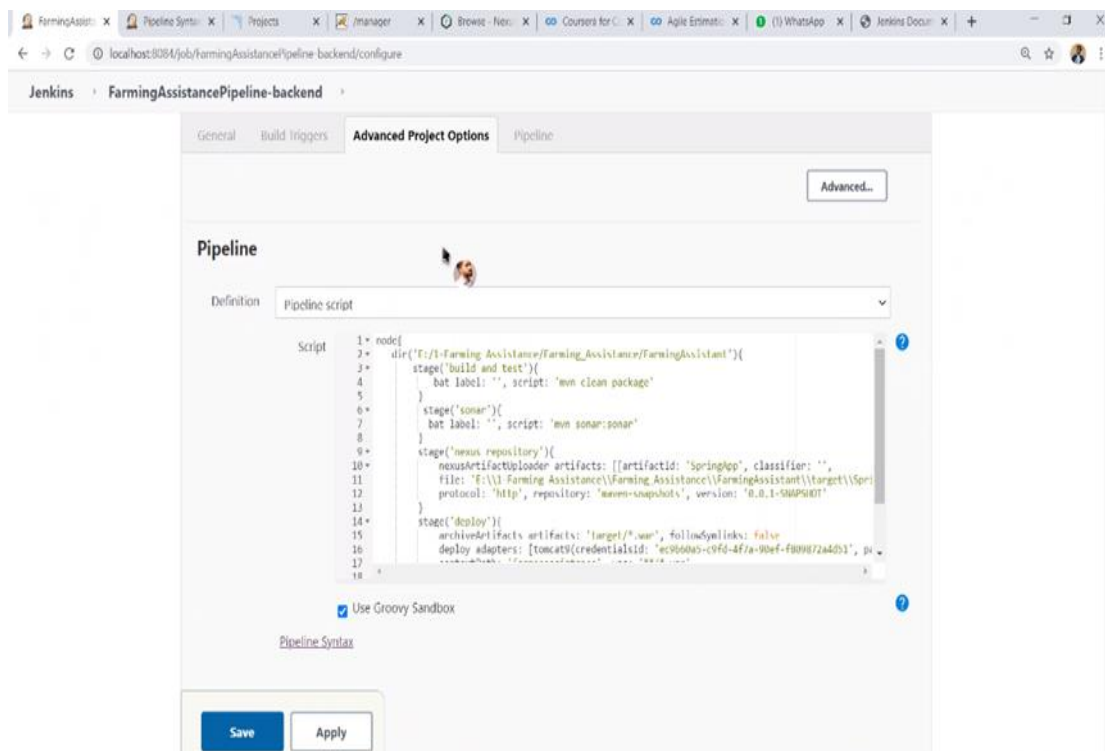
[List Applications](#) | [HTML Manager Help](#) | [Manager Help](#) | [Server Status](#)

**Applications**

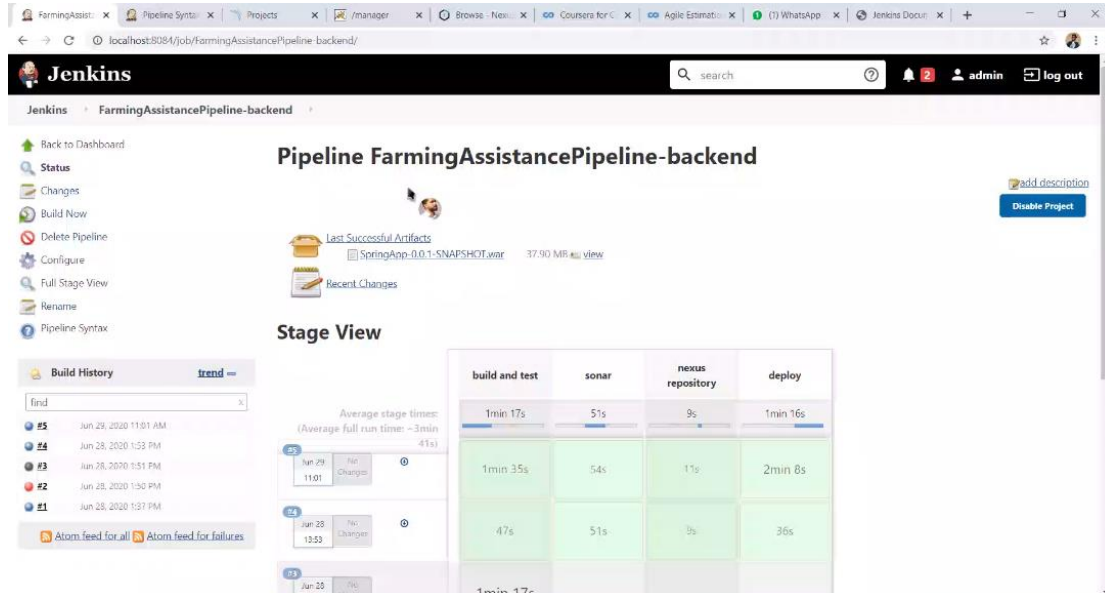
Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/FarmAssist	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/FarmerAssistance-backend	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/farmerassistance	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

