

## EXPERIMENT-05

**AIM: Demonstrate Continuous Integration and Development Using Jenkins**

**Objective:** To demonstrate continuous integration and continuous development (CI/CD) by automating build and deployment processes using Jenkins.

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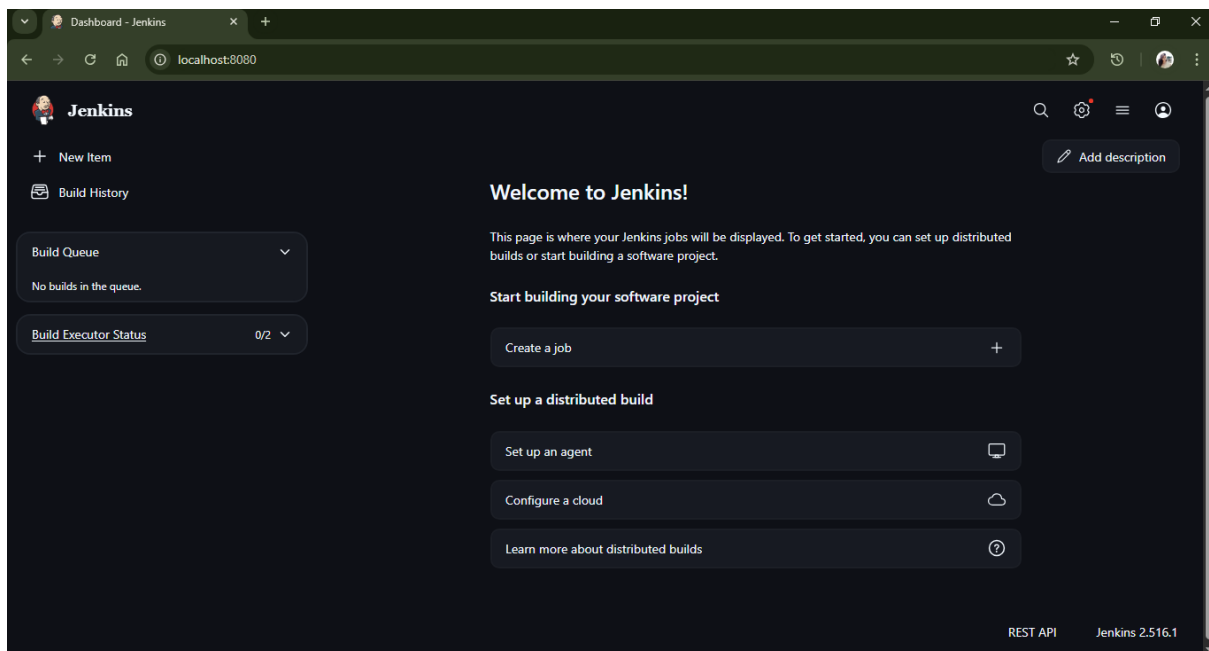
### Software Requirements

- Jenkins installed and configured (<https://www.jenkins.io/download/>)
  - Java installed (JDK 11 or higher)
  - Git installed (<https://git-scm.com/downloads>)
  - A sample project (Java/Python/Node.js etc.)
  - Web browser
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### Procedure

#### 1. Configure Jenkins for CI/CD

- Ensure Jenkins is installed and accessible via <http://localhost:8080>.
- Log in to Jenkins dashboard.



