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EXPERIMENT NO :05

Aim: Experiment 5: 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

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:

Start building your software project



Naming the job and setting it as freestyle:

The screenshot shows a dashboard for a build system. At the top, there's a user profile icon and the text "Dashboard 24_34_31_45_40_42_37_41". Below this is a sidebar with navigation links: Status, Changes, Workspace, Build Now, Configure, Delete Project, and Rename. The main area displays the project ID "24_34_31_45_40_42_37_41" and a "Permalinks" section with a list of build links: "Last build (#6), 31 min ago", "Last stable build (#6), 31 min ago", "Last successful build (#6), 31 min ago", and "Last completed build (#6), 31 min ago". Below the permalinks is a "Builds" section with a filter input and a table of builds. The table has columns for build number, time, and a dropdown arrow. The builds listed are #6, #5, #4, #3, #2, and #1, all at 10:41 AM, 10:37 AM, 10:37 AM, 10:37 AM, 10:37 AM, and 10:37 AM respectively.

Dashboard 24_34_31_45_40_42_37_41

Status 24_34_31_45_40_42_37_41

Changes

Workspace

Build Now

Configure

Delete Project

Rename

Permalinks

- Last build (#6), 31 min ago
- Last stable build (#6), 31 min ago
- Last successful build (#6), 31 min ago
- Last completed build (#6), 31 min ago

Builds

Filter

Today

#6	10:41 AM	▼
#5	10:37 AM	▼
#4	10:37 AM	▼
#3	10:37 AM	▼
#2	10:37 AM	▼
#1	10:37 AM	▼

Selecting build type as “Execute shell”:

Build Steps

Add build step ^

Filter

Execute Windows batch command

Execute shell

Invoke Ant

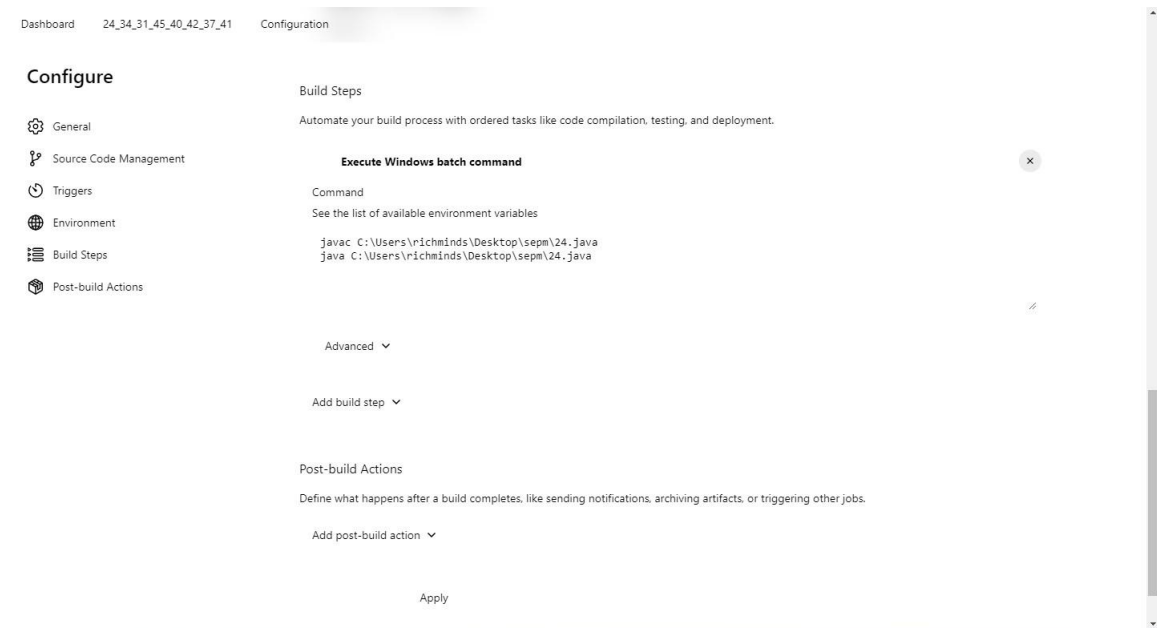
Invoke Gradle script

Invoke top-level Maven targets

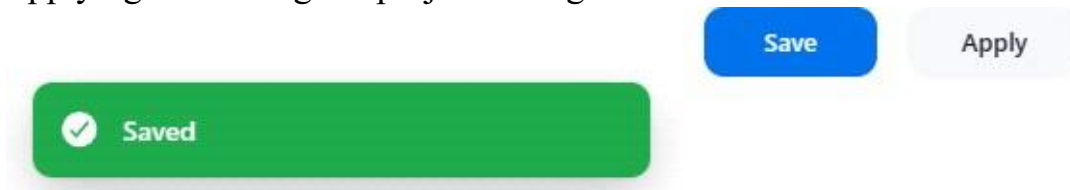
Run with timeout

Set build status to "pending" on GitHub commit

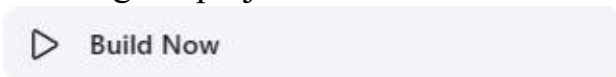
Entering a simple command for the shell execution:



Applying and saving the project configuration:

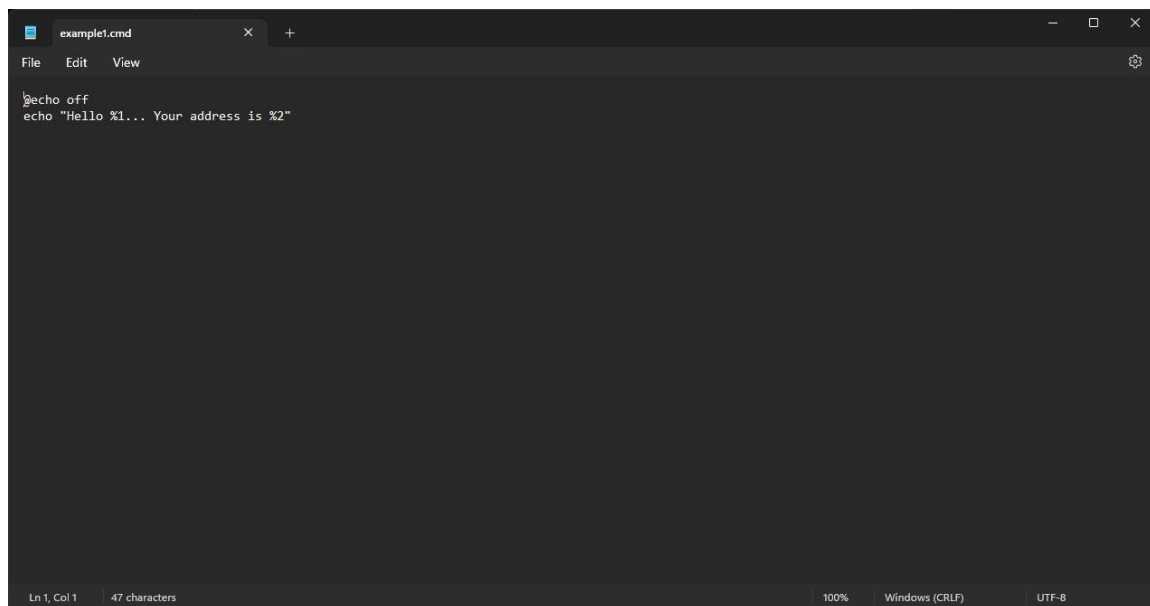


Building the project:



Console output (after building):





```
example1.cmd
File Edit View
echo off
echo "Hello %1... Your address is %2"
Ln 1, Col 1 47 characters 100% Windows (CRLF) UTF-8
```

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:

Build Steps

Execute Windows batch command ?

Command

See [the list of available environment variables](#)

C:\Admin\Academics\TSEC\Start3\SEPM\example1.cmd Siddhant Goregaon

Advanced ▾

Add build step ▾

Console output after building the modified project:

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build '#4'

Previous Build

Console Output

Started by user Siddhant Chetlur
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\workspace\example1
[Example1] \$ cd /c call C:\WINDOWS\TEMP\jenkins787569581830161158.bat

C:\ProgramData\Jenkins\workspace\example1\C:\Admin\Academics\TSEC\Start3\SEPM\example1.cmd Siddhant Goregaon
"Hello Siddhant... Your address is Goregaon"
Finished: SUCCESS

Running a Java program under Jenkins

Creating a simple Java program:

Compiling and running the program on the terminal:

```
C:\Users\richminds\Desktop\sepm>javac 24.java  
  
C:\Users\richminds\Desktop\sepm>java 24.java  
This is T12  
  
C:\Users\richminds\Desktop\sepm>
```

Creating a new freestyle project:

Dashboard > All >

Enter an item name

Example1

Required field

Freestyle project
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.

Organization Folder
Creates a set of multibranch project subfolders by scanning for repositories.

