

## Experiment 5 : Job Pipeline - Jenkins

### Aim :

To Build the pipeline of jobs using Maven /Gradle /Ant in Jenkins,create a pipeline script to Test and deploy an application over the tomcat server.

### Theory :

**Jenkins** is an open-source automation server used to implement **Continuous Integration (CI)** and **Continuous Deployment (CD)** in software development. It helps automate tasks like building, testing, and deploying code, improving efficiency and reducing human errors.

### **Key Concepts:**

1. **Automated Builds:** Jenkins automatically compiles code whenever changes are made, ensuring that the software is always in a buildable state.
2. **Continuous Integration:** Developers frequently commit code to a shared repository. Jenkins automatically triggers builds and runs tests to detect issues early.
3. **Pipelines:** Jenkins workflows are defined using **Pipelines** in a **Jenkinsfile**, which can be scripted or declarative.
4. **Plugins:** Jenkins supports plugins for version control (Git), build tools (Maven, Gradle), deployment (Docker, Kubernetes), and more.
5. **Freestyle Projects vs. Pipelines:**
  - **Freestyle Projects:** Simple, GUI-based jobs for basic automation.
  - **Pipelines:** Code-defined workflows for complex CI/CD tasks.

## Example of a Simple Jenkins Pipeline (Declarative):

```
pipeline {
  agent any
  stages {
    stage('Build') {
      steps {
        sh 'echo "Building the project"'
      }
    }
    stage('Test') {
      steps {
        sh 'echo "Running tests"'
      }
    }
    stage('Deploy') {
      steps {
        sh 'echo "Deploying the application"'
      }
    }
  }
}
```

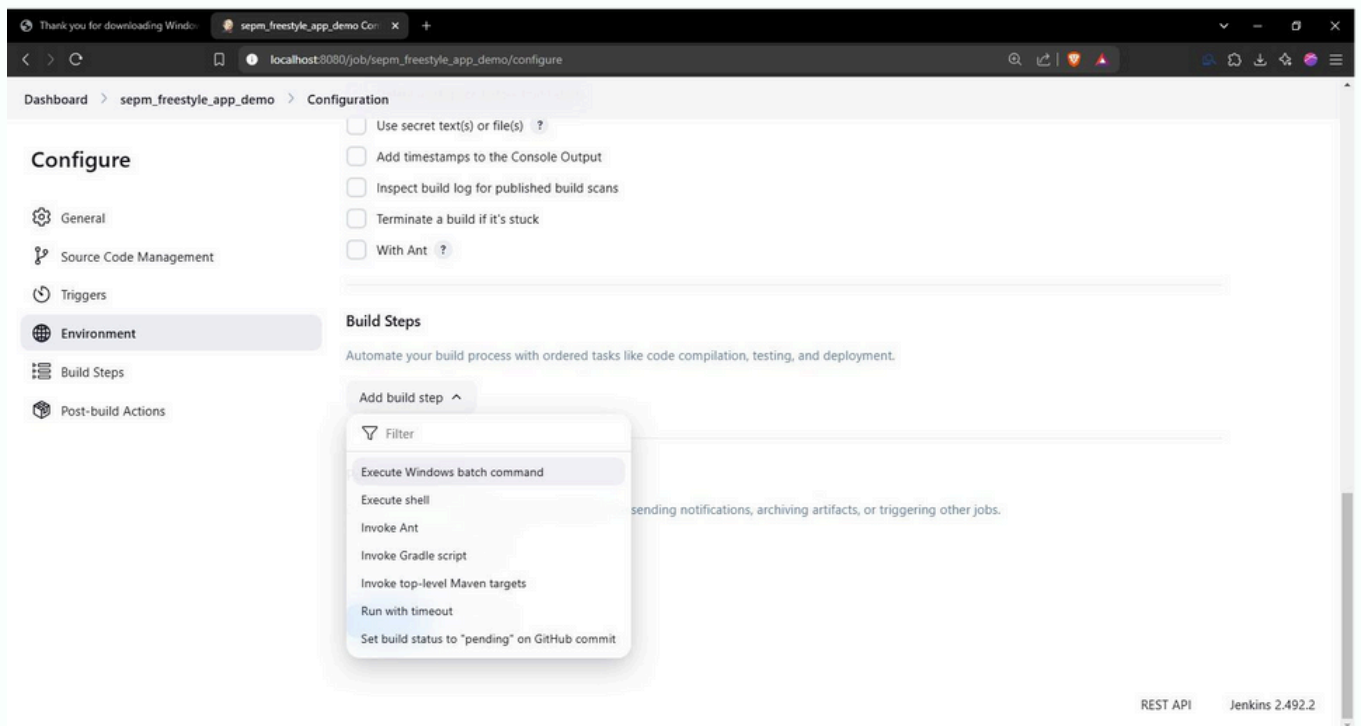
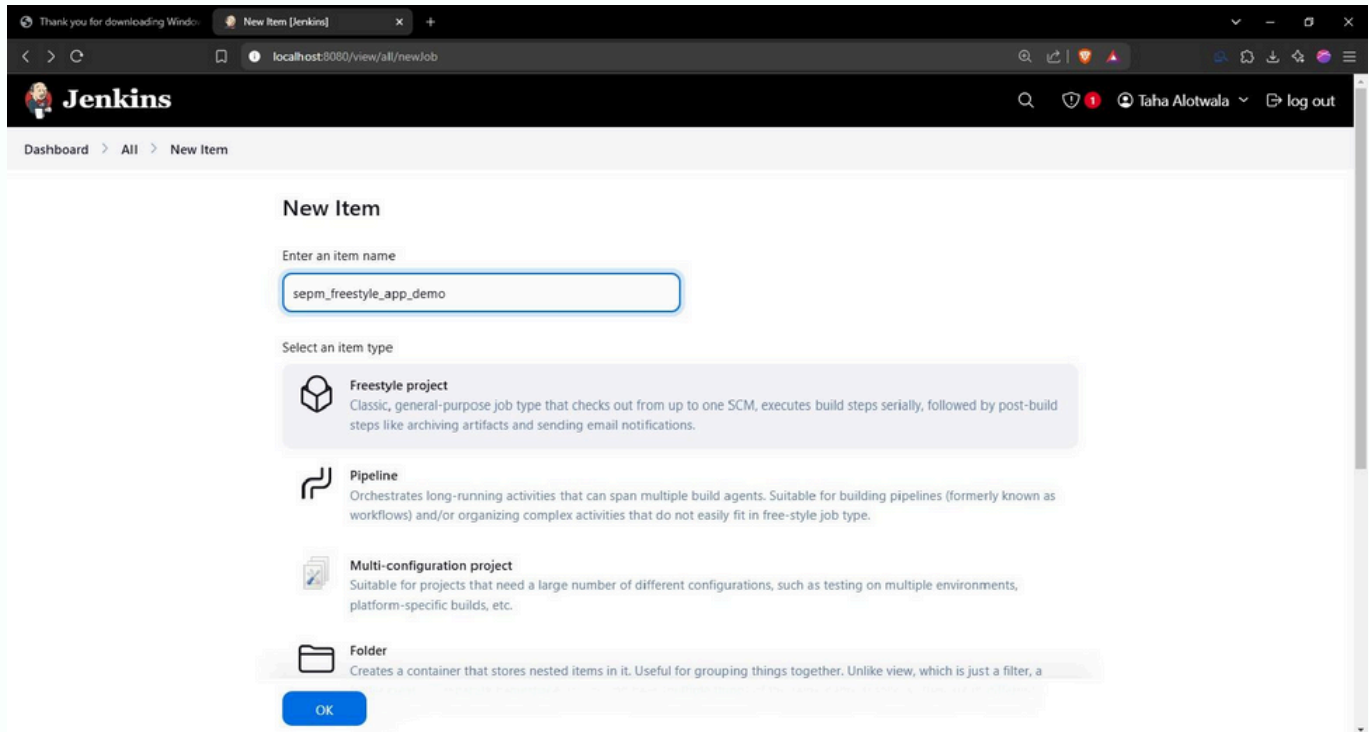
This pipeline defines three stages: **Build**, **Test**, and **Deploy**, each with its own commands.

