

UNIT III CONTINUOUS INTEGRATION USING JENKINS**6**

Install & Configure Jenkins, Jenkins Architecture Overview, Creating a Jenkins Job, Configuring a Jenkins job, Introduction to Plugins, Adding Plugins to Jenkins, Commonly used plugins (Git Plugin, Parameter Plugin, HTML Publisher, Copy Artifact and Extended choice parameters). Configuring Jenkins to work with java, Git and Maven, Creating a Jenkins Build and Jenkins workspace.

CREATING AND CONFIGURING A JENKINS JOB

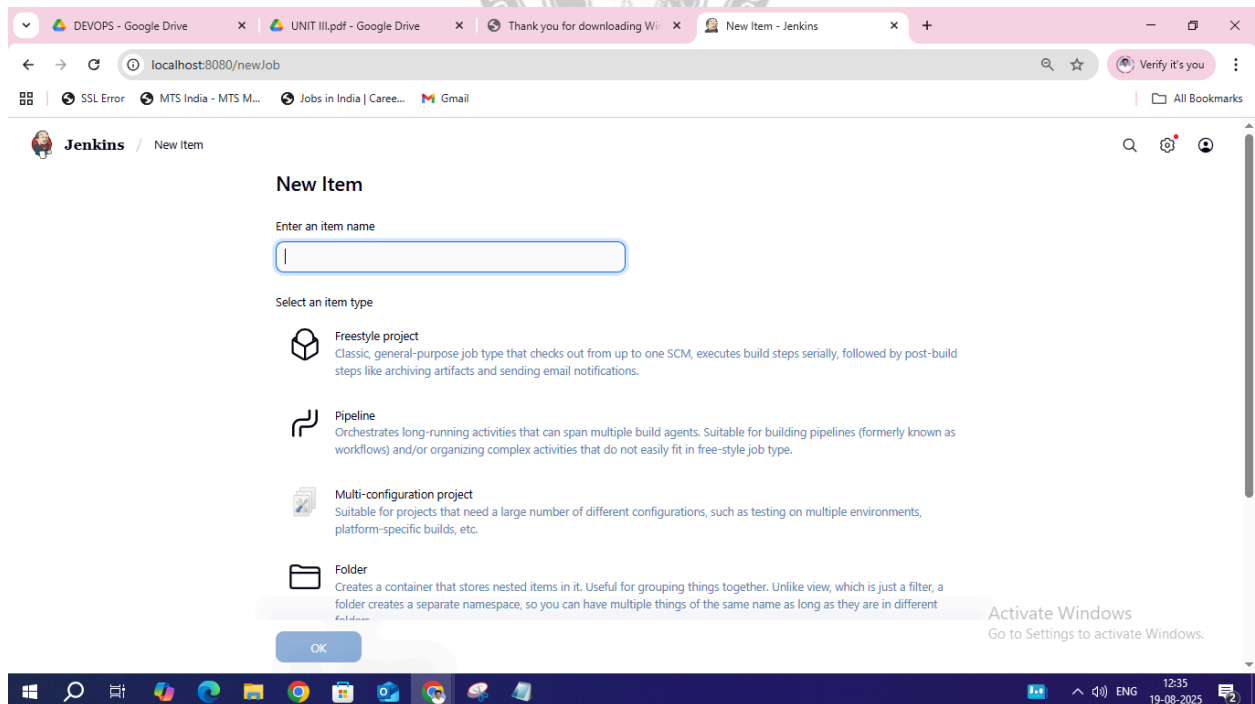
In Jenkins, Jobs (also called Projects) represent tasks or automated processes. These tasks often involve building software, running tests, deploying applications, or performing any other repetitive task that can be automated.