## Step 8: Create a Pipeline Project :

- Select new item.
- Select pipeline project.
- Click on OK.
- Click on Configure and generate the pipeline script.



- Output with Pipeline:



- Console Output:

The image shows the Jenkins console output for the 'FarmingAssistancePipeline-backend' pipeline. The output displays the build details, including the artifact 'SpringApp-0.0.1-SNAPSHOT.war' and the stage 'deploy'.

```

Type: WAR
Version: 0.0.1-SNAPSHOT
File: SpringApp-0.0.1-SNAPSHOT.war
Repository: maven-snapshots
Downloading: http://localhost:8081/repository/maven-snapshots/com/cap/SpringApp/0.0.1-SNAPSHOT/maven-metadata.xml
100 % completed (593 B / 593 B)
Downloaded: http://localhost:8081/repository/maven-snapshots/com/cap/SpringApp/0.0.1-SNAPSHOT/maven-metadata.xml (593 B at 289 B/s)
Uploading: http://localhost:8081/repository/maven-snapshots/com/cap/SpringApp/0.0.1-SNAPSHOT/SpringApp-0.0.1-20200628-053350-7.war
Uploading: http://localhost:8081/repository/maven-snapshots/com/cap/SpringApp/0.0.1-SNAPSHOT/SpringApp-0.0.1-20200628-053350-7.war (40 MB at 11 MB/s)
Uploading: http://localhost:8081/repository/maven-snapshots/com/cap/SpringApp/0.0.1-SNAPSHOT/maven-metadata.xml
Uploading: http://localhost:8081/repository/maven-snapshots/com/cap/SpringApp/0.0.1-SNAPSHOT/maven-metadata.xml (593 B at 455 B/s)
Uploading artifact SpringApp-0.0.1-SNAPSHOT.war completed.
[Pipeline]
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (deploy)
[Pipeline] archiveArtifacts
[Pipeline] deploy
[DeployPublisher][INFO] Attempting to deploy 1 war file(s)
[DeployPublisher][INFO] Deploying E:\Farming Assistance\Farming Assistant\target\SpringApp-0.0.1-SNAPSHOT.war to container Tomcat 9.x
Remote with context FarmingAssistance
  Redeploying [E:\Farming Assistance\Farming Assistant\Farming Assistant\target\SpringApp-0.0.1-SNAPSHOT.war]
  Undeploying [E:\Farming Assistance\Farming Assistant\Farming Assistant\target\SpringApp-0.0.1-SNAPSHOT.war]
  Deploying [E:\Farming Assistance\Farming Assistant\Farming Assistant\target\SpringApp-0.0.1-SNAPSHOT.war]
[Pipeline]
[Pipeline] // stage
[Pipeline]
[Pipeline] // dir
[Pipeline]
[Pipeline] // node
[Pipeline] end of Pipeline
Finished: SUCCESS
  
```

The console output also includes a footer with the page generation date and time: 'Page generated: Jun 28, 2020 12:05:49 PM (S)'.

**THANK YOU**