### Benefits of Jenkins in Programming:

- Automates repetitive tasks (builds, tests, deployments).
- Detects bugs early with continuous testing.
- Speeds up the development lifecycle.

# Output :

## 1. Freestyle App



Thank you for downloading Windows  
sepm\_freestyle\_app\_demo Con x +

localhost:8080/job/sepm\_freestyle\_app\_demo/configure

Dashboard > sepm\_freestyle\_app\_demo > Configuration

### Configure

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

☐ Use secret text(s) or file(s) ?  
☐ Add timestamps to the Console Output  
☐ Inspect build log for published build scans  
☐ Terminate a build if it's stuck  
☐ With Ant ?

### Build Steps

Automate your build process with ordered tasks like code compilation, testing, and deployment.

Execute Windows batch command ?

Command  
See the list of available environment variables  

```
net stats workstation | find "Statistics since"
```

Advanced ▾

Save Apply

Thank you for downloading Windows  
sepm\_freestyle\_app\_demo #1 x +

localhost:8080/job/sepm\_freestyle\_app\_demo/1/

Jenkins

Dashboard > sepm\_freestyle\_app\_demo > #1

Status

Changes

Console Output

Edit Build Information

Delete build '#1'

Timings

✓ #1 (Apr 2, 2025, 11:43:13 AM)

Add description Keep this build forever

Started by user [Taha Alotwala](#)

Started 4.9 sec ago  
Took 0.37 sec

This run spent:

- 12 ms waiting;
- 0.37 sec build duration;
- 0.38 sec total from scheduled to completion.

</> No changes.

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Thank you for downloading Windows

sepm\_freestyle\_app\_demo #1

localhost:8080/job/sepm\_freestyle\_app\_demo/1/console

# Jenkins

Taha Alotwala log out

Dashboard > sepm\_freestyle\_app\_demo > #1 > Console Output

- Status
- Changes
- Console Output
- Edit Build Information
- Delete build '#1'
- Timings

## Console Output

Download Copy View as plain text

```
Started by user Taha Alotwala
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\.jenkins\workspace\sepm_freestyle_app_demo
[sepm_freestyle_app_demo] $ cmd /c call C:\Windows\TEMP\jenkins10778809563619165675.bat

C:\ProgramData\Jenkins\.jenkins\workspace\sepm_freestyle_app_demo>net stats workstation | find "Statistics since"
Statistics since 13-03-2025 04:33:05

C:\ProgramData\Jenkins\.jenkins\workspace\sepm_freestyle_app_demo>exit 0
Finished: SUCCESS
```

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## 2. Taking Parameters

script :

```
MSYS:/d/MiscRepos/sepm_lab
```

```
1 @echo off
2 echo "Hello %1... Your address is %2"
```

```
example1.cmd[+] [unix] (05:29 01/01/1970) 2,38 All
-- INSERT --
```

