

User Manual

Introduction

This user manual provides step-by-step instructions for using the Jenkins Continuous Integration (CI) system implemented in this project. It explains how to access Jenkins, run jobs, view build results, and manage pipelines.

Accessing Jenkins

Steps:

1. Open a web browser.
2. Enter the Jenkins URL:

http://localhost:8080

3. Log in using the administrator credentials (Enrolment Number as username).

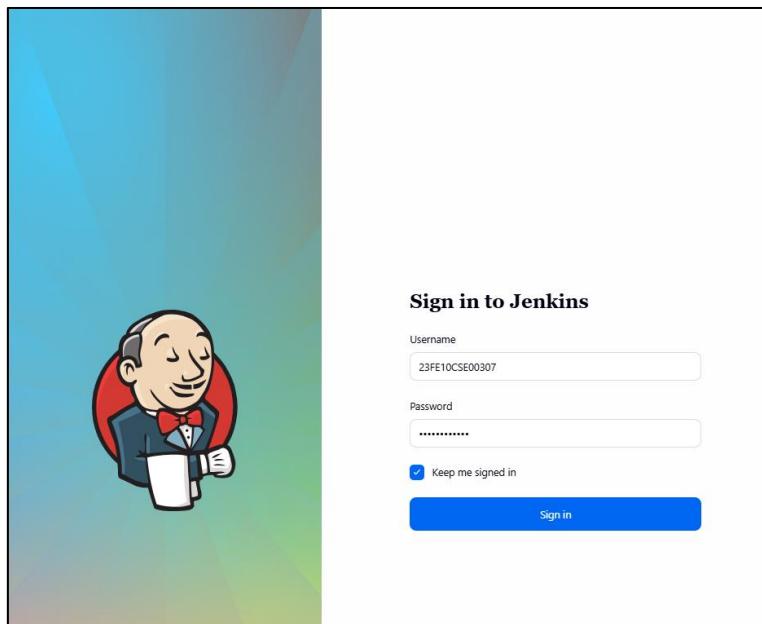


Figure 1. Jenkins login page

Dashboard Navigation

After logging in, the Jenkins dashboard is displayed.

Main features of the dashboard:

- **New Item:** Create new jobs
- **Build History:** View previous builds
- **Manage Jenkins:** Configure system settings
- **Job List:** Displays all configured jobs

The Jenkins dashboard displays a list of jobs. The 'Build Queue' section shows 'No builds in the queue.' The 'Builder Executor Status' section indicates '(0 of 2 executors busy)'. The main job list includes:

S	W	Name	Last Success	Last Failure	Last Duration
		Freestyle-CI-Job	23 min (#19)	34 min (#17)	4.9 sec
		Multibranch-CI-Pipeline	2 min 9 sec (#18)	N/A	5.2 sec

Icons at the bottom left include S, M, L. A search bar and 'Add description' button are at the top right.

Figure 2. Jenkins dashboard with job list

Running a Freestyle Job

Steps:

1. Click on the Freestyle job name.
2. Click **Build Now**.
3. Jenkins starts executing the job.
4. Click on the build number to view details.

The Freestyle-CI-Job page includes a sidebar with options like Status, Changes, Workspace, Build Now, Configure, Delete Project, Email Template Testing, Git Polling Log, Favorite, Open Blue Ocean, and Rename. The main area features a 'Test Result Trend' chart showing a series of red dots at the value of 5 from build #11 to #24. Below the chart are sections for 'Last Successful Artifacts' (calculator-1.0-SNAPSHOT.jar, 2.28 kB, view) and 'Latest Test Result (no failures)'. A 'Permalinks' section lists recent builds. At the bottom, a 'Builds >' dropdown shows builds from January 31, 2023, with entries for #24 through #20.

Figure 3. Freestyle job page with “Build Now” option

Viewing Build Console Output

Steps:

1. Click on the build number (e.g., #1).
2. Click on **Console Output**.
3. Observe the logs for:
 - a. Code checkout
 - b. Build execution
 - c. Test results

Figure 4. Console Output showing successful build

Running Multibranch Pipeline Job

Steps:

1. Click on the Multibranch Pipeline job.
 2. Jenkins automatically displays discovered branches.
 3. Click any branch to view its pipeline.
 4. Click **Build Now** to trigger a pipeline run.