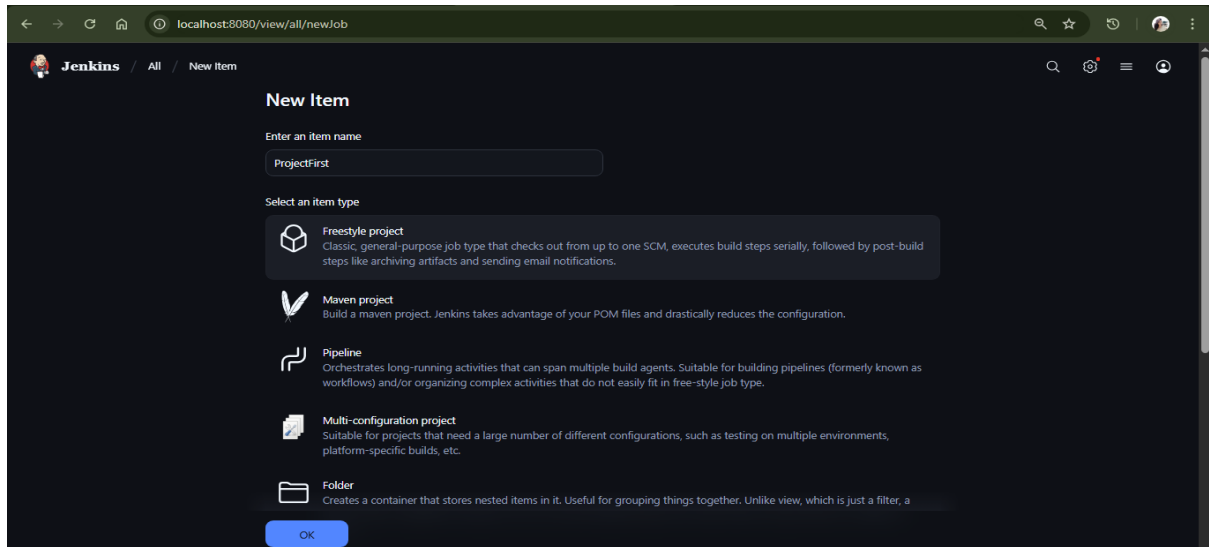
#### 2. Install Required Plugins

- Go to **Settings > Manage Jenkins > Plugins**.
- Install the following plugins if not already installed:
  - Git Plugin

- Pipeline Plugin
  - Any relevant build tool plugin (Maven, Gradle, etc.)
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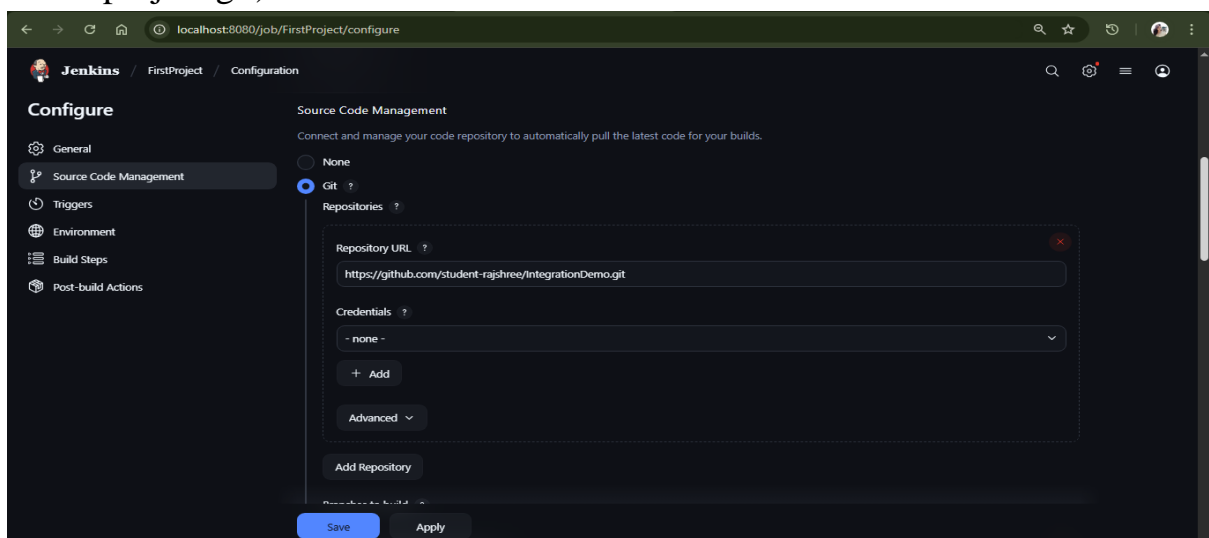
### 3. Create New Freestyle Project

- Click on **New Item**.
- Enter project name and select **Freestyle project**.
- Click **OK**.