## Executing the script (unsuccessful) :

```
Command Prompt
Microsoft Windows [Version 10.0.19045.5608]
(c) Microsoft Corporation. All rights reserved.

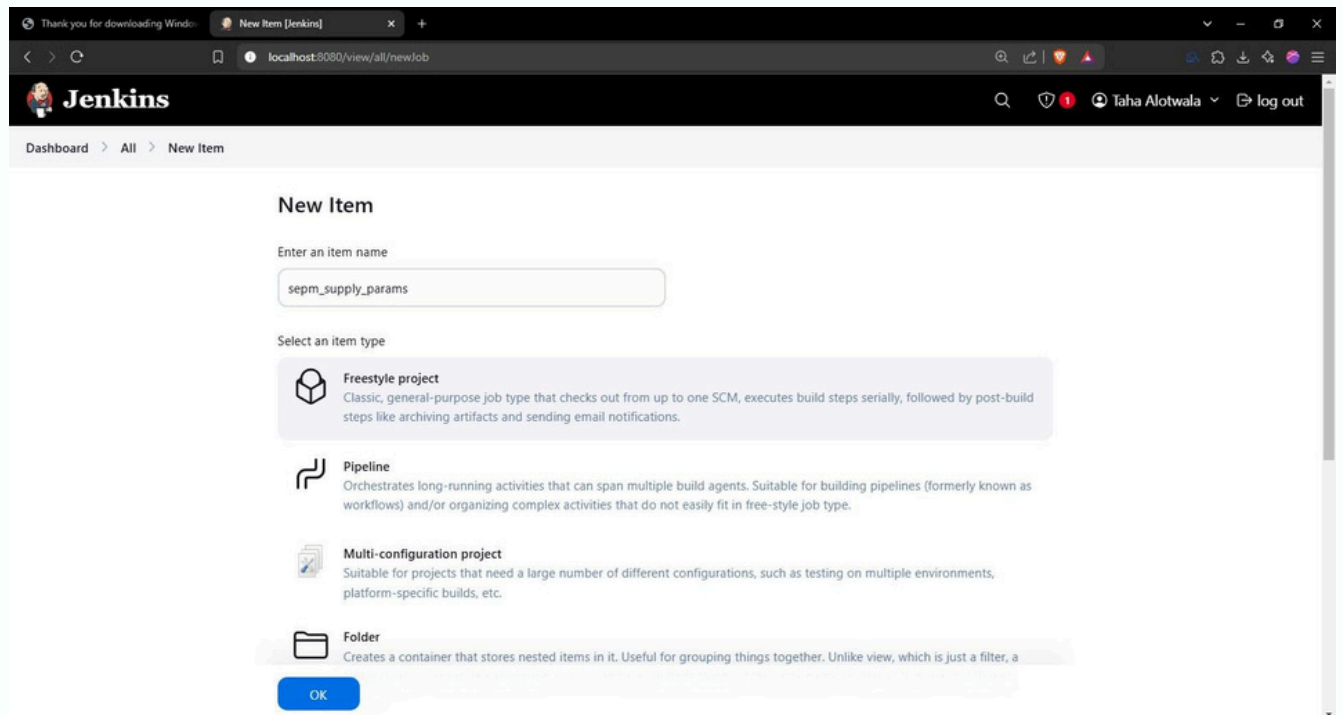
C:\Users\Admin>cd "D:\MiscRepos\sepm_lab\files"

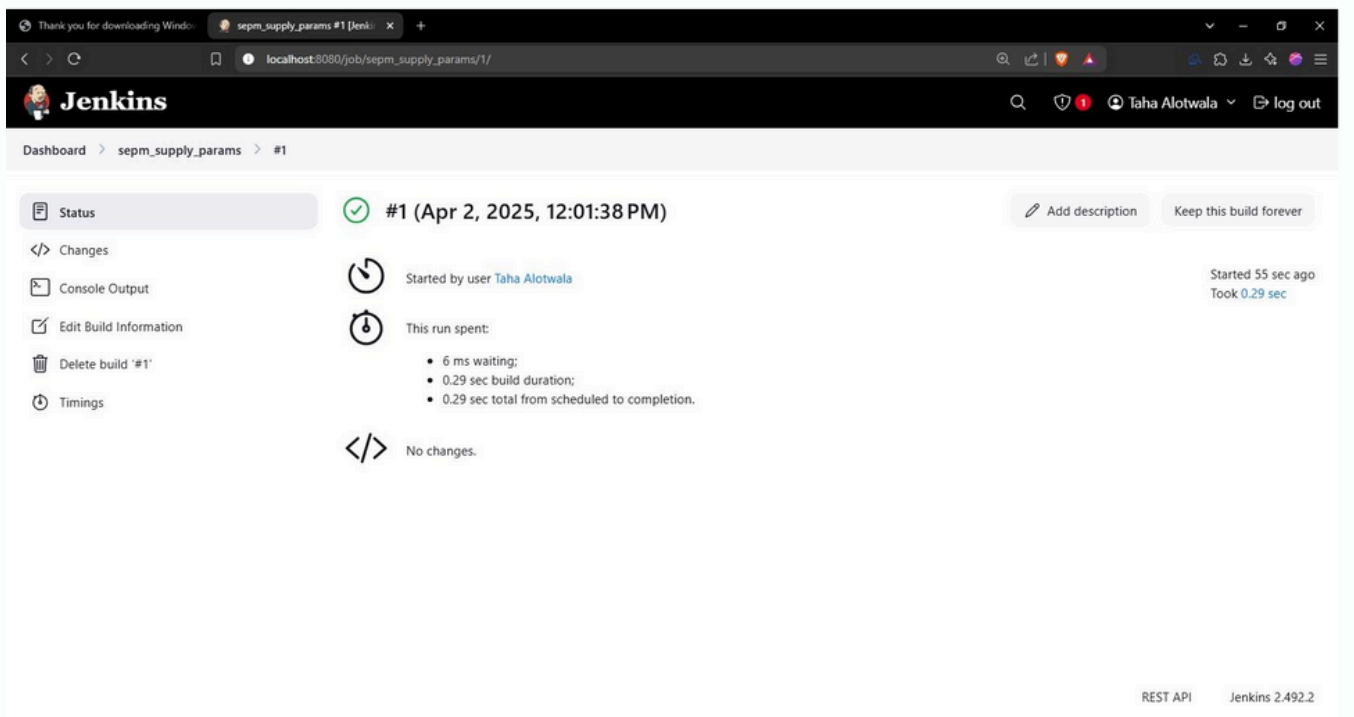
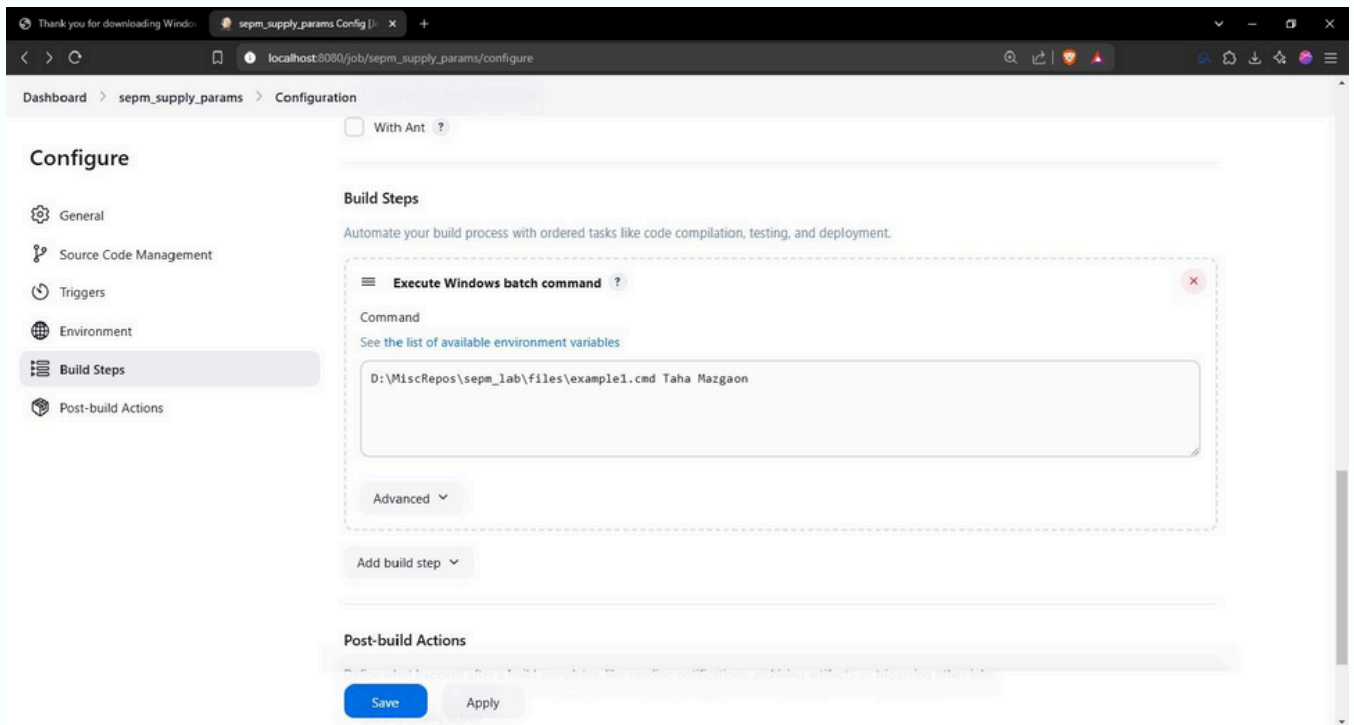
C:\Users\Admin>example1.cmd
'example1.cmd' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Admin>example1.cmd Taha
'example1.cmd' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Admin>
```

## Configure Jenkins :





The screenshot shows the Jenkins web interface in a browser. The address bar indicates the URL is `localhost:8080/job/sepm_supply_params/1/console`. The page title is "Jenkins". The breadcrumb navigation shows "Dashboard > sepm\_supply\_params > #1 > Console Output". On the left sidebar, there are links for "Status", "Changes", "Console Output" (which is selected), "Edit Build Information", "Delete build '#1'", and "Timings". The main content area is titled "Console Output" with a green checkmark icon. It contains the following text: "Started by user [Taha Alotwala](#)", "Running as SYSTEM", "Building in workspace C:\ProgramData\Jenkins\jenkins\workspace\sepm\_supply\_params", "[sepm\_supply\_params] \$ cmd /c call C:\Windows\TEMP\jenkins15807160200406300302.bat", "C:\ProgramData\Jenkins\jenkins\workspace\sepm\_supply\_params>D:\MiscRepos\sepm\_lab\files\example1.cmd Taha Mazgaon", "Hello Taha... Your address is Mazgaon", and "Finished: SUCCESS". On the right side of the console output, there are buttons for "Download", "Copy", and "View as plain text". At the bottom right of the page, it says "REST API" and "Jenkins 2.492.2".

