Software Engineering & Project Management Lab Experiment No: - 05

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:

Programming in Jenkins:

Continuous Integration is a software development practice where members of a team integrate their work frequently, usually each person integrates at least daily leading to multiple integrations per day. Each integration is verified by an automated build (including test) to detect integration errors as quickly as possible." In simple way, Continuous integration (CI) is the practice of frequently building and testing each change done to your code automatically.

Jenkins is a self-contained, open-source automation server which can be used to automate all sorts of tasks related to building, testing, and delivering or deploying software.

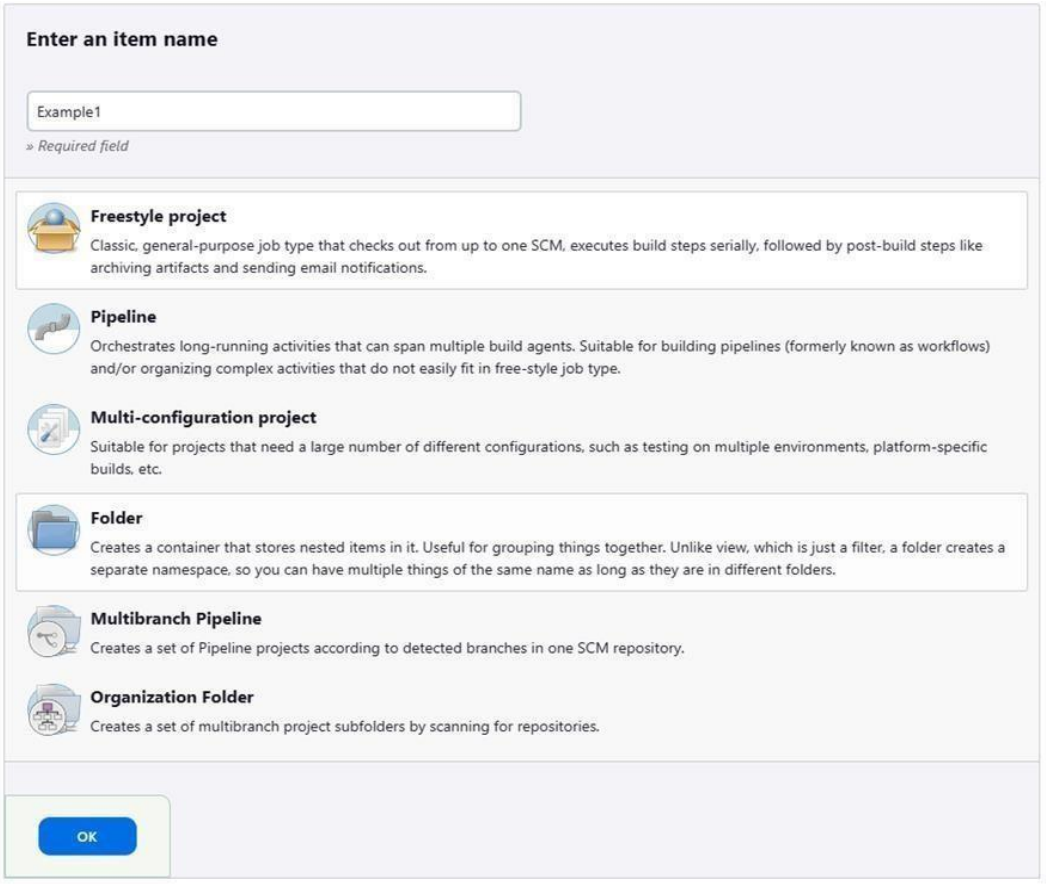
Our first job will execute the shell commands. The freestyle project provides enough options and features to build the complex jobs that you will need in your projects.

Example 1

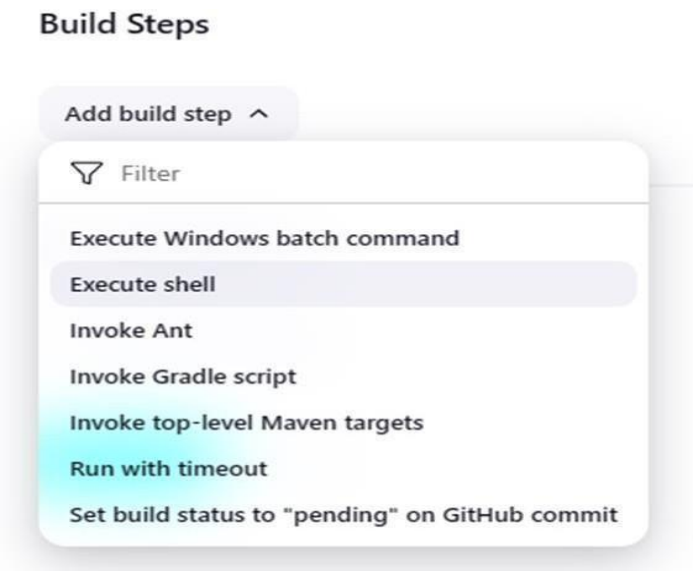
Example 1.1: Deploying a freestyle app in Jenkins

Creating a job:

Naming the job and setting it as freestyle:



Selecting build type as "Execute shell":



Entering a simple command for the shell execution:

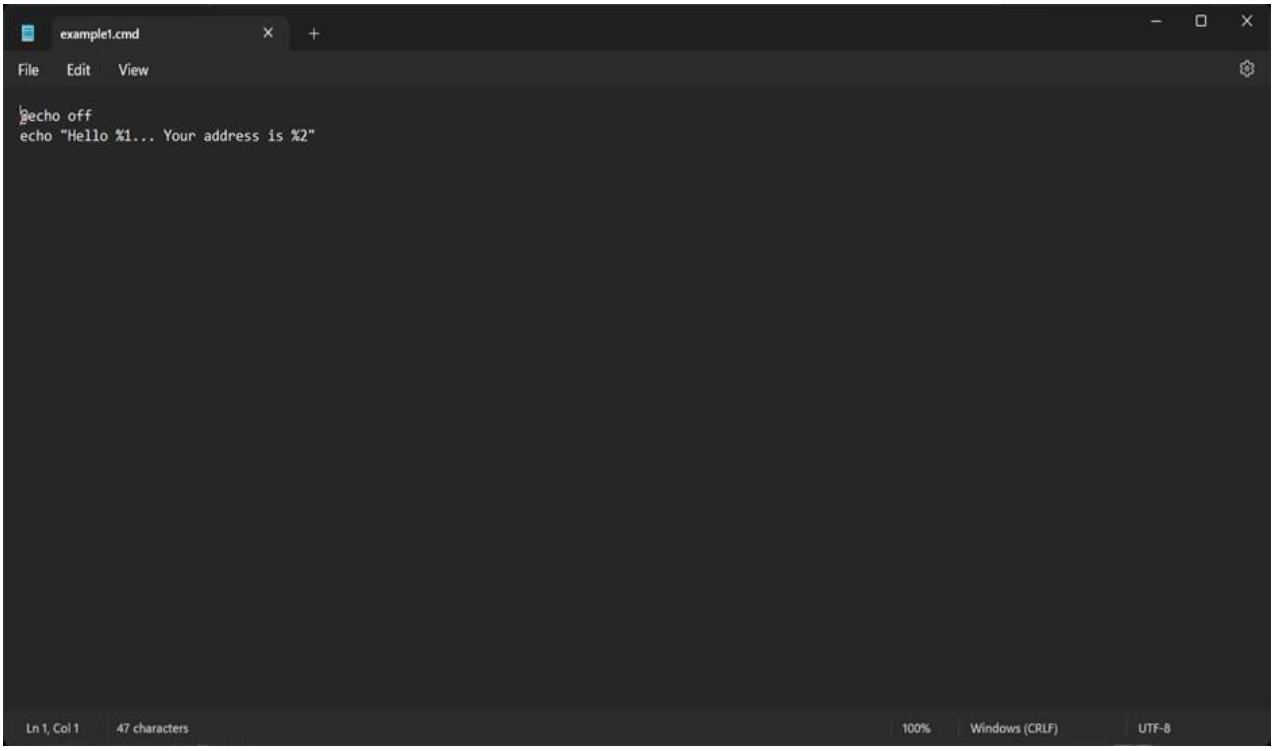
Applying and saving the project configuration:

Building the project:

Console output (after building):

Example 1.2: Taking parameters through files

Contents of script example1.cmd:



Executing script example1.cmd on the terminal:

```
Microsoft Windows [Version 10.0.22621.3296]
(c) Microsoft Corporation. All rights reserved.

C:\Users\AI&DS 202>Microsoft Windows [Version 10.0.22631.3155) (c) Microsoft Corporation. All rights reserved.
'Microsoft' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPM>example1.cmd
The system cannot find the path specified.

C:\Users\AI&DS 202>"Hello... Your address is "
'"Hello... Your address is "' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPM>example1.cad Tanishq
The system cannot find the path specified.

C:\Users\AI&DS 202>"Hello Tanihsq... Your address is "
'"Hello Tanihsq... Your address is "' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPM>example1.cmd Tanishq Girgaon "Helle Tanishq... Your address is Gi
rgaon"
The system cannot find the path specified.
```

Modifying the Jenkins project to execute the script while supplying required parameters:

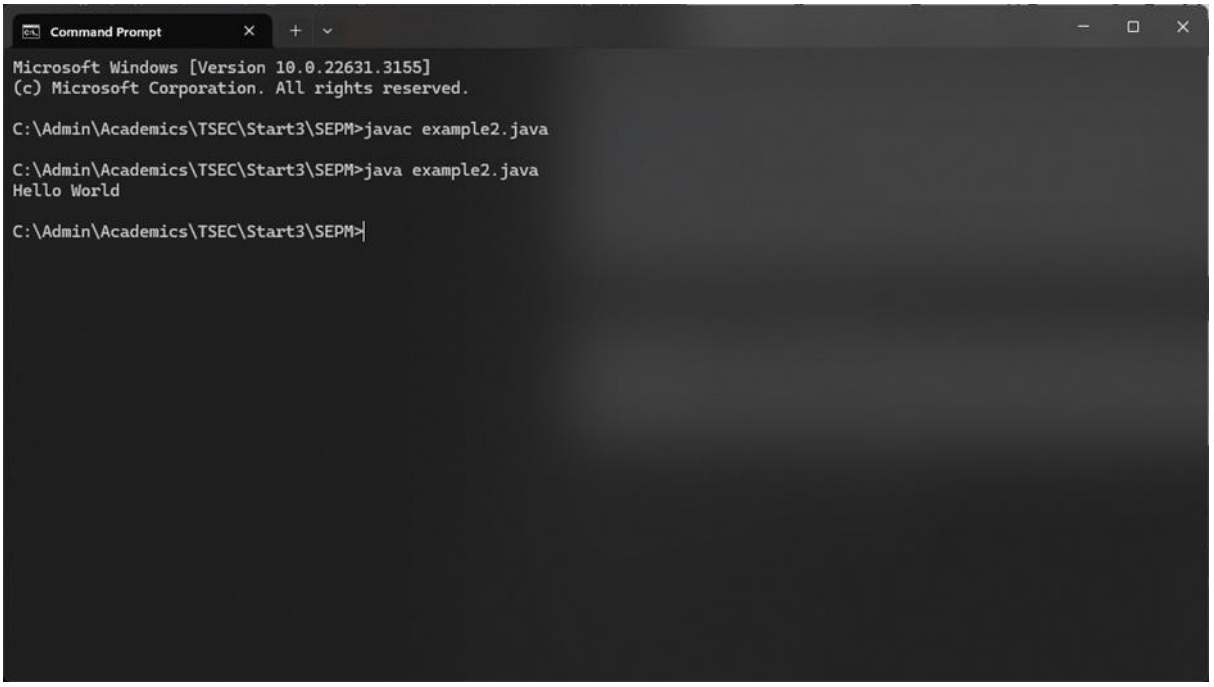
Console output after building the modified project:

Example 2

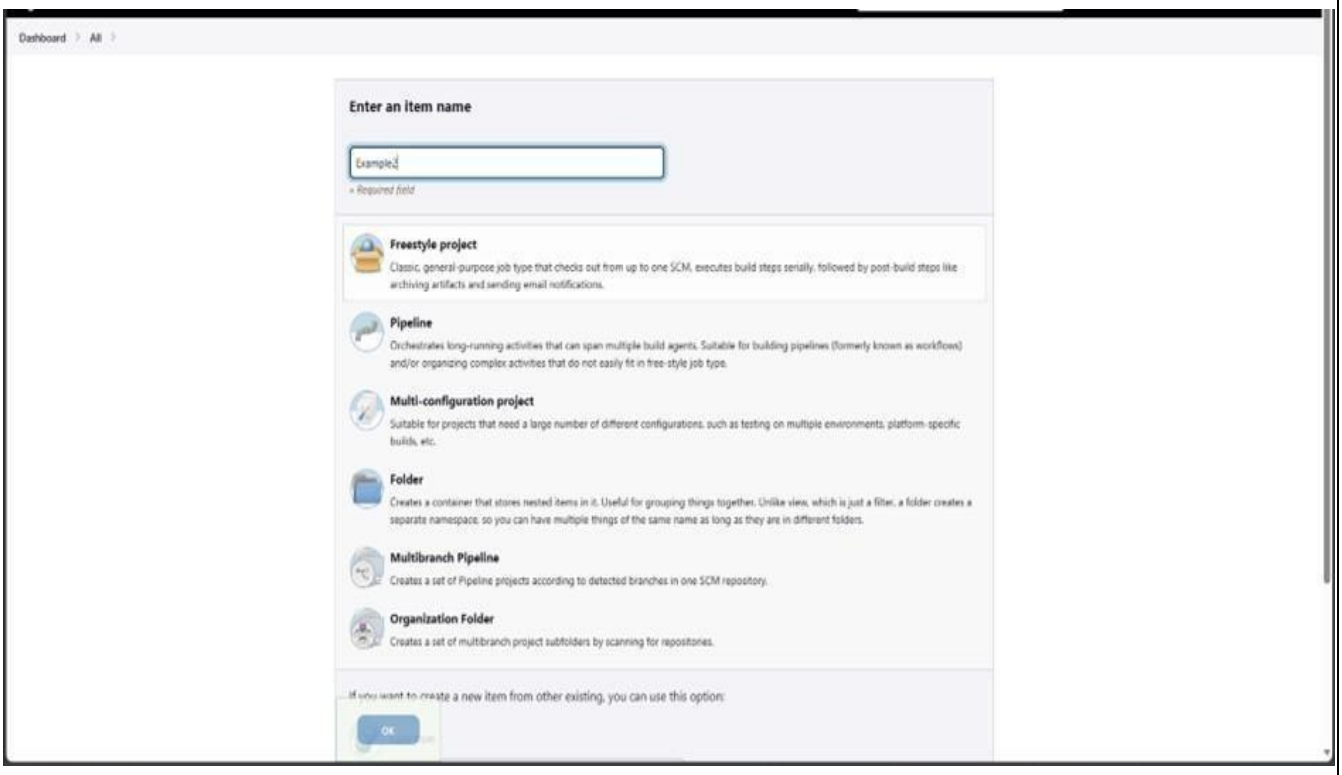
Example 2.1: Running a Java program under Jenkins

Creating a simple Java program:

Compiling and running the program on the terminal:



Creating a new freestyle project:



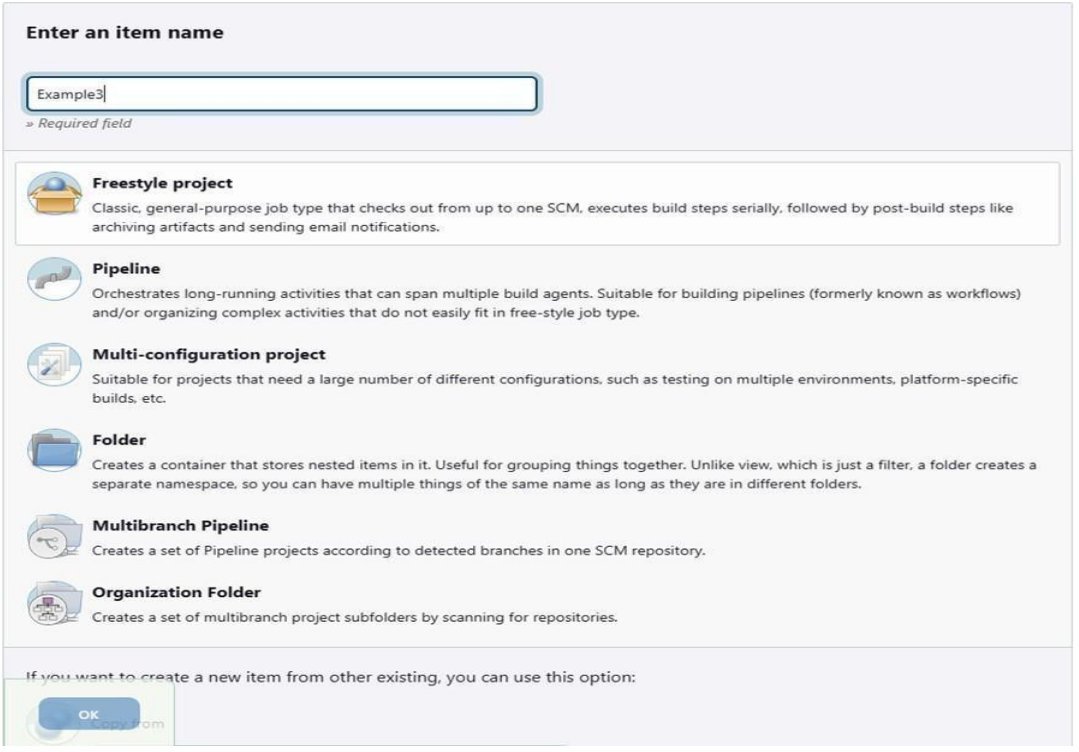
Configure new project:

Console output after building:

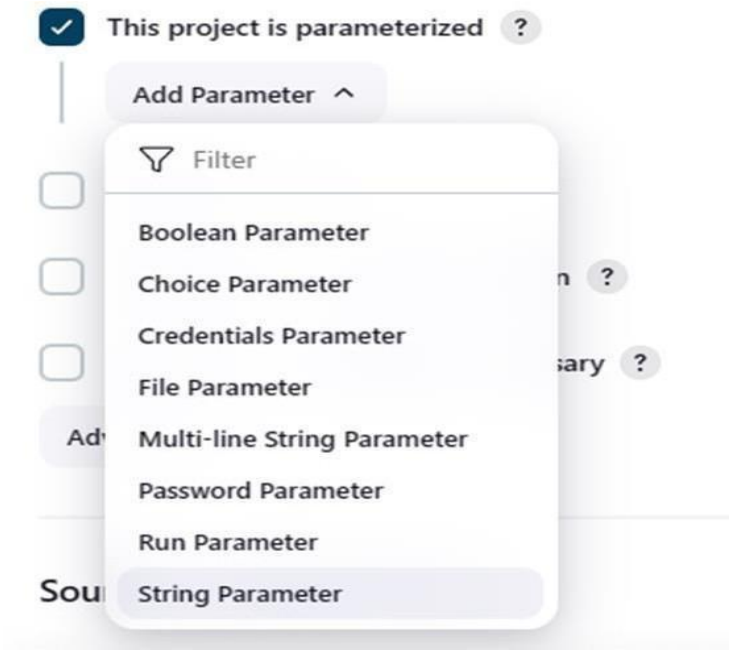
Example 3

Example 3.1: Parameterise build

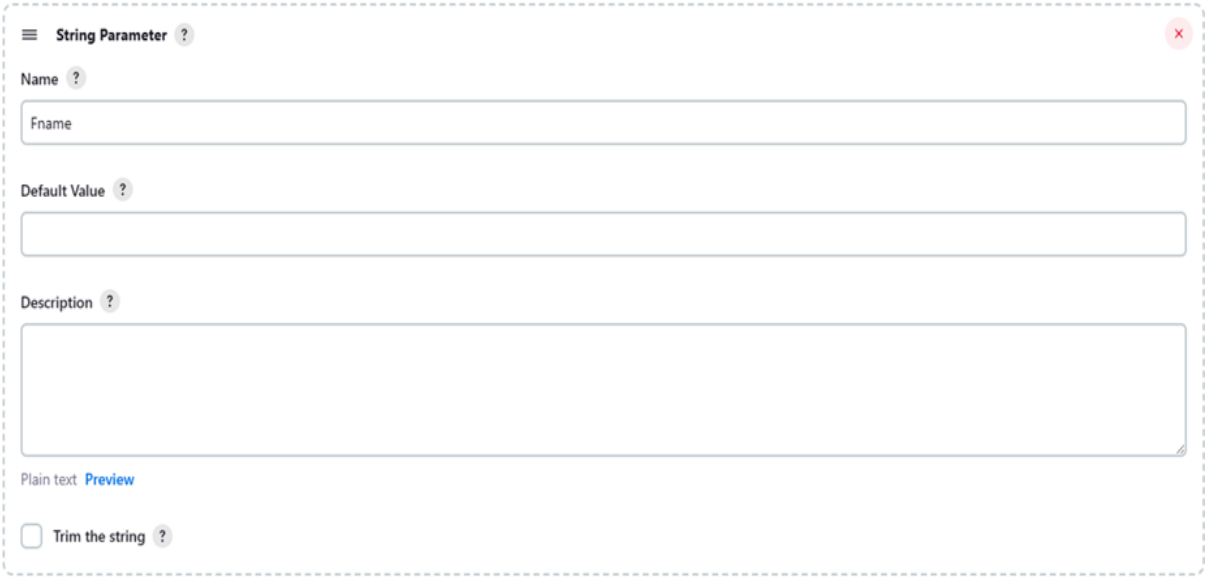
Creating a new freestyle project:



Enabling parameterisation and adding a String parameter:



Configuring the string parameter as Fname:

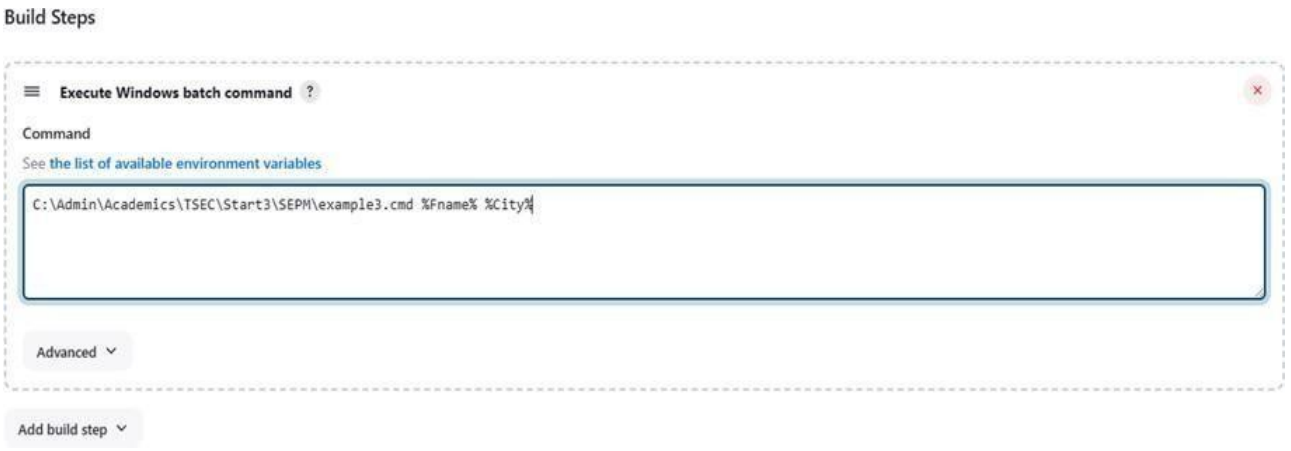


Adding a choice parameter and configuring it as City with the following choices:

Creating a script which takes 2 arguments for name and city:

```
C:\Users\AI&DS 202>Microsoft Windows [Version 10.0.22631.3155] (c) Microsoft Corporation. All rights reserved.
'Microsoft' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPH>example3.cnd
The system cannot find the path specified.

C:\Users\AI&DS 202>Hello your name is and your city is
'Hello' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPH example3.cmd Tanishq
The system cannot find the path specified.

C:\Users\AI&DS 202>Hello your name is Tanishq and your city is
'Hello' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPM>example3.cmd Tansishq Bandra
The system cannot find the path specified.

C:\Users\AI&DS 202>Hello your name is Tanishq and your city is Bandra
'Hello' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPH
```

Configuring build steps:



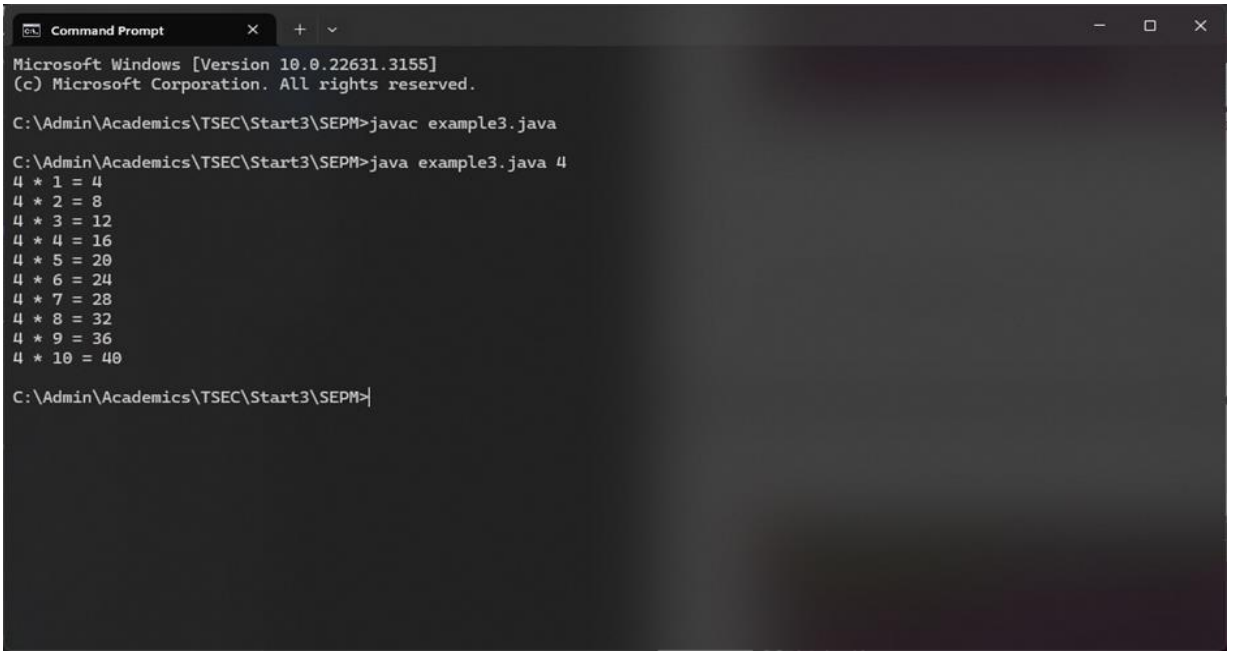
Entering parameters for build:

Console output after building:

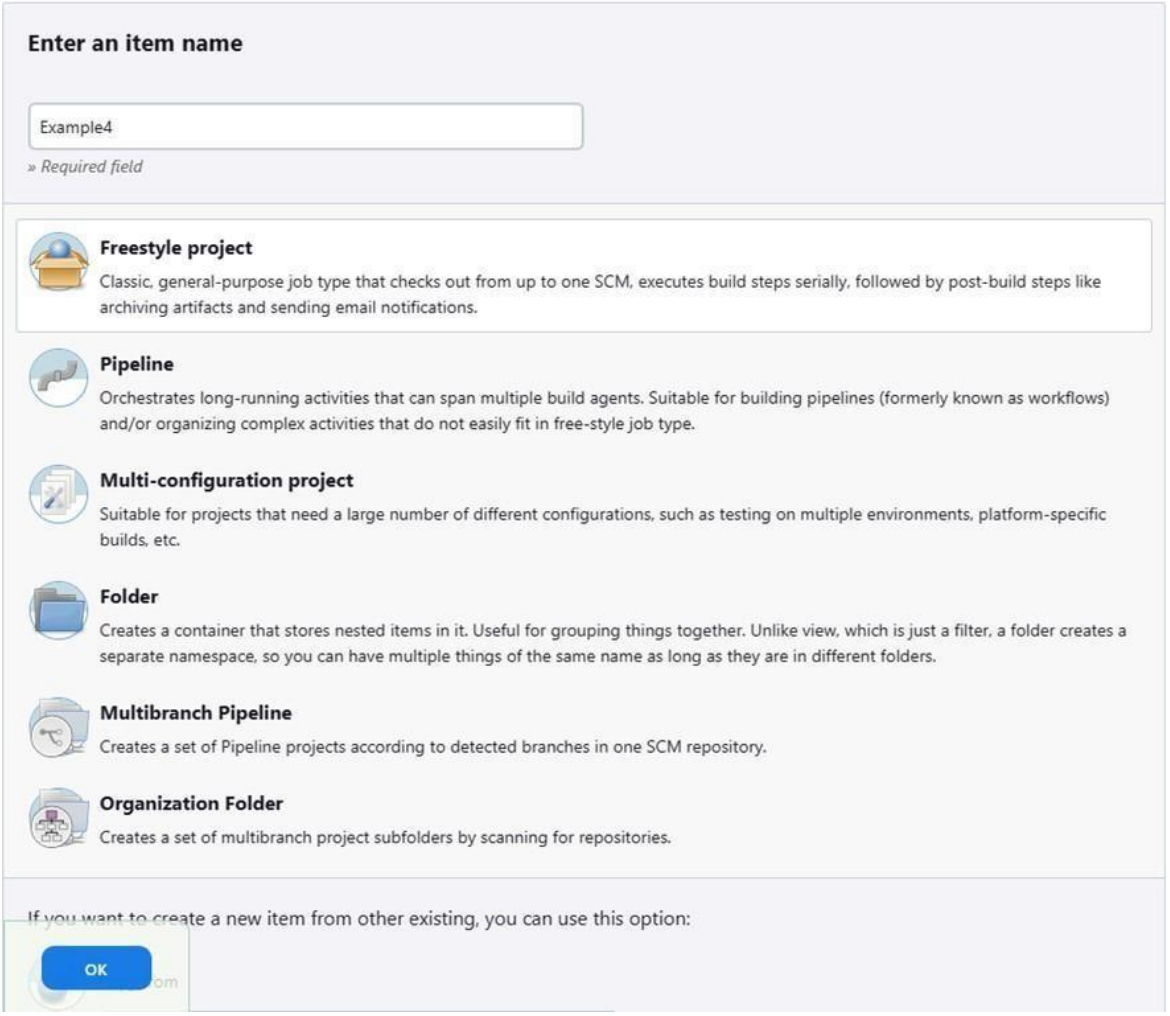
Example 3.2: Running a Java program with parameters

Creating a Java program with an input argument:

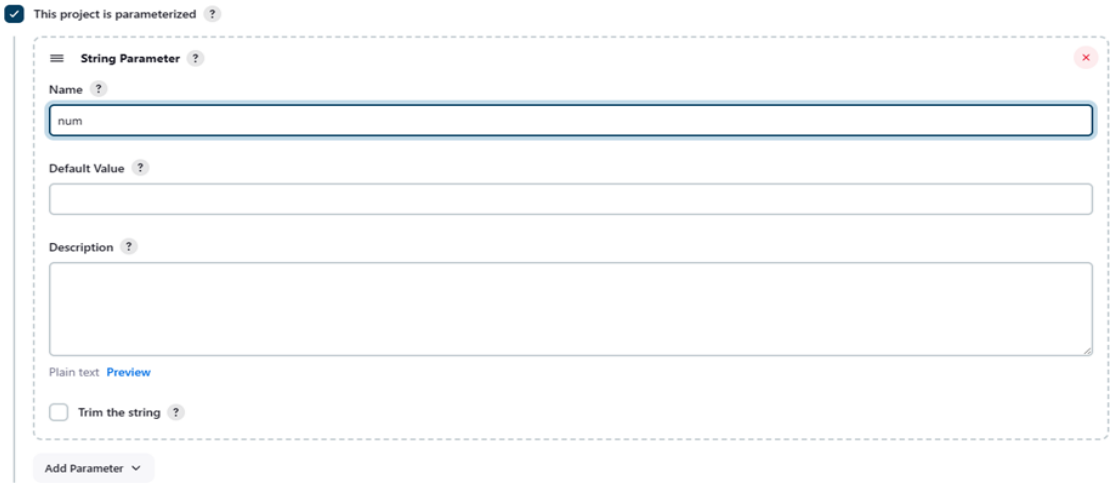
Testing the program on the terminal:



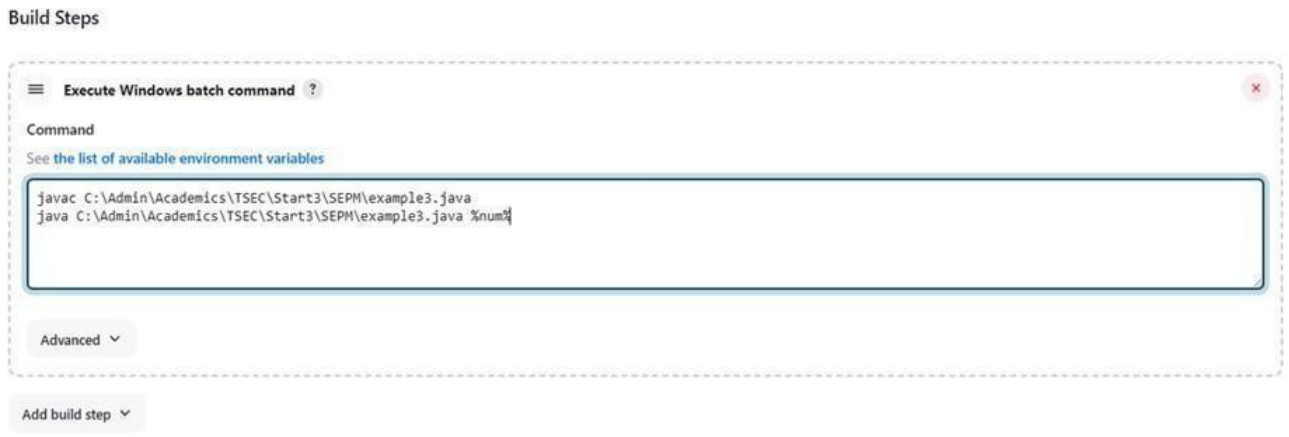
Creating a new freestyle project:



Parameterise the project by adding a string parameter as follows:



Configure the build steps:



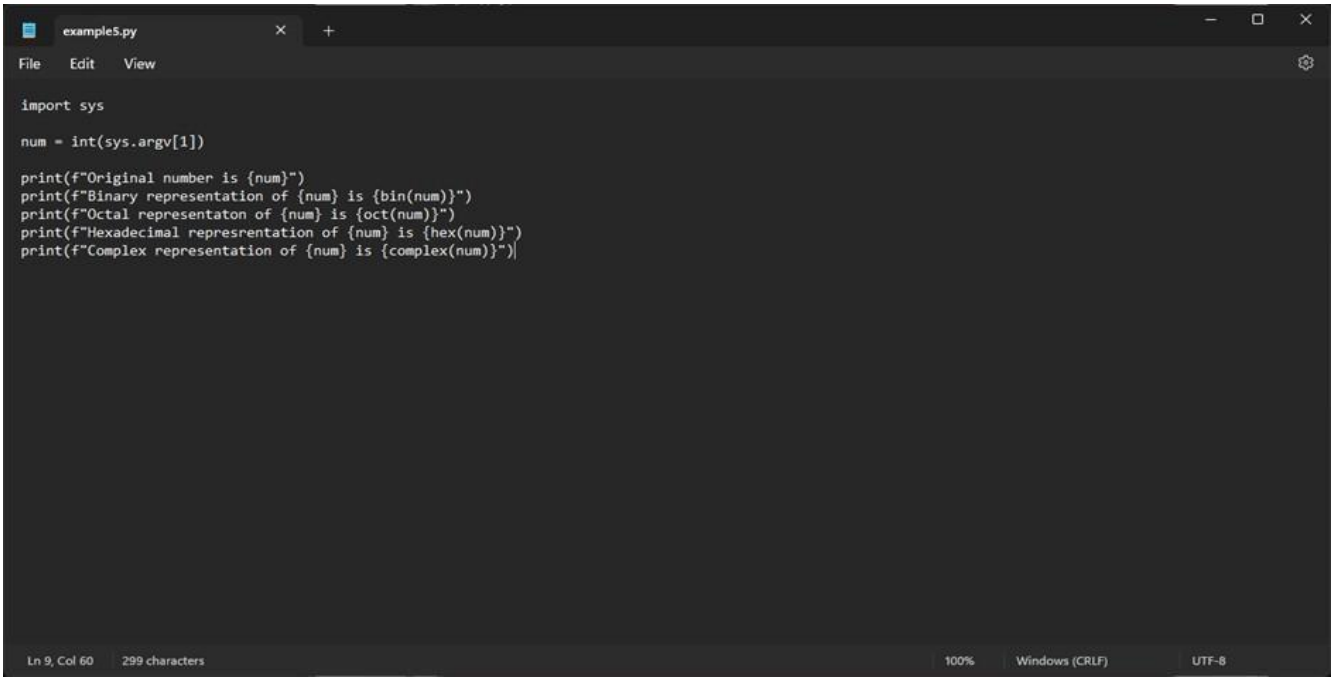
Entering the parameter for the build:

Console output after building:

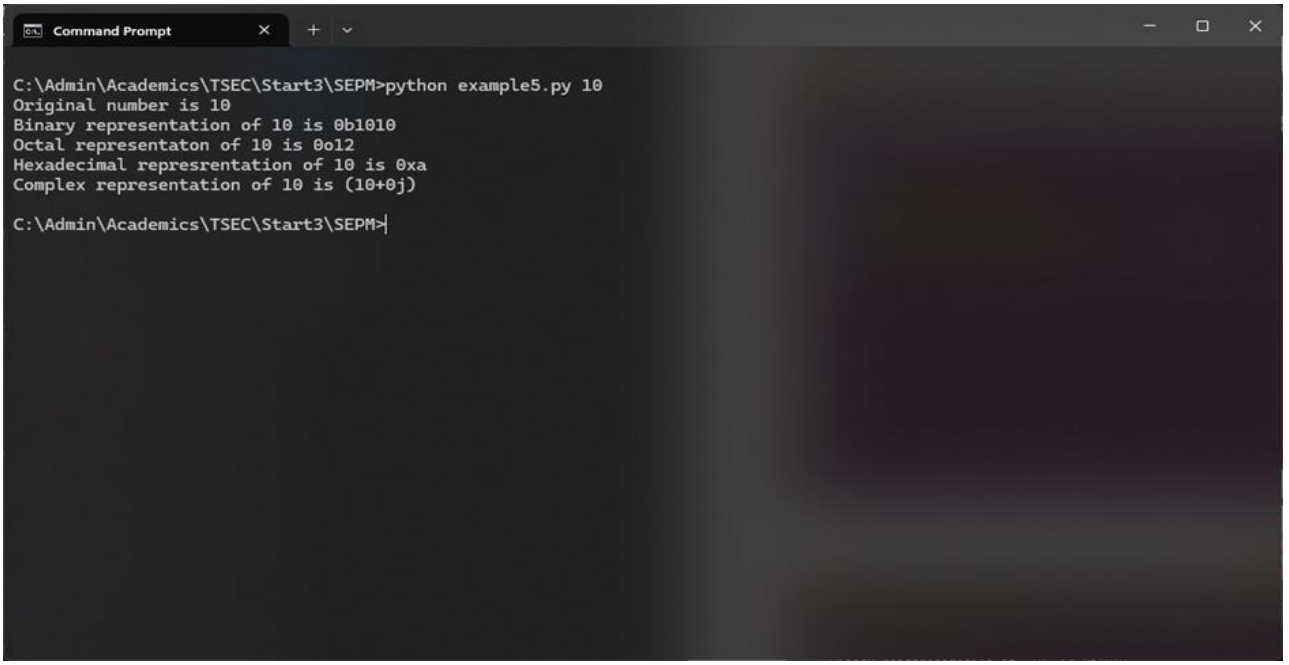
Example 5

Example 5.1: Running a Python program

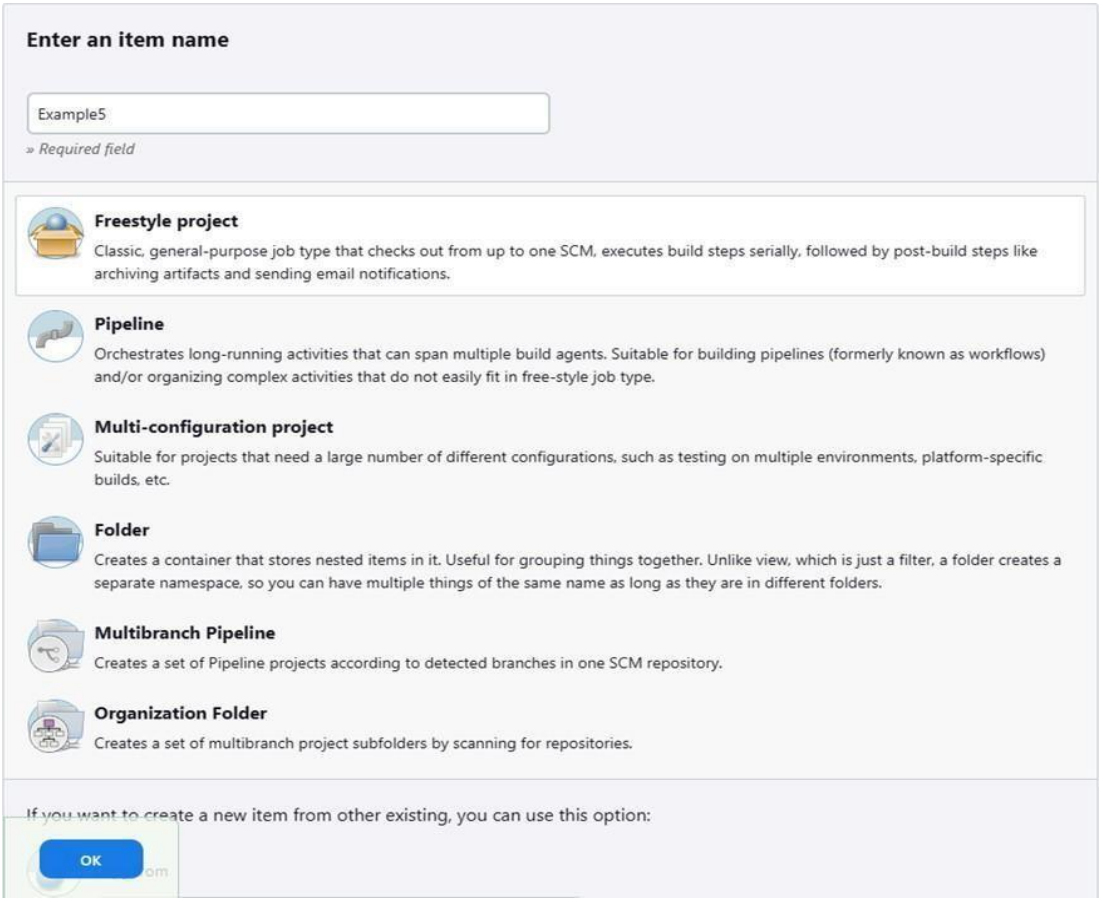
Creating a simple Python script:



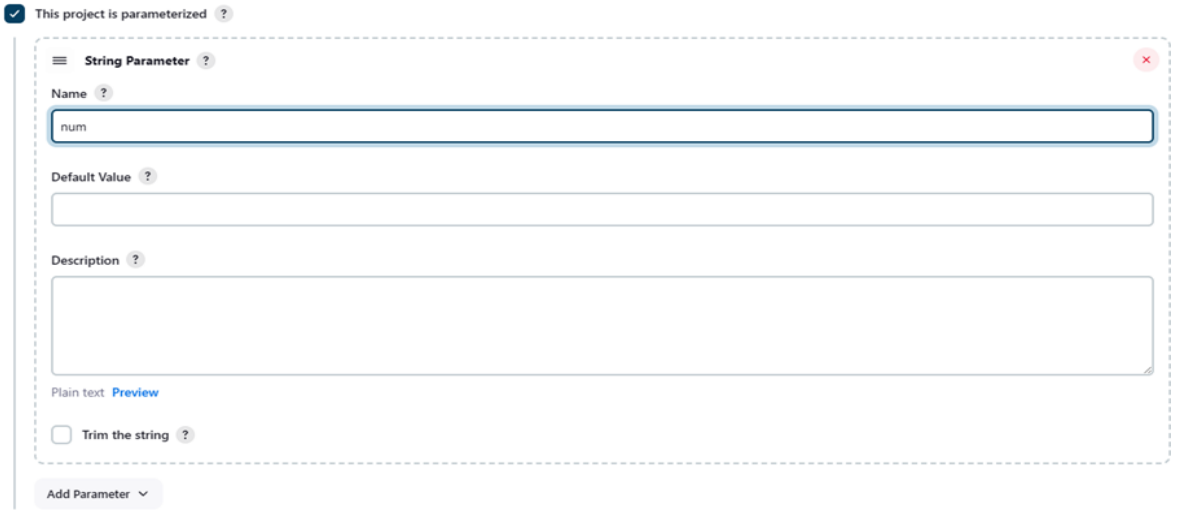
Running the Python script on the terminal:



Creating a new freestyle project:



Parameterising the project with a string parameter as follows:

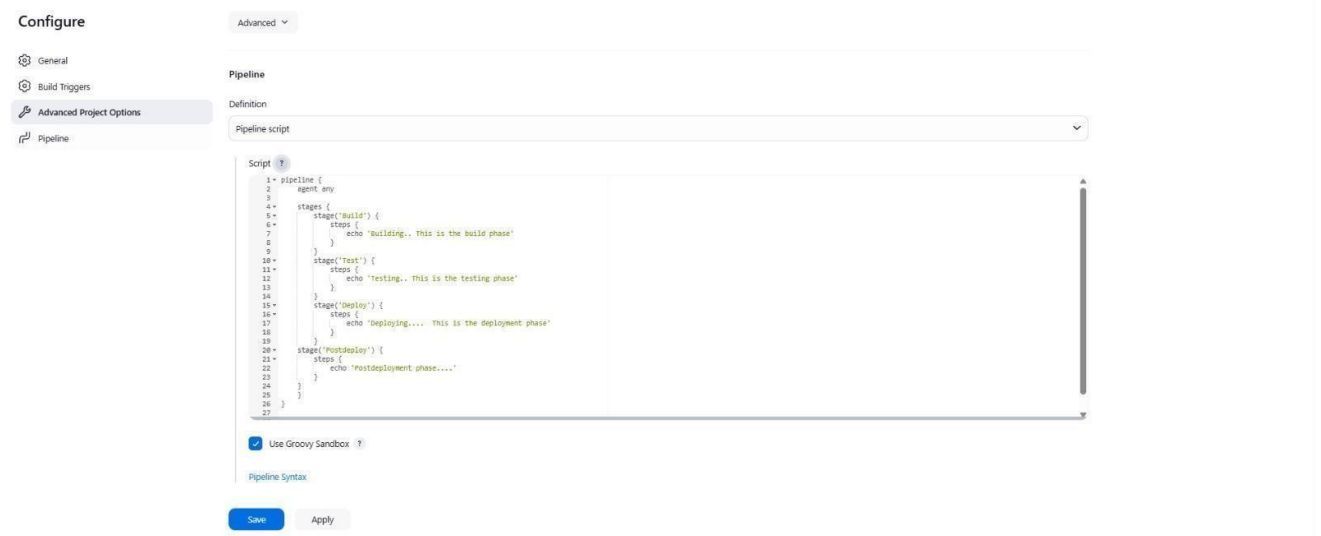


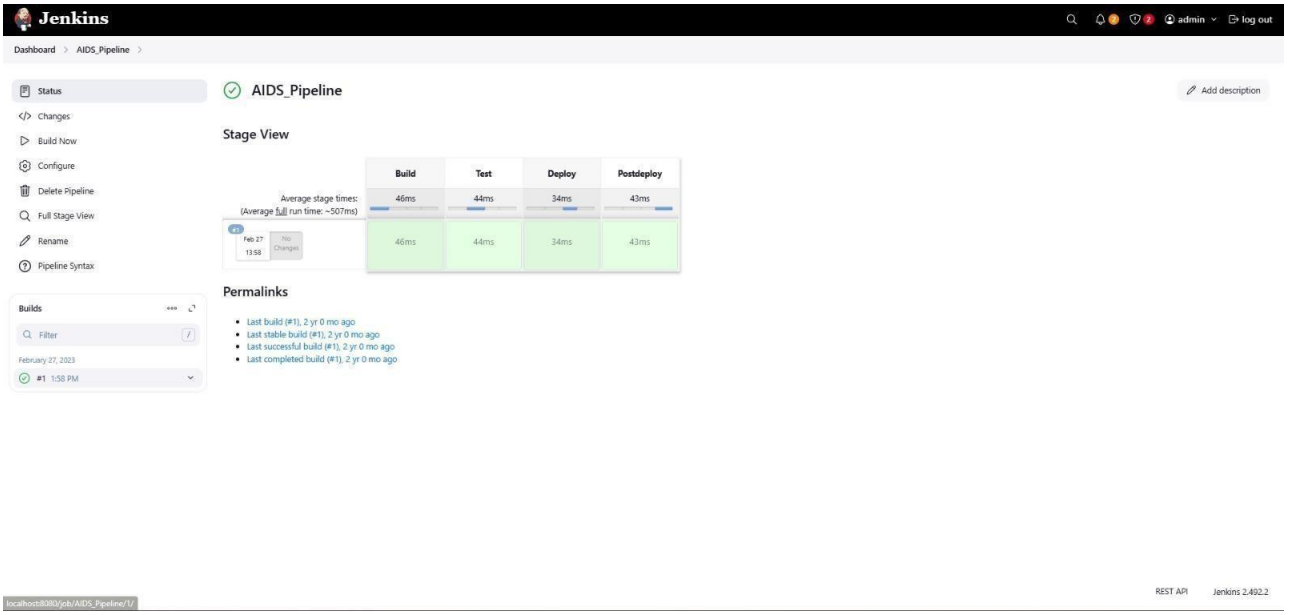
Configuring the build steps:

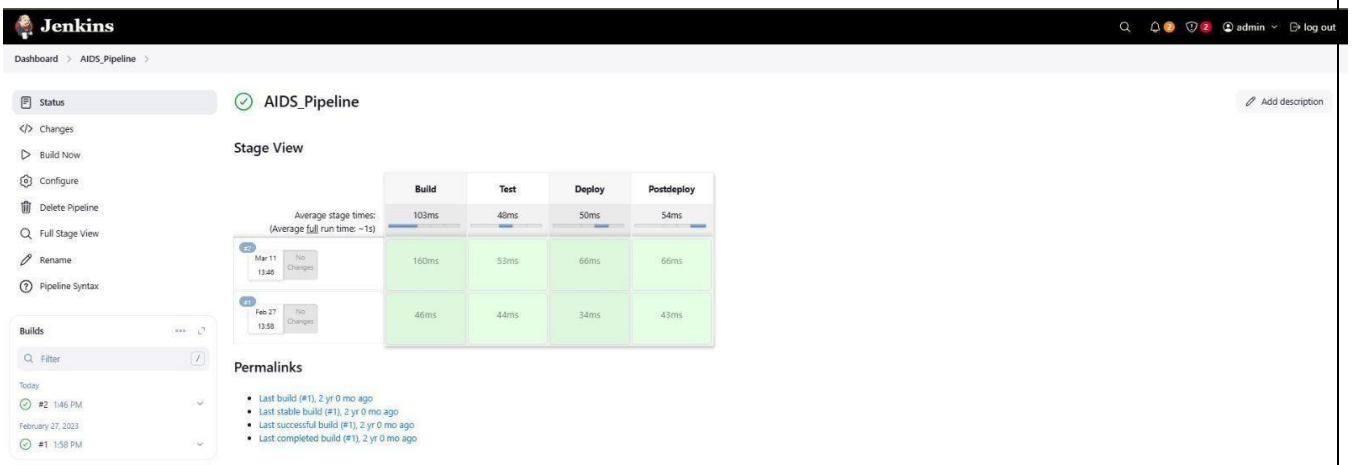
Setting the parameter for the build:

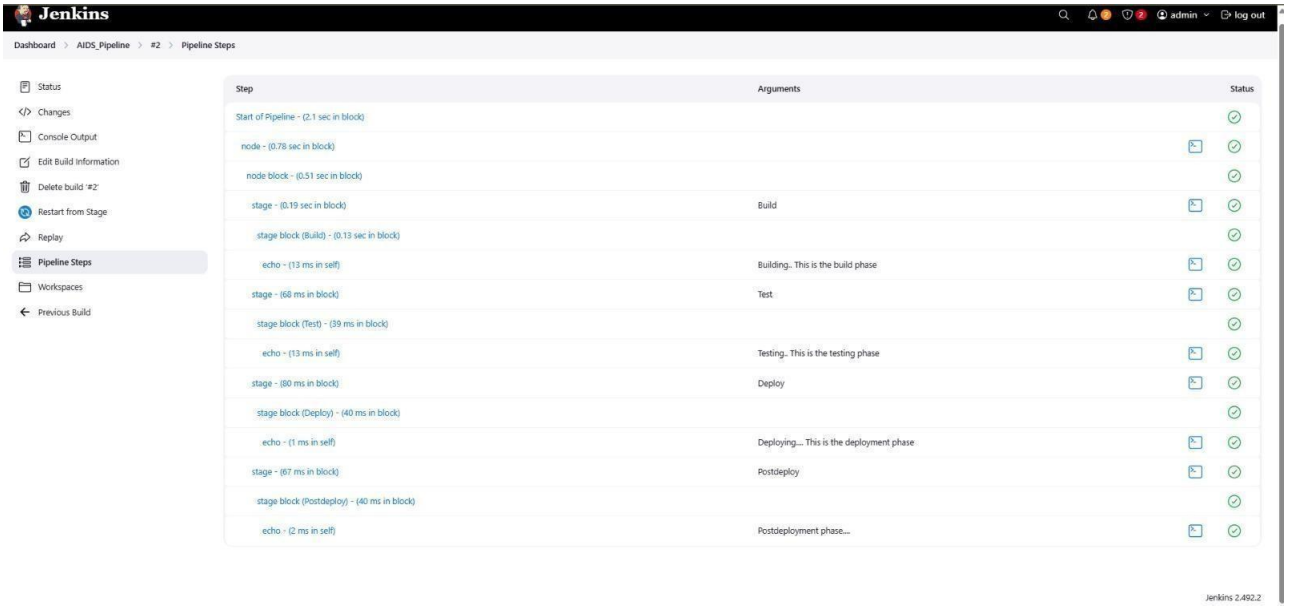
Console output after building:

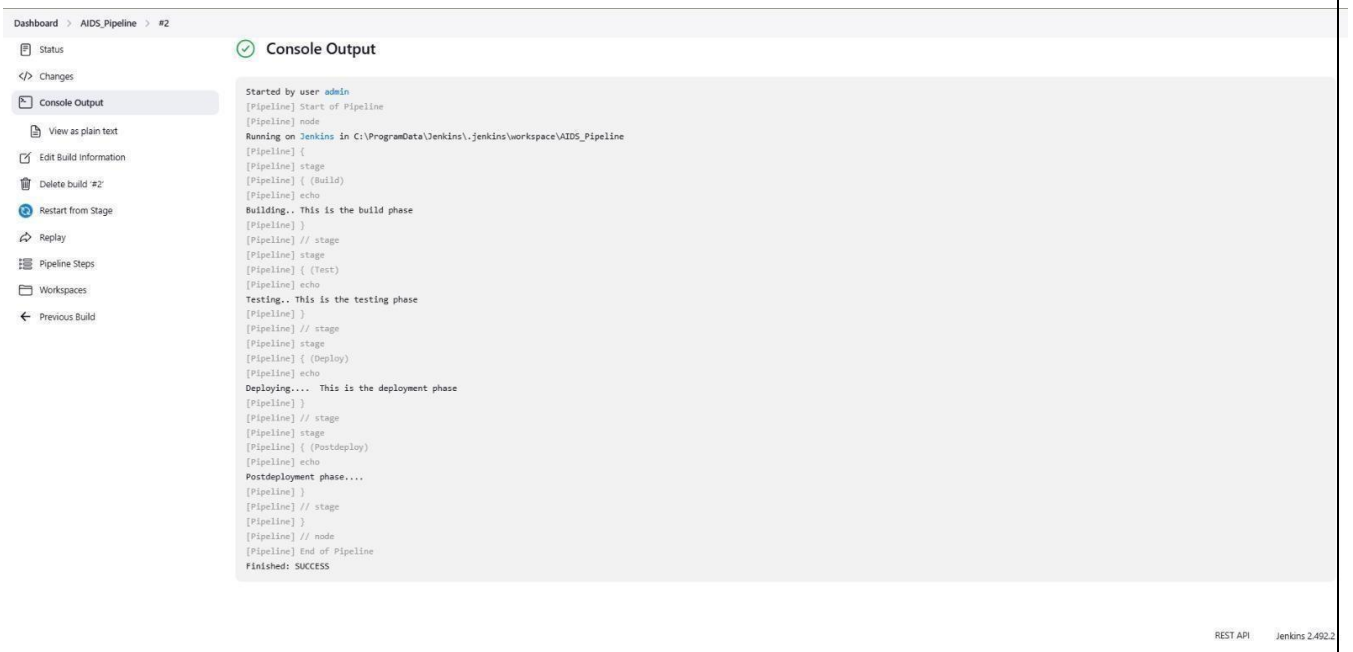
Some Screenshots:

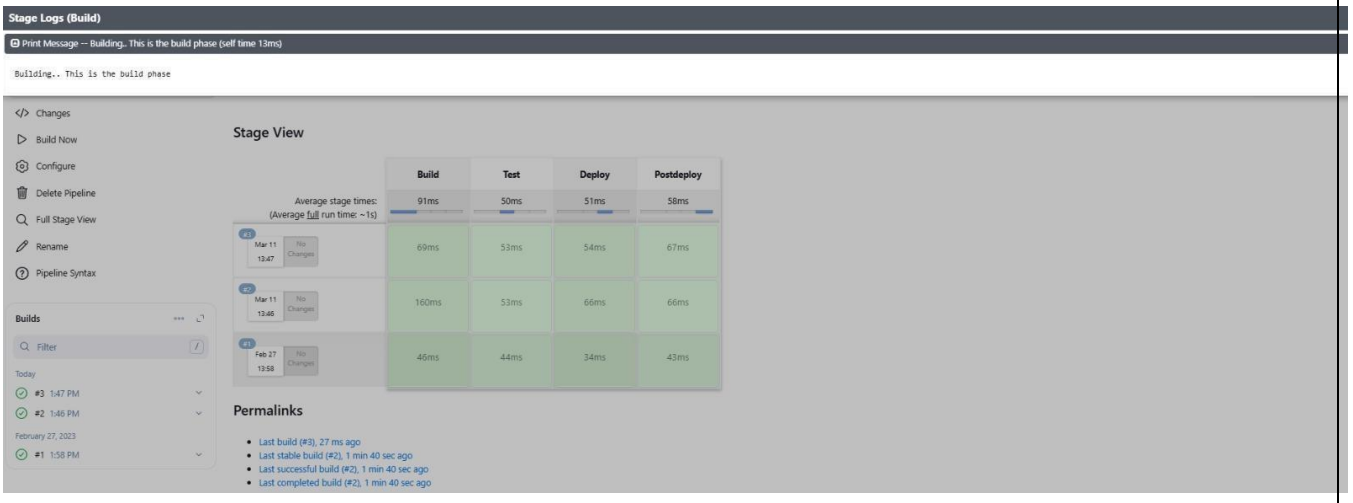





Jenkins
admin
log out
Dashboard
AIDS_Pipeline
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Rename
Pipeline Syntax
Builds
Filter
Today
#2 1:46 PM
February 27, 2023
#1 1:58 PM
AIDS_Pipeline
Add description
Stage View
Build
Test
Deploy
Postdeploy
Average stage times:
(Average full run time: ~1s)
103ms
48ms
50ms
54ms
Mar 11
13:46
No Changes
160ms
53ms
66ms
66ms
Feb 27
13:58
No Changes
46ms
44ms
34ms
43ms
Permalinks
Last build (#1), 2 yr 0 mo ago
Last stable build (#1), 2 yr 0 mo ago
Last successful build (#1), 2 yr 0 mo ago
Last completed build (#1), 2 yr 0 mo ago


Jenkins
admin
log out
Dashboard
AIDS_Pipeline
#2
Pipeline Steps
Status
Changes
Console Output
Edit Build Information
Delete build '#2'
Restart from Stage
Replay
Pipeline Steps
Workspaces
Previous Build
Step
Arguments
Status
Start of Pipeline - (2.1 sec in block)
node - (0.78 sec in block)
node block - (0.51 sec in block)
stage - (0.19 sec in block)
Build
stage block (Build) - (0.13 sec in block)
echo - (13 ms in self)
Building.. This is the build phase
stage - (68 ms in block)
Test
stage block (Test) - (39 ms in block)
echo - (13 ms in self)
Testing.. This is the testing phase
stage - (80 ms in block)
Deploy
stage block (Deploy) - (40 ms in block)
echo - (1 ms in self)
Deploying.... This is the deployment phase
stage - (67 ms in block)
Postdeploy
stage block (Postdeploy) - (40 ms in block)
echo - (2 ms in self)
Postdeployment phase....
Jenkins 2.492.2





<u>Conclusion</u>: Thus, we have successfully Build the pipeline of jobs using Maven / Gradle / Ant in Jenkins, created a pipeline script to Test and deploy an application over the tomcat server.