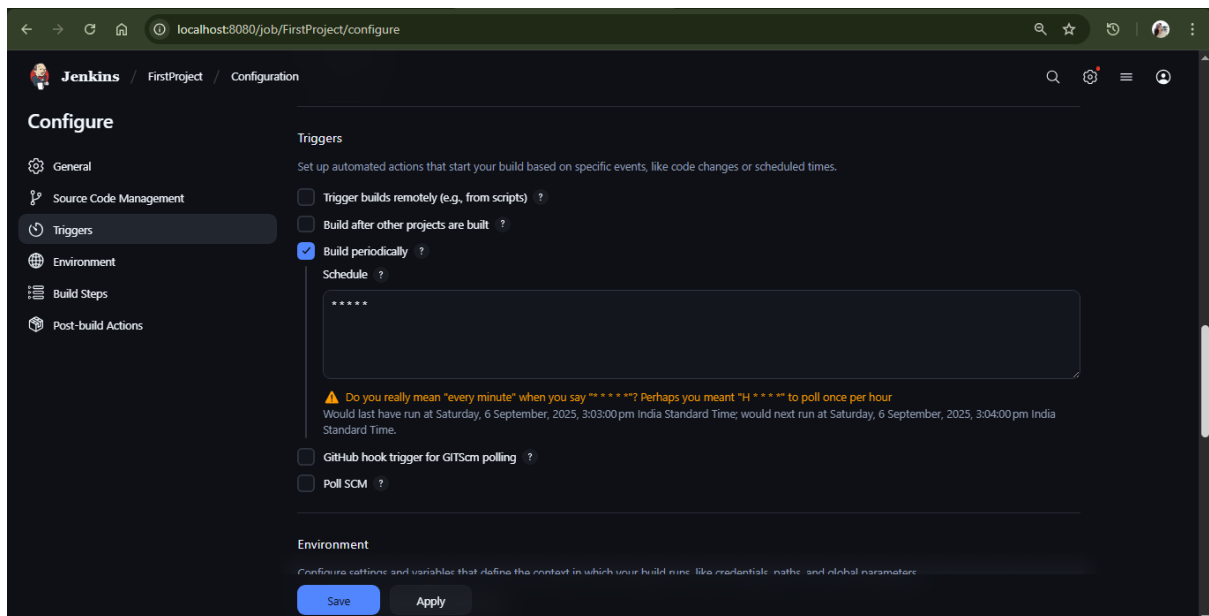
### 4. Configure Source Code Management

- In the project configuration, go to **Source Code Management**.
- Select **Git**.
- Enter repository URL (e.g., <https://github.com/your-username/sample-project.git>).



## 5. Configure Build Triggers

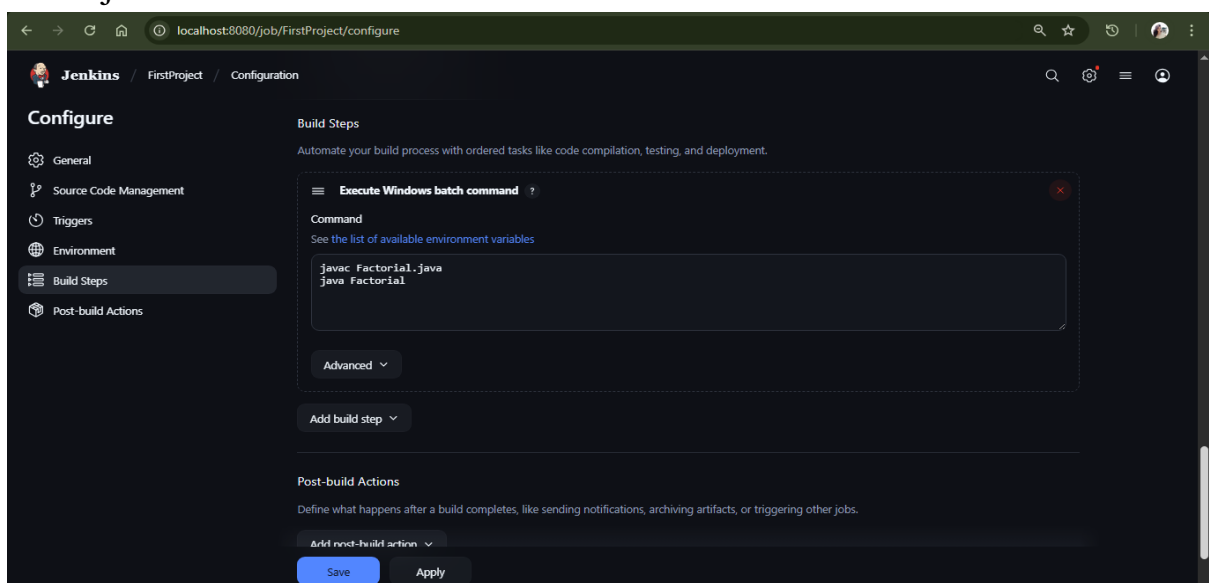
- Enable **Poll SCM** or **Build periodically** as needed.
- Alternatively, configure **GitHub webhook** for automatic builds.