### 3. Running a Java Program

The code :

The screenshot shows a code editor with a file named `vi JavaInJenkins.java`. The code is as follows:

```
6 class JavaInJenkins
5 {
4     public static void main(String[] args)
3     {
2         System.out.println("Hello, from the java file");
1     }
7 }
```



Running the file through the terminal :

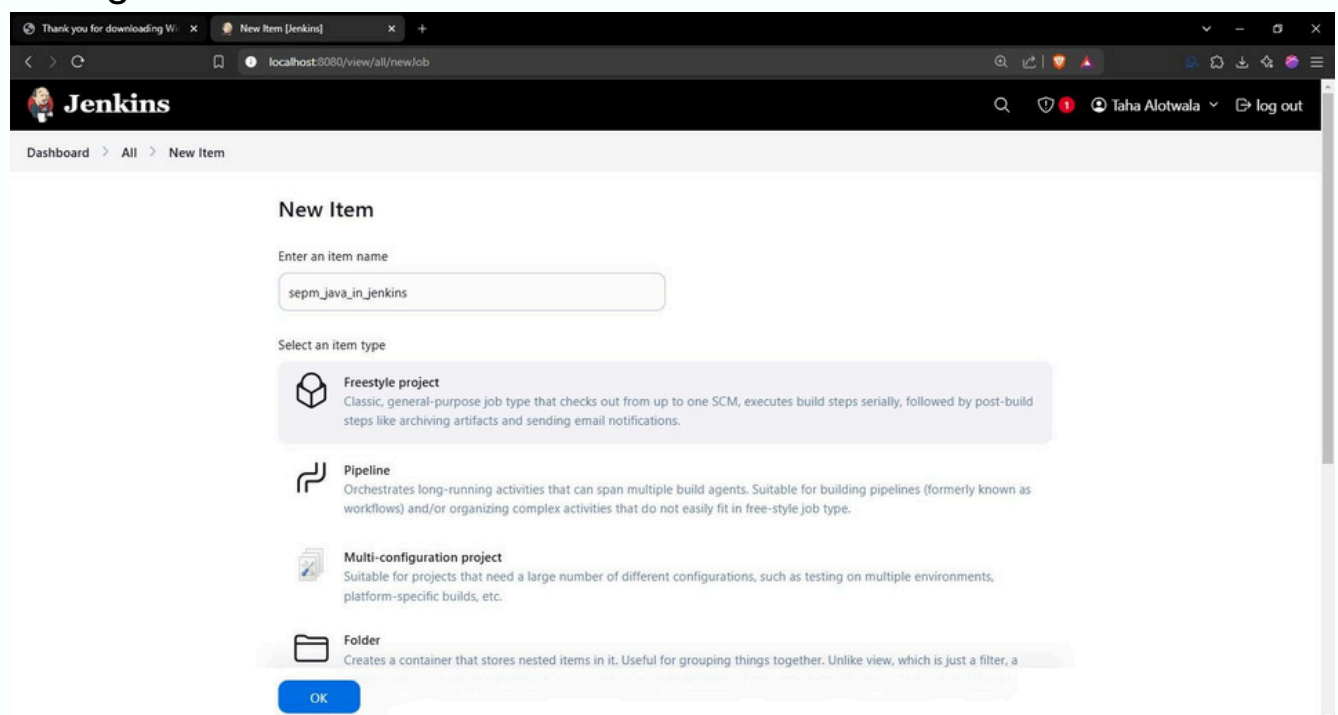
```
/d/MiscRepos/sepm_lab/files git:(master)±5 (5.232s)