If you want to create a new item from other existing, you can use this option:

OK

Configure new project:

Command

See the list of available environment variables

```
javac C:\Users\richminds\Desktop\sepm\24.java
java C:\Users\richminds\Desktop\sepm\24.java
```

Console output after building:

Console Output

[Download](#)[Copy](#)[View as plain text](#)

```
Started by user Aditya Dikonda
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\.jenkins\workspace\24_34_31_45_40_42_37_41
[24_34_31_45_40_42_37_41] $ cmd /c call C:\WINDOWS\TEMP\jenkins3970528995341461278.bat

C:\ProgramData\Jenkins\.jenkins\workspace\24_34_31_45_40_42_37_41>javac C:\Users\richminds\Desktop\sepm\24.java

C:\ProgramData\Jenkins\.jenkins\workspace\24_34_31_45_40_42_37_41>java C:\Users\richminds\Desktop\sepm\24.java
This is T12

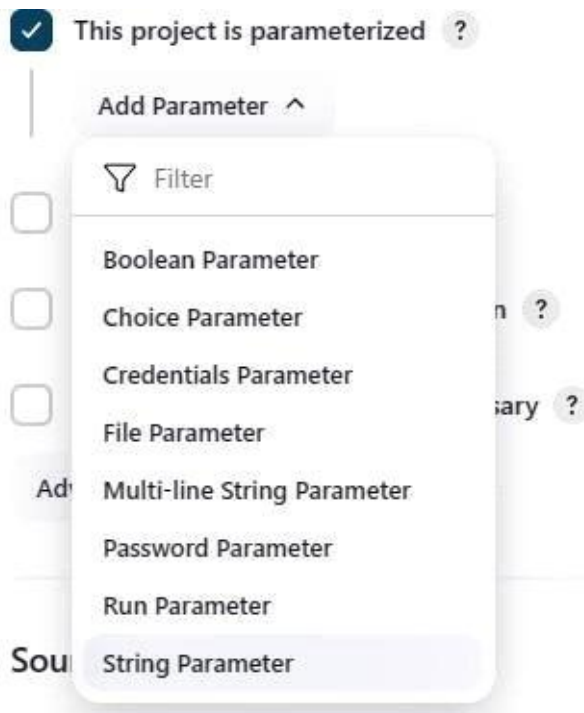
C:\ProgramData\Jenkins\.jenkins\workspace\24_34_31_45_40_42_37_41>exit 0
Finished: SUCCESS
```

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:

String Parameter ?

Name ?

Fname

Default Value ?

Description ?

Plain text [Preview](#)

☐ Trim the string ?

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

Choice Parameter

Name

City

Choices

Ambemath

Badlapur

Kalyan

Dombivli

Requires Choices.

Description

Configuring build steps:

Build Steps

≡

Execute Windows batch command ?

✕

Command

See [the list of available environment variables](#)

```
C:\Admin\Academics\TSEC\Start3\SEPH\example3.cmd %Fname% %City%
```

Advanced ▾

Add build step ▾

Entering parameters for build:

Project Example3

This build requires parameters:

Fname

City

▶ Build

Cancel

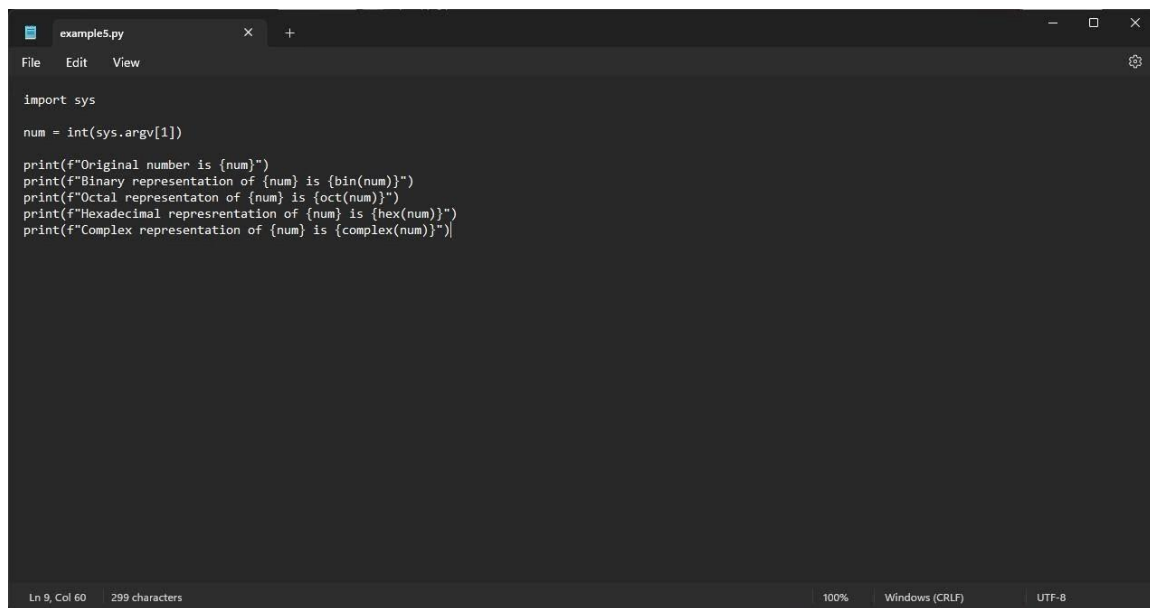
Console output after building:

✓ Console Output

```
Started by user: Siddhant Chetlur
Running as SYSTEM
[EnvInject] - Loading node environment variables.
Building in workspace C:\ProgramData\Jenkins\jenkins\workspace\Example3
[Example3] $ cmd /c call C:\WINDOWS\TEMP\jenkins14094536165150906151.bat

C:\ProgramData\Jenkins\jenkins\workspace\Example3>C:\Admin\Academics\TSEC\Start3\SEPH\example3.cmd Siddhant Bandra
Hello your name is Siddhant and your city is Bandra
Finished: SUCCESS
```

Example 5



```
example5.py
File Edit View
import sys

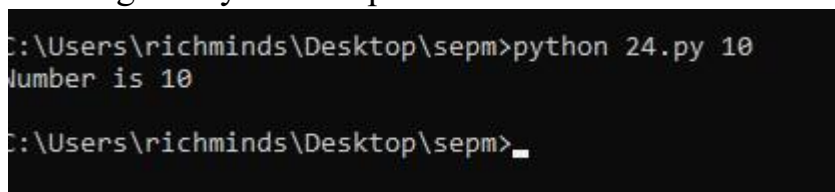
num = int(sys.argv[1])

print(f"Original number is {num}")
print(f"Binary representation of {num} is {bin(num)}")
print(f"Octal representation of {num} is {oct(num)}")
print(f"Hexadecimal representation of {num} is {hex(num)}")
print(f"Complex representation of {num} is {complex(num)}")

Ln 9, Col 60 299 characters 100% Windows (CRLF) UTF-8
```

Example 5.1: Running a Python program
Creating a simple Python script:

Running the Python script on the terminal:



```
C:\Users\richminds\Desktop\sepm>python 24.py 10
Number is 10


C:\Users\richminds\Desktop\sepm>
```

Creating a new freestyle project:


Enter an item name

Example5


» Required field


Freestyle project


Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.


Pipeline


Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.


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OK

Parameterising the project with a string parameter as follows:

☒ This project is parameterized ?

String Parameter ?

Name ?

num

Default Value ?

Description ?

Plain text [Preview](#)

☐ Trim the string ?

Add Parameter

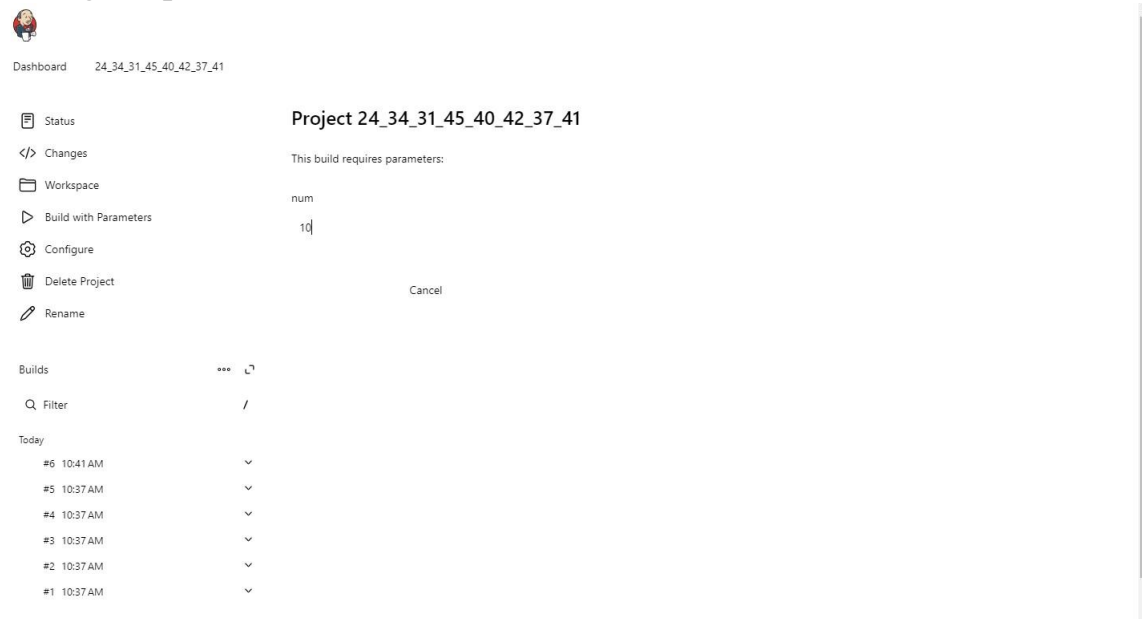
Configuring the build steps:

Command

See the list of available environment variables

```
python C:\Users\richminds\Desktop\sepm\24.py
```

Setting the parameter for the build:



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