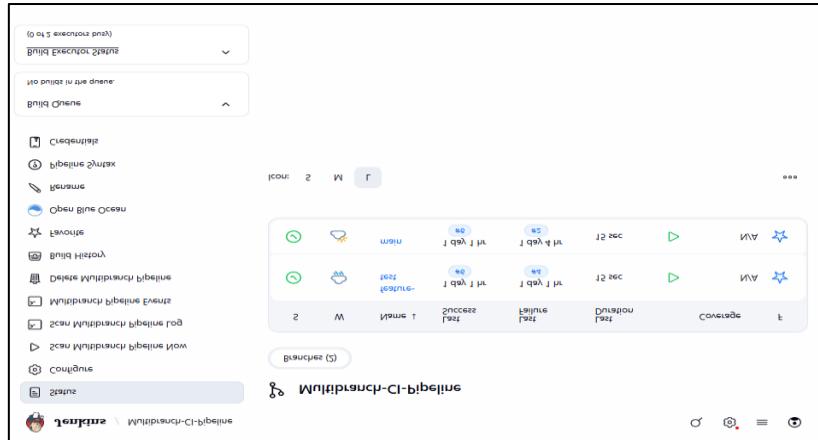


Figure 5. Multibranch Pipeline job showing branches

Viewing Pipeline Stages

Steps:

1. Click on a pipeline build.
 2. View the stage-wise execution (Checkout, Build, Test, Deploy).
 3. Click on any stage to view logs.

The screenshot shows a Jenkins pipeline stage view titled "Multibranch-CI-Pipeline". The table lists 14 build runs across various branches (feature-test, main). The columns include STATUS, RUN, COMMIT, BRANCH, MESSAGE, DURATION, and COMPLETED. Most runs are successful (green checkmark), while some are failed (red X). The last two rows show "Branch indexing" builds.

STATUS	RUN	COMMIT	BRANCH	MESSAGE	DURATION	COMPLETED
✓	6	dee078a	feature-test	Refactor code structure f... (5 commits)	16s	a day ago
✓	6	d87cab5	main	Refactor code structure f... (4 commits)	16s	a day ago
✓	5	493b686	feature-test	Add environment variables for Java s...	13s	a day ago
✗	4	4c5561e	feature-test	Started by user Deep Kiran Kaur	6s	a day ago
✗	3	4c5561e	feature-test	Started by user Deep Kiran Kaur	7s	a day ago
✓	5	8343d43	main	changes in README.md	11s	a day ago
✓	4	3b662cb	main	Add installation guide for Jenkins set...	27s	a day ago
✓	3	bda9577	main	Fix JAVA_HOME in Jenkinsfile for pi...	13s	a day ago
✗	2	4c5561e	feature-test	changes in README.md	7s	a day ago
✗	2	365c97d	main	Started by user Deep Kiran Kaur	8s	a day ago
✗	1	365c97d	feature-test	Branch indexing	8s	a day ago
✗	1	365c97d	main	Branch indexing	10s	a day ago

Figure 6.Pipeline stage view (Blue Ocean)

Viewing Test Results

Steps:

1. Open a completed build.
2. Click on **Test Result**.
3. View passed and failed test cases.

The screenshot shows a Jenkins test results page for a "Freestyle-CI-Job". The top bar indicates 24 total tests, with 10s duration and changes by "ldeepkirankaur". A summary message says "All tests are passing". Below, a table lists 5 passed tests under the heading "Passed - 5".

Test Case	Duration
> testDivideByZero - com.muj.ci.CalculatorTest	<1s
> testAdd - com.muj.ci.CalculatorTest	<1s
> testSubtract - com.muj.ci.CalculatorTest	<1s
> testDivide - com.muj.ci.CalculatorTest	<1s
> testMultiply - com.muj.ci.CalculatorTest	<1s

Figure 7.Test Results page

Downloading Build Artifacts

Steps:

1. Open a completed build.
2. Click on **Artifacts**.
3. Download generated files.

The screenshot shows the Jenkins interface for a job named 'Freestyle-CI-Job'. At the top, there's a green header bar with the job name, a timestamp of '10s' ago, and a note that it was 'Started by an SCM change'. Below this, the 'Artifacts' tab is selected. A table lists two artifacts: 'pipeline.log' (2.3 KB) and 'target/calculator-1.0-SNAPSHOT.jar'. Each artifact has a download icon. At the bottom of the artifacts section is a 'Download All' button.

Figure 8. Artifacts section

Triggering Builds Automatically

Builds can be triggered automatically by:

- Pushing code to GitHub (via webhook)
- Polling SCM schedule
- Branch indexing in Multibranch Pipeline

This ensures Continuous Integration without manual intervention.

Logging Out

Steps:

1. Click on the username at the top-right corner.
2. Click **Log out**.

Summary

This user manual enables users to effectively operate the Jenkins CI system. It covers login, job execution, pipeline monitoring, and result analysis. Using these steps, users can continuously integrate and test their code using Jenkins.