vi JavaInJenkins.java

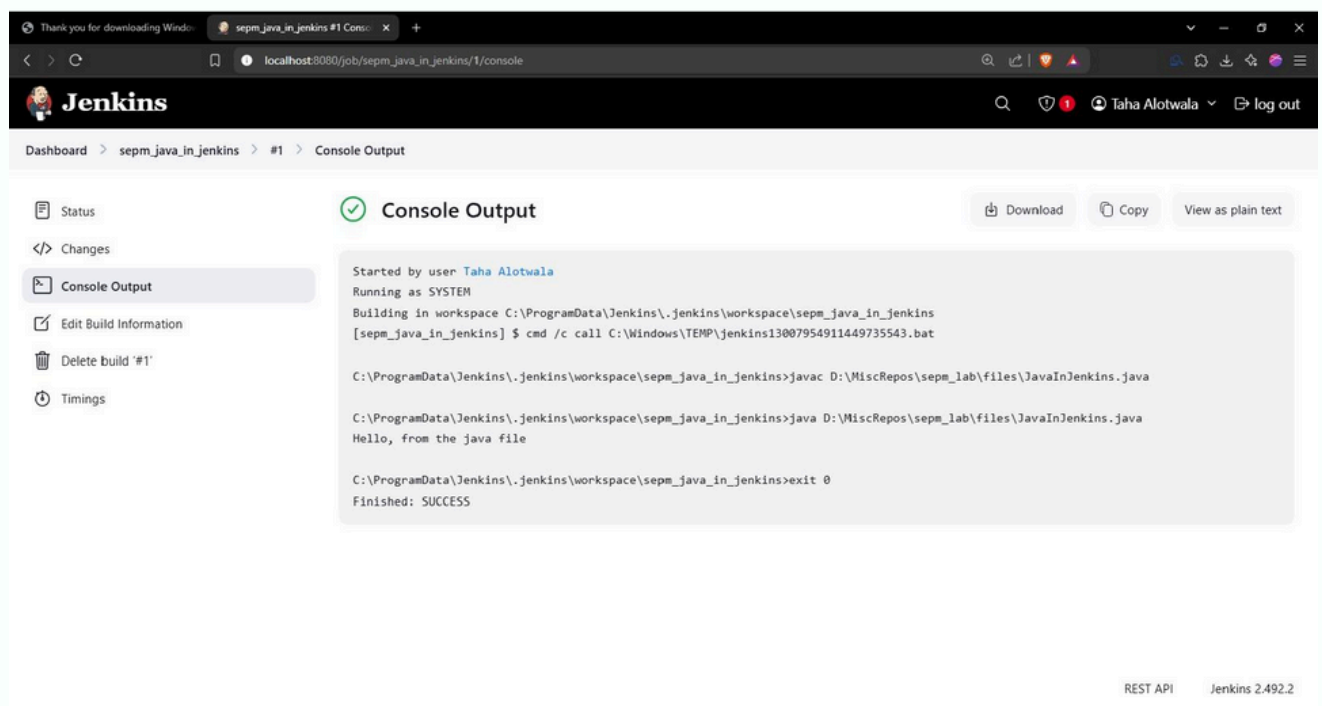
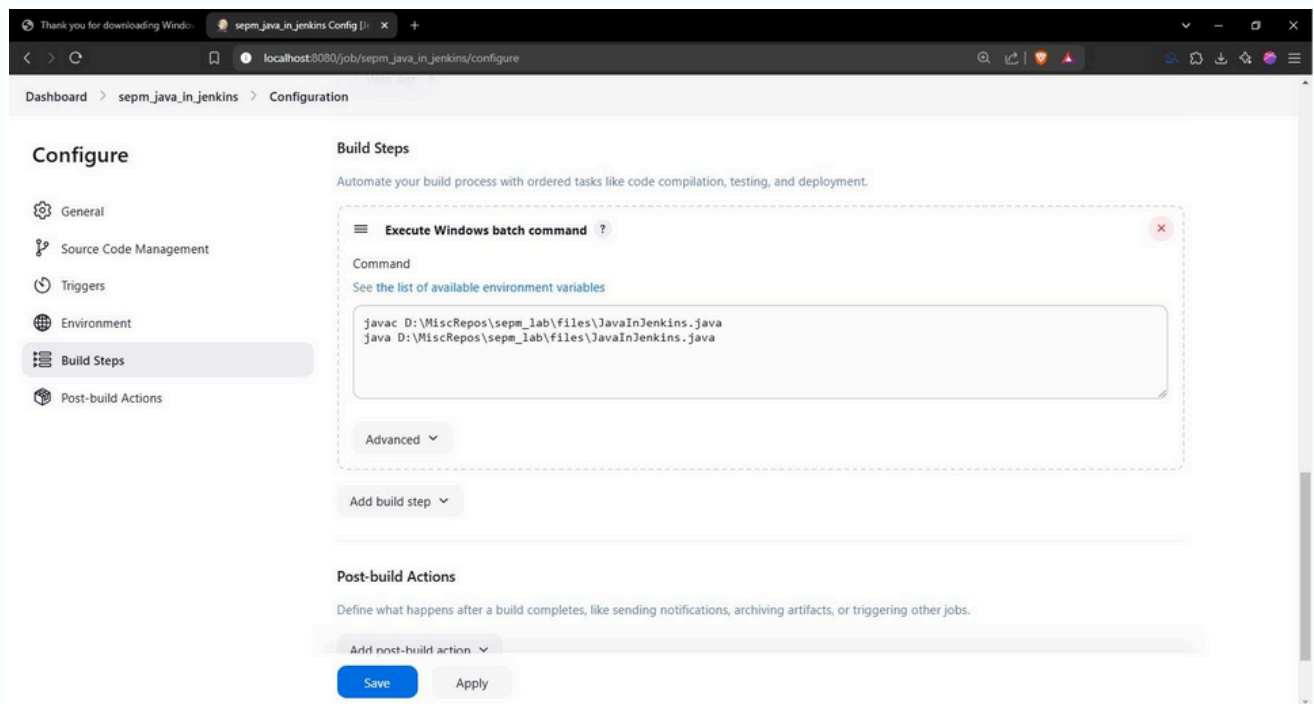
/d/MiscRepos/sepm_lab/files git:(master)±5 (1.298s)
javac JavaInJenkins.java

/d/MiscRepos/sepm_lab/files git:(master)±5 (1.296s)
java JavaInJenkins.java
Hello, from the java file

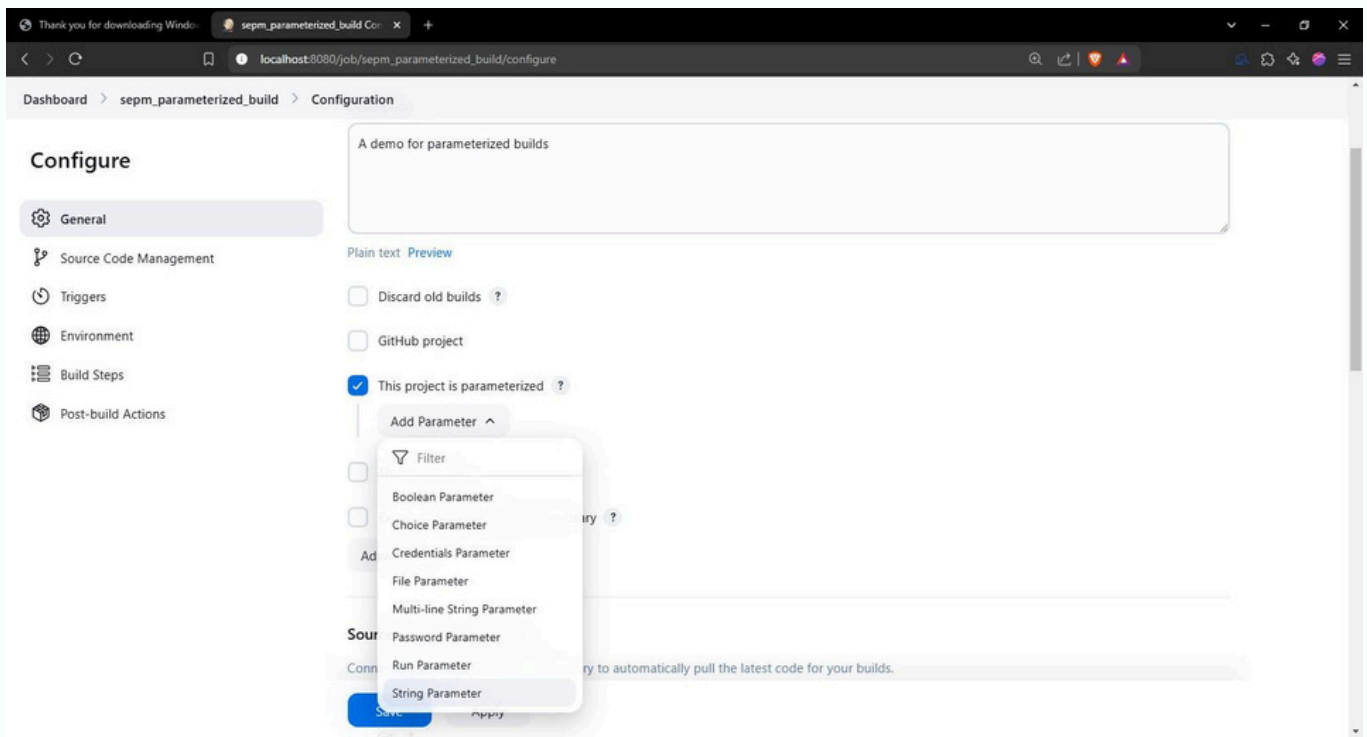
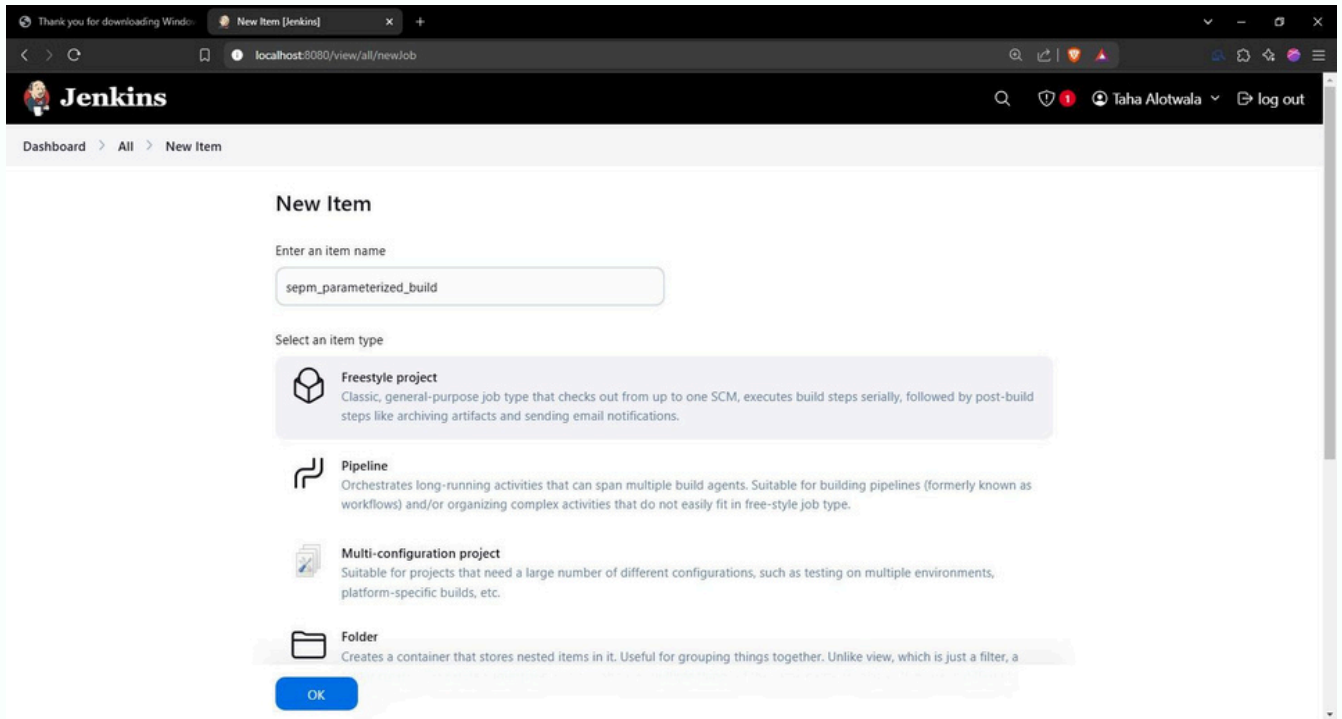
/d/MiscRepos/sepm_lab/files git:(master)✓ ±5
|
```