## 6. Define Build Steps

- Go to **Build** section.
- Select appropriate build step (e.g., Execute shell, Invoke Maven targets).
- Example build command:

```
mvn clean install
javac filename.java
java filename
```

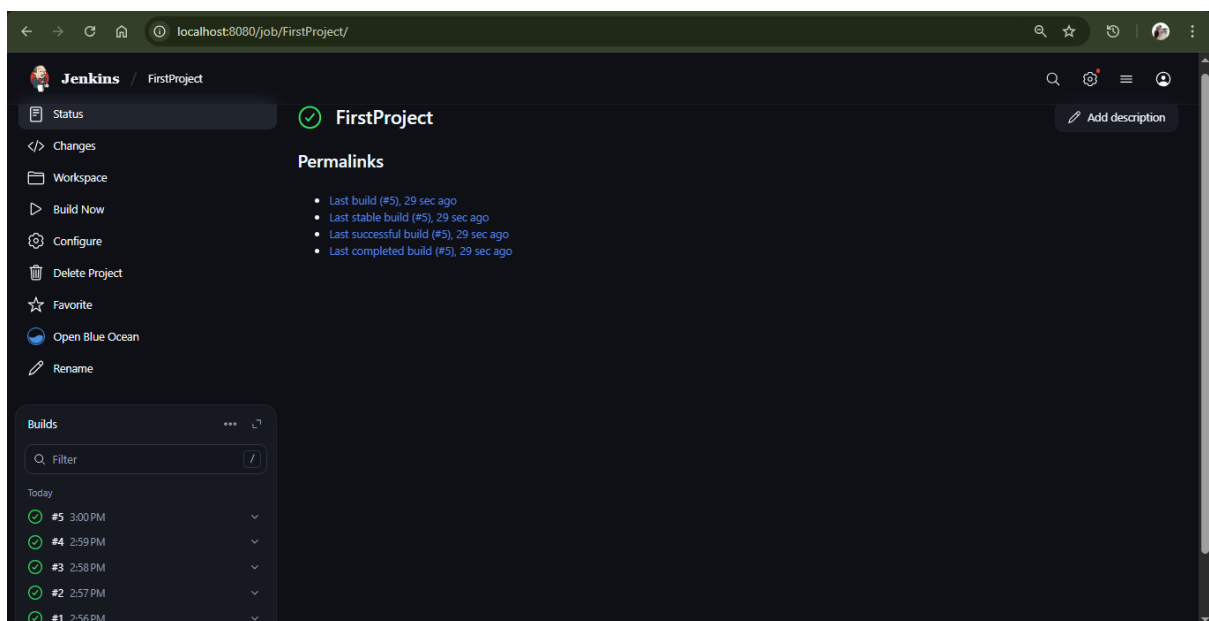


## 7. Optional: Post-build Actions

- Add post-build steps like:
    - Archive artifacts
    - Email notifications
- 

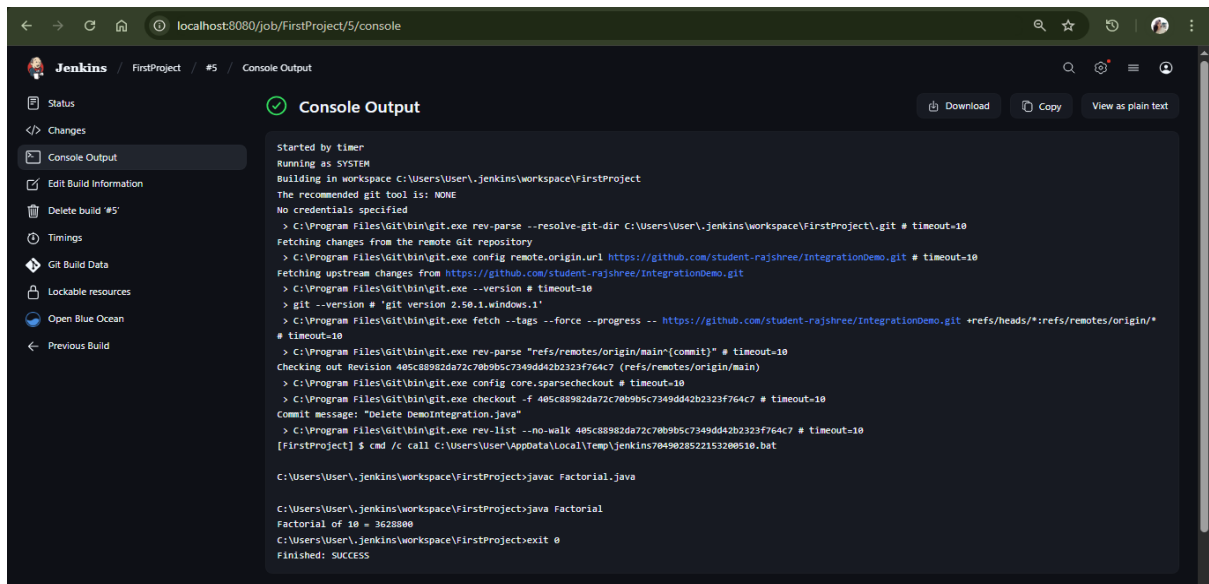
## 8. Save and Build

- Save the project.
- Click **Build Now**.
- Monitor the build process in **Build History**.



## 9. View Console Output

- Click on build number.
- View **Console Output** to check build logs.



The screenshot shows the Jenkins web interface for a build named 'FirstProject' / '#5'. The 'Console Output' tab is selected, displaying a log of the build process. The build starts by running as SYSTEM in the workspace C:\Users\User\.jenkins\workspace\FirstProject. It then proceeds to clone a repository from GitHub, fetch upstream changes, and checkout a specific commit. The build message is 'Delete DemoIntegration.java'. Finally, it runs a Java program 'Factorial.java' which outputs 'Factorial of 10 = 3628800'. The build finishes successfully.

```
Started by timer
Running as SYSTEM
Building in workspace C:\Users\User\.jenkins\workspace\FirstProject
The recommended git tool is: NONE
No credentials specified
> C:\Program Files\Git\bin\git.exe rev-parse --resolve-git-dir C:\Users\User\.jenkins\workspace\FirstProject\.git # timeout=10
Fetching changes from the remote Git repository
> C:\Program Files\Git\bin\git.exe config remote.origin.url https://github.com/student-rajshree/IntegrationDemo.git # timeout=10
Fetching upstream changes from https://github.com/student-rajshree/IntegrationDemo.git
> C:\Program Files\Git\bin\git.exe --version # timeout=10
> git --version # 'git version 2.50.1.windows.1'
> C:\Program Files\Git\bin\git.exe fetch --tags --force --progress -- https://github.com/student-rajshree/IntegrationDemo.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> C:\Program Files\Git\bin\git.exe rev-parse "refs/remotes/origin/main^{commit}" # timeout=10
Checking out Revision 405c88982da72c70b9b5c7349dd42b2323f764c7 (refs/remotes/origin/main)
> C:\Program Files\Git\bin\git.exe config core.sparsecheckout # timeout=10
> C:\Program Files\Git\bin\git.exe checkout -f 405c88982da72c70b9b5c7349dd42b2323f764c7 # timeout=10
Commit message: "Delete DemoIntegration.java"
> C:\Program Files\Git\bin\git.exe rev-list --no-walk 405c88982da72c70b9b5c7349dd42b2323f764c7 # timeout=10
[FirstProject] $ cmd /c call C:\Users\User\AppData\Local\Temp\Jenkins7049028522153200510.bat

C:\Users\User\.jenkins\workspace\FirstProject> javac Factorial.java

C:\Users\User\.jenkins\workspace\FirstProject> java Factorial
Factorial of 10 = 3628800
C:\Users\User\.jenkins\workspace\FirstProject> exit 0
Finished: SUCCESS
```

## 10. Automate Deployment (Optional)

- Add shell scripts or deployment tasks as build steps to automate deployment after build.