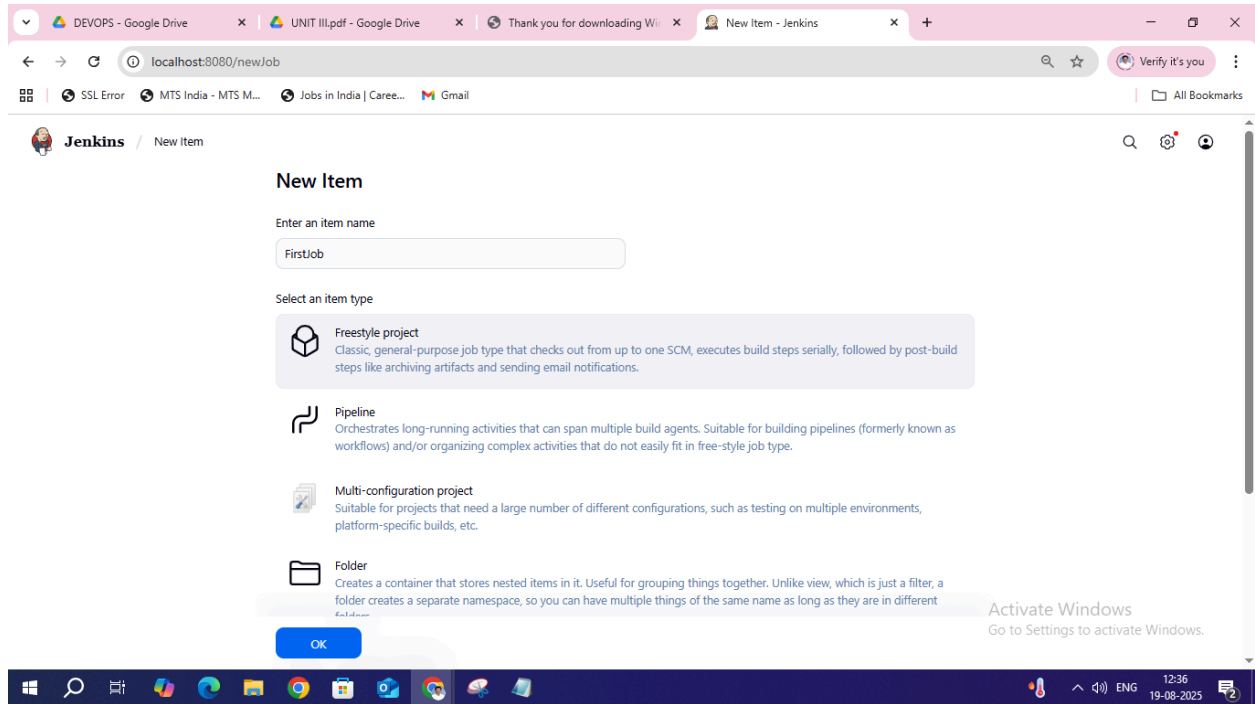
Jobs are at the core of Jenkins' functionality, enabling continuous integration and continuous delivery (CI/CD) pipelines.

Jobs include triggers, build steps, and post-build actions, enabling streamlined automation in development workflows. Jenkins job is created by using the following steps.

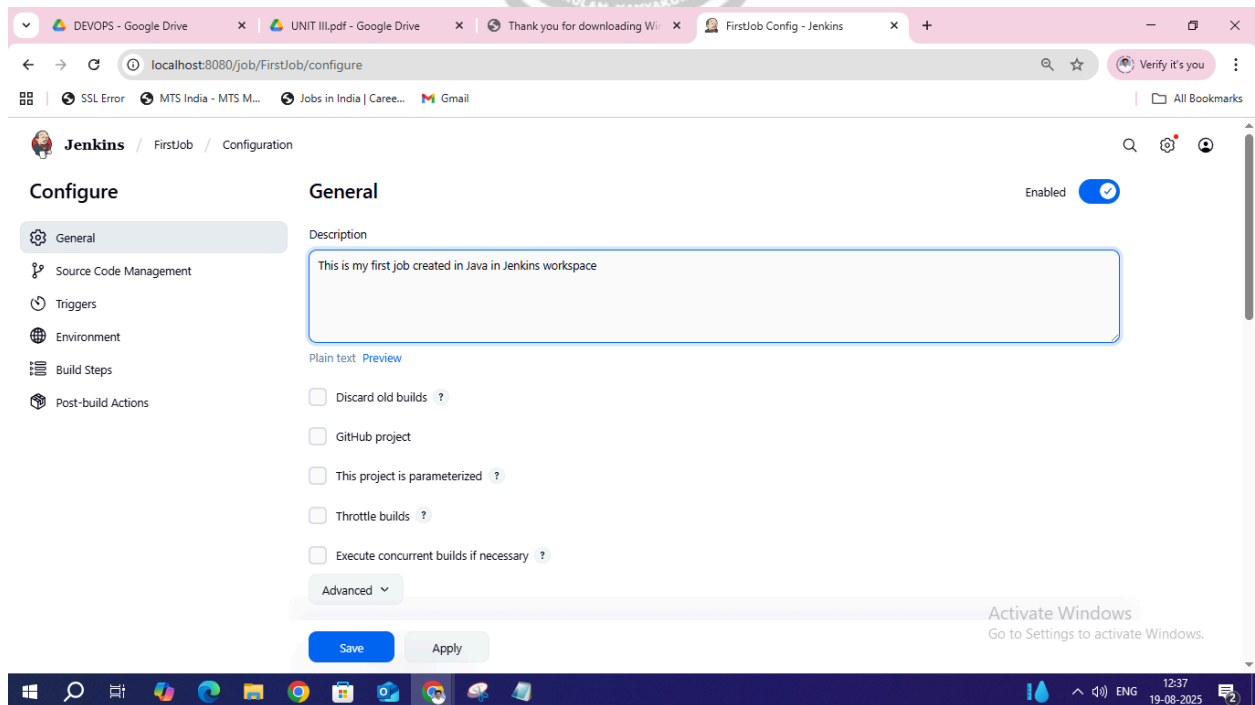
Step 1: Open Jenkins dashboard in browser by typing localhost:8080

Step 2: Create a free style project by clicking New Item and provide the name and click OK

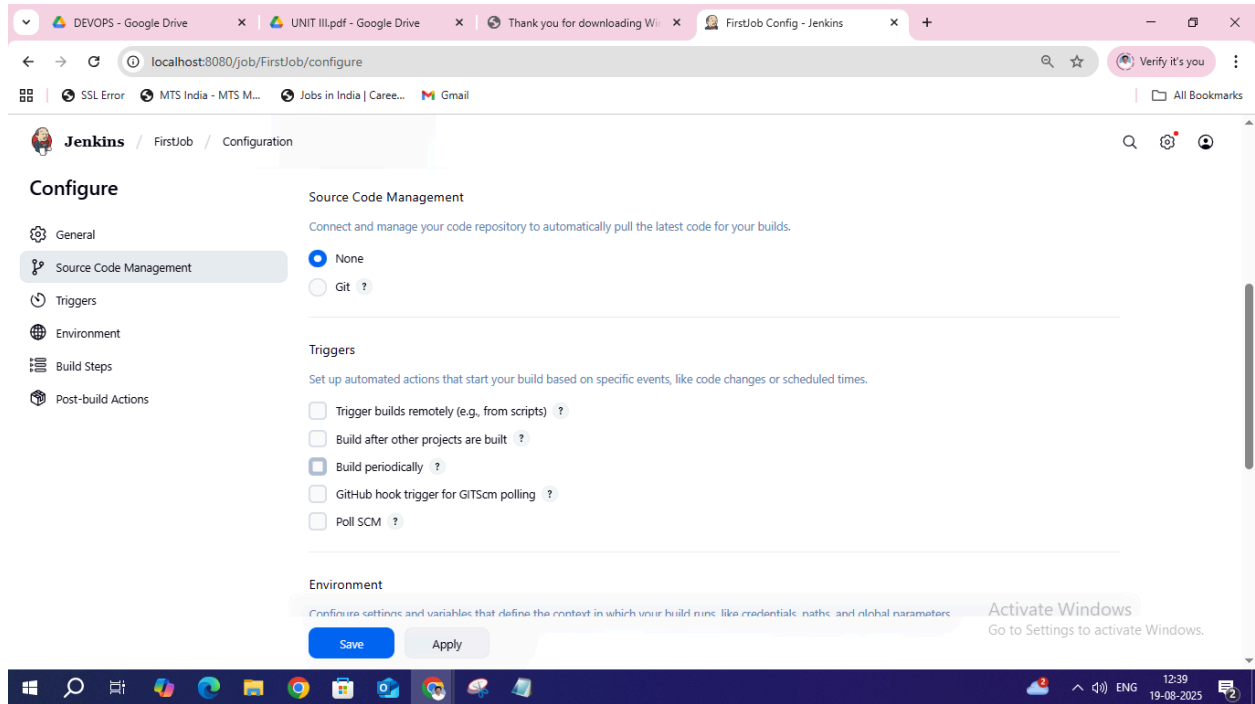




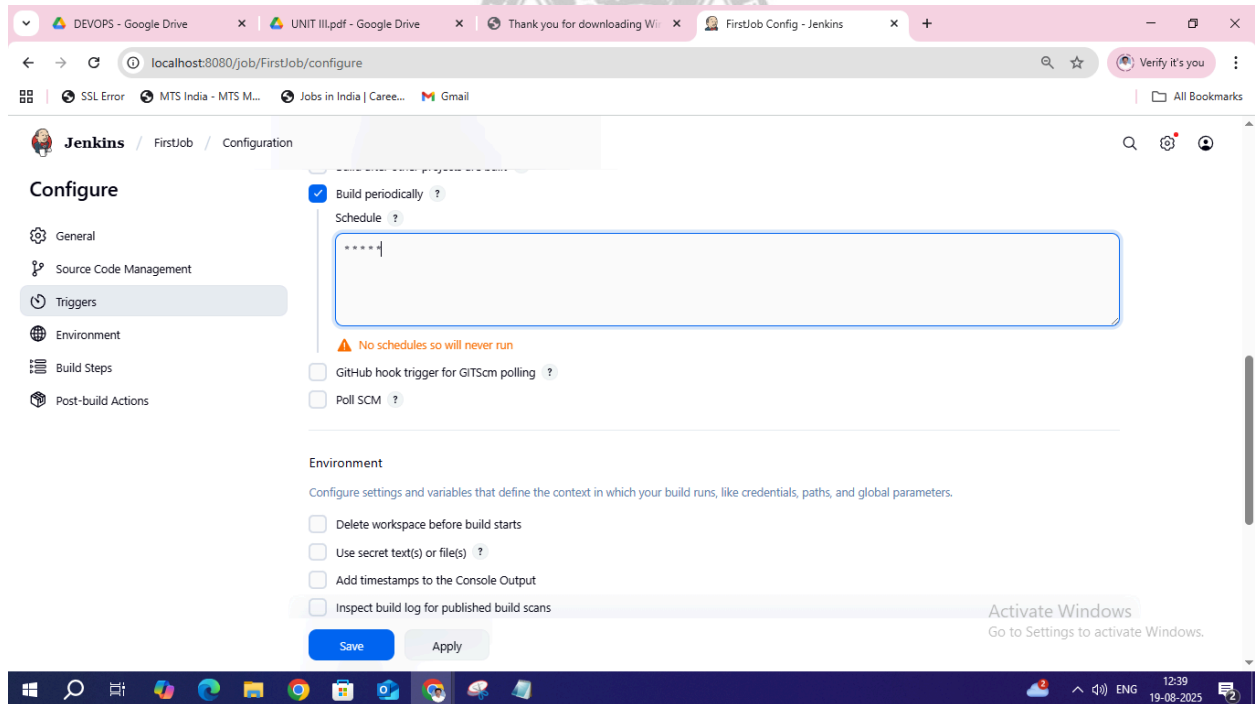
Step 3: Configure the project as follows:
Provide the description



Step 4: In the source code management, specify the location of the source code.



Step 5: In the triggers sections, specify the expression to do periodic build action.



Step 6: In the build sections, specify the steps that you want Jenkins to perform when the job is run. Type the java commands to execute the java program

The screenshot shows the Jenkins web interface in a browser. The address bar indicates the URL is `localhost:8080/job/FirstJob/configure`. The page title is "Jenkins / FirstJob / Configuration". On the left sidebar, the "Environment" tab is selected. The main content area is titled "Configure" and includes sections for "General", "Source Code Management", "Triggers", "Build Steps", and "Post-build Actions". The "Build Steps" section is active, showing a description: "Automate your build process with ordered tasks like code compilation, testing, and deployment." Below this, there is an "Add build step" button and a dropdown menu. The dropdown menu is open, displaying a list of build steps: "Execute Windows batch command", "Execute shell", "Invoke Ant", "Invoke Gradle script", "Invoke top-level Maven targets", "Run with timeout", and "Set build status to 'pending' on GitHub commit". The "Execute shell" option is highlighted. At the bottom right, there is an "Activate Windows" watermark.

This is a duplicate of the screenshot above, showing the same Jenkins configuration page for "FirstJob". The "Build Steps" section