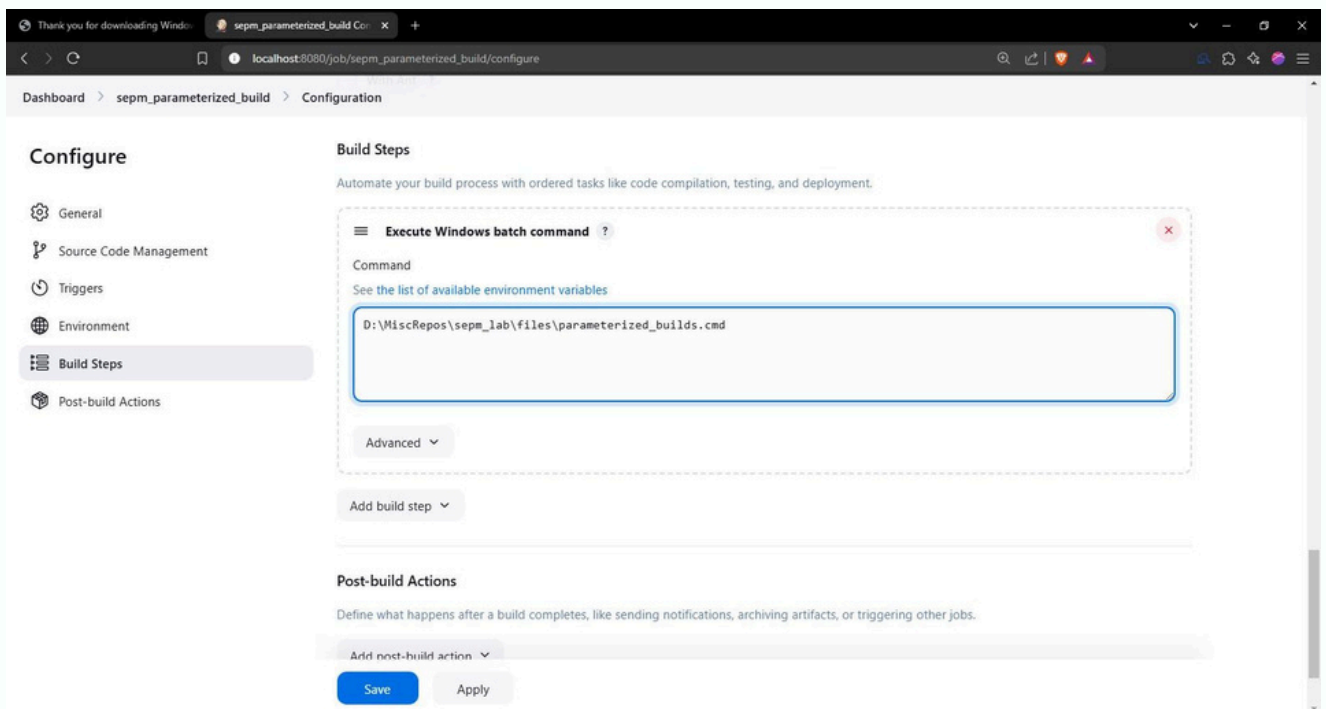
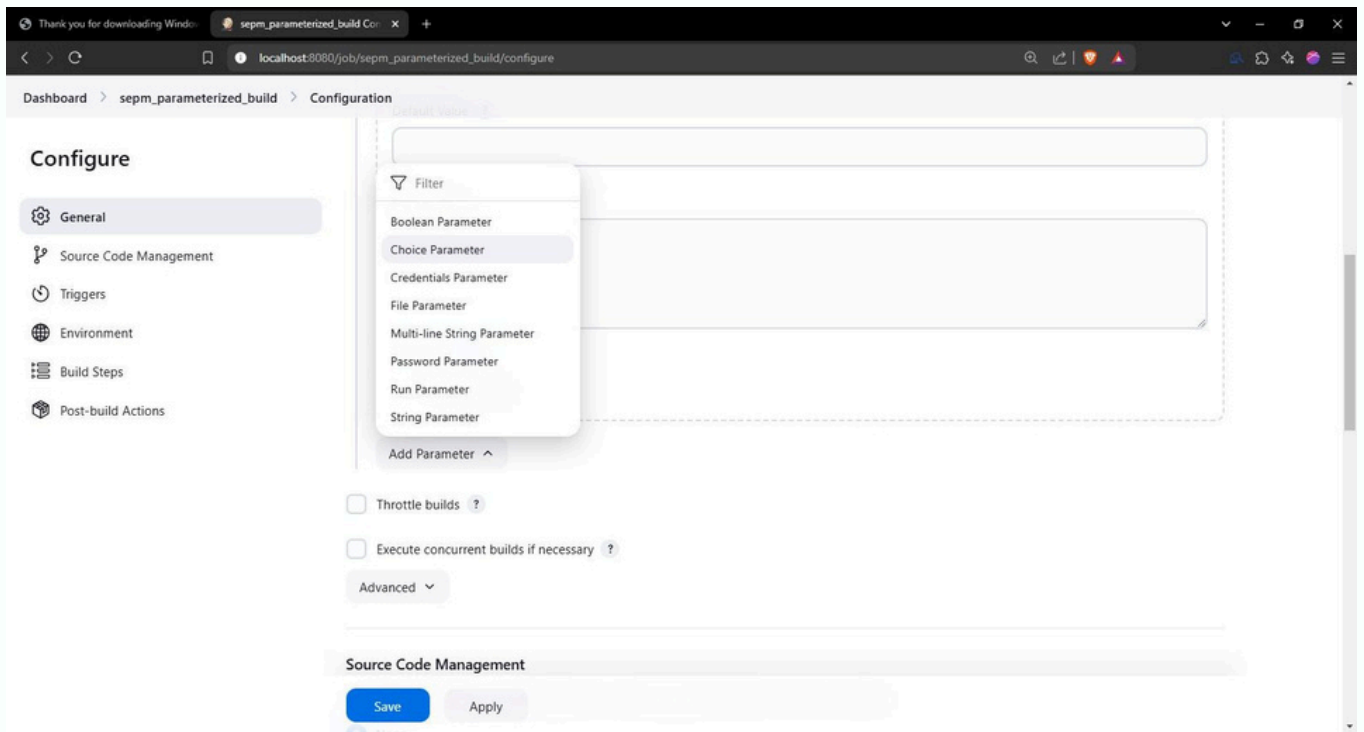
Configure Jenkins :





## 4. Parameterized Builds





Thank you for downloading Windows Jenkins

localhost:8080/job/sepm\_parameterized\_build/build?delay=0sec

# Jenkins

Taha Alotwala log out

Dashboard > sepm\_parameterized\_build

- Status
- Changes
- Workspace
- Build with Parameters
- Configure
- Delete Project
- Rename

## Project sepm\_parameterized\_build

This build requires parameters:

name  
Taha

city  
Mumbai

Build Cancel

Builds  
No builds

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```
.. parameterized_builds.cmd
1 @echo off
2 echo "Hello your name is : %name%, and your city is %city%."
```

Thank you for downloading Windows sepm\_parameterized\_build #2

localhost:8080/job/sepm\_parameterized\_build/2/console

# Jenkins

Taha Alotwala log out

Dashboard > sepm\_parameterized\_build > #2 > Console Output

- Status
- Changes
- Console Output
- Edit Build Information
- Delete build '#2'
- Parameters
- Timings
- Previous Build

## Console Output

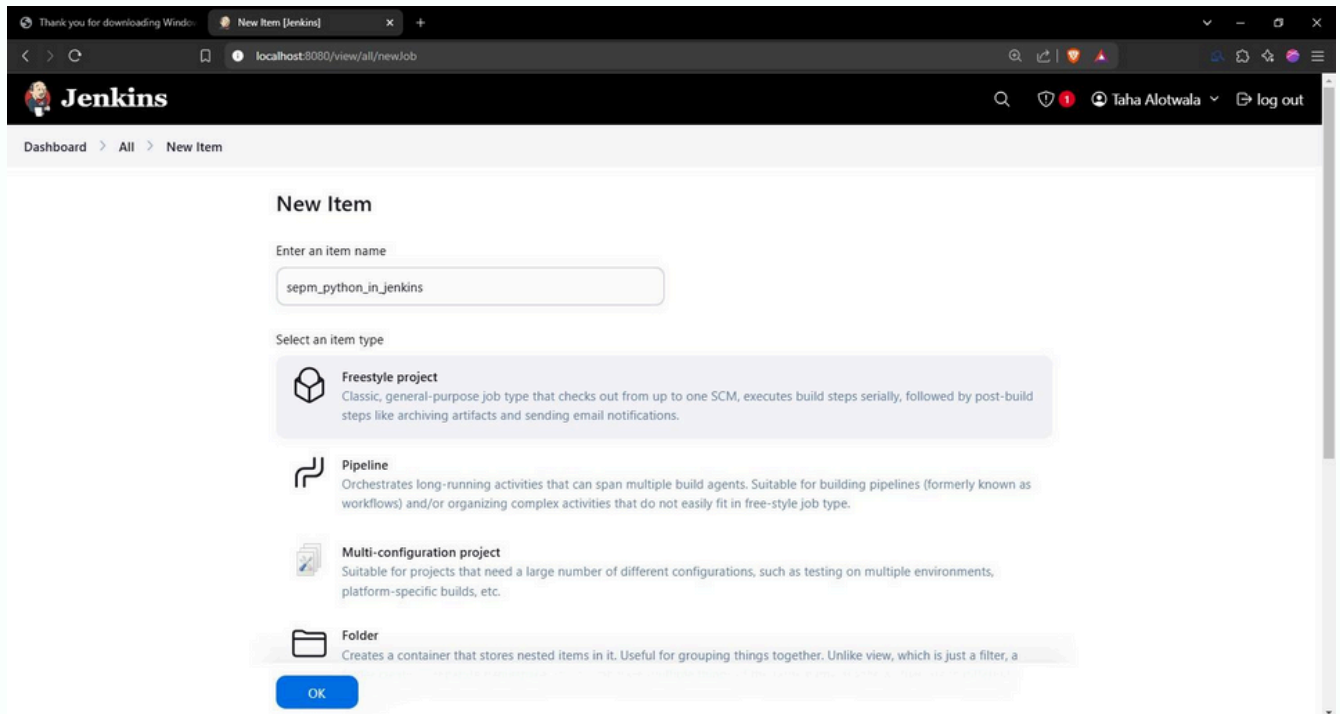
Download Copy View as plain text

```
Started by user Taha Alotwala
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\jenkins\workspace\sepm_parameterized_build
[sepm_parameterized_build] $ cmd /c call C:\Windows\TEMP\jenkins2249229840313057984.bat

C:\ProgramData\Jenkins\jenkins\workspace\sepm_parameterized_build>D:\MiscRepos\sepm_lab\files\parameterized_builds.cmd
"Hello your name is : Taha, and your city is Mumbai."
Finished: SUCCESS
```

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## 5. Running a python script



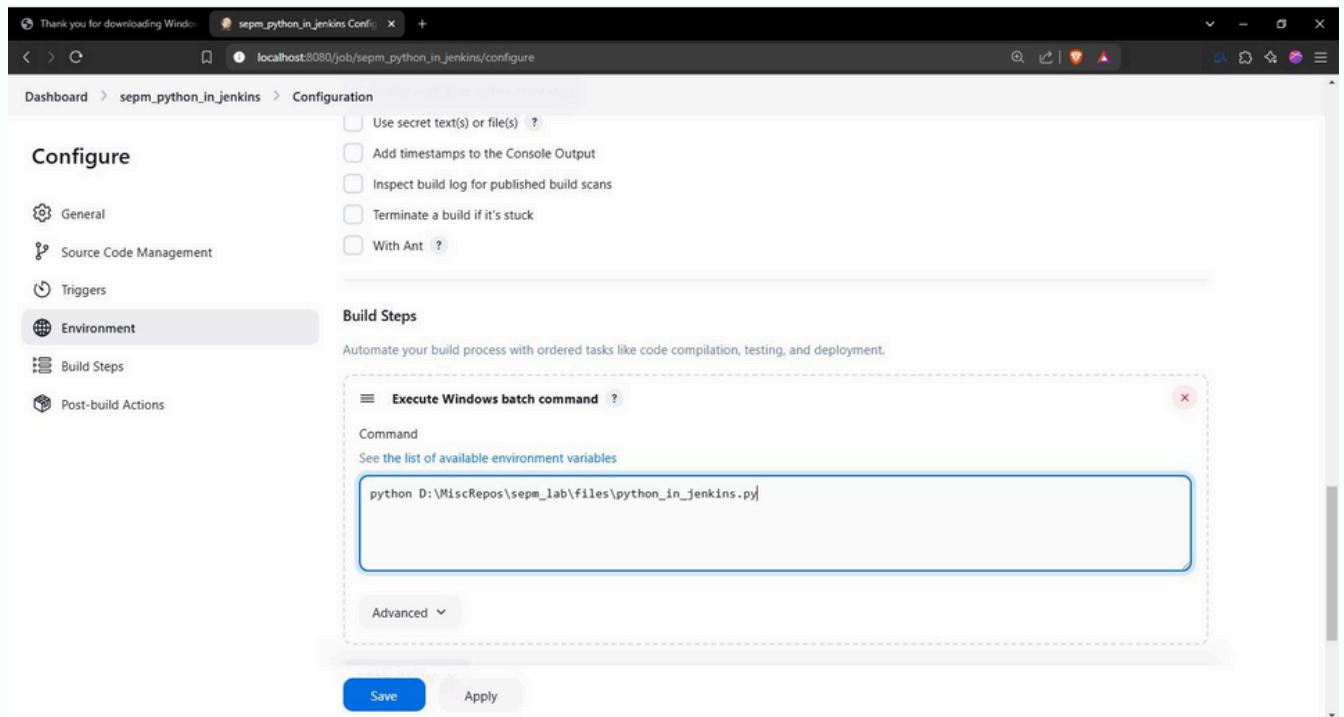
```
vi python_in_jenkins.py
8 import sys
7
6 num = int(sys.argv[1])
5
4 print(f"Original number is : {num}")
3 print(f"Binary representation of {num} is : {bin(num)}")
2 print(f"Octal representation of {num} is : {oct(num)}")
1 print(f"Hexadecimal representation of {num} is : {hex(num)}")
9 print(f"Complex representation of {num} is : {complex(num)}")
python_in_jenkins.py[+] [unix] (05:29 01/01/1970) 9,61 All
```

```
../MiscRepos/sepm_lab/files + v
Share 🔍 - □ ×

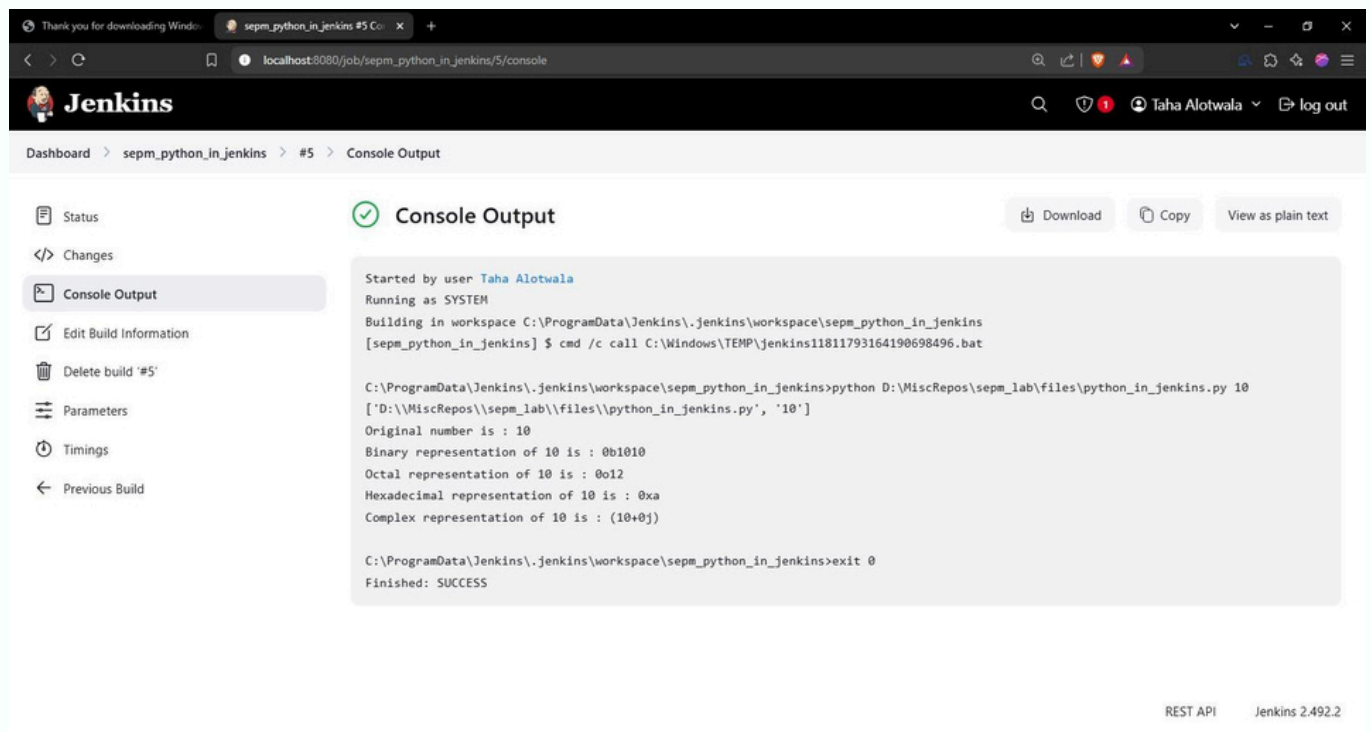
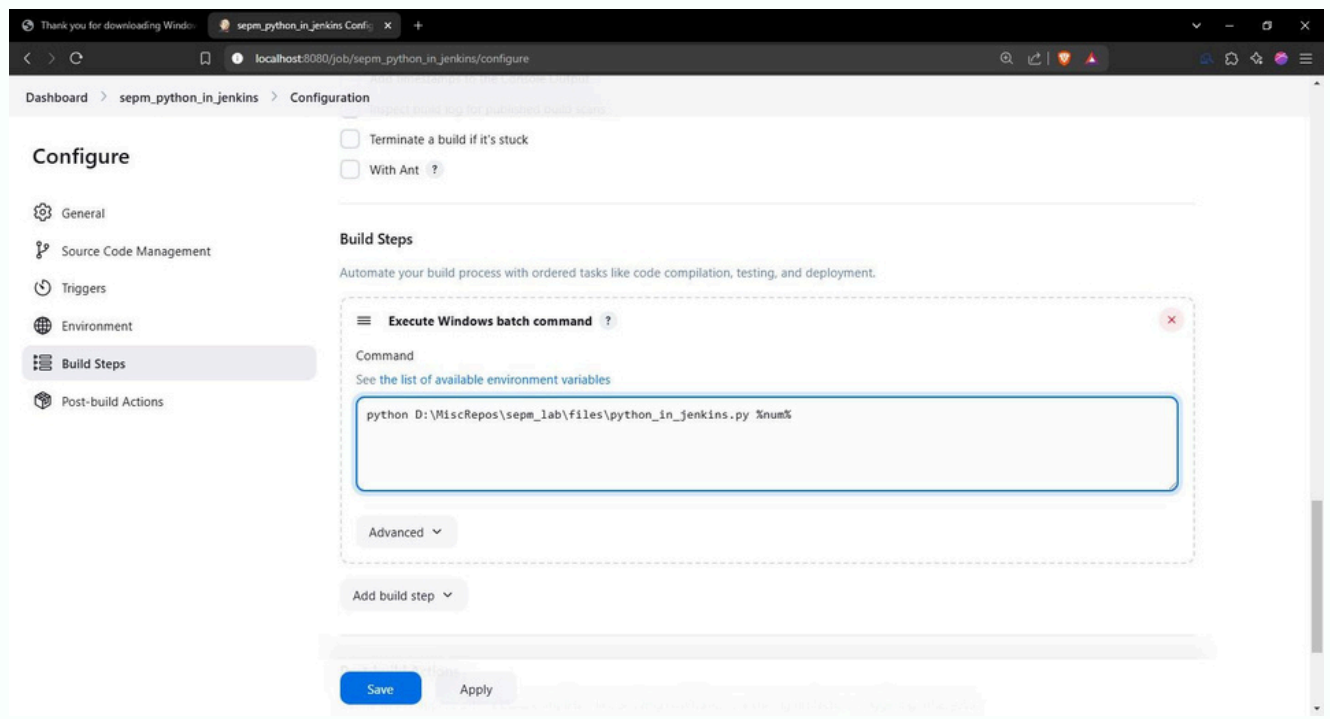
/d/MiscRepos/sepm_lab/files git:(master)±5 (4m 5.85s)
vi python_in_jenkins.py

/d/MiscRepos/sepm_lab/files git:(master)±5 (0.612s)
python python_in_jenkins.py 10
Original number is : 10
Binary representation of 10 is : 0b1010
Octal representation of 10 is : 0o12
Hexadecimal representation of 10 is : 0xa
Complex representation of 10 is : (10+0j)

/d/MiscRepos/sepm_lab/files git:(master) v ±5
```







## Conclusion :

Thus, we have successfully studied Continuous Integration and installed, configured, and understood programming with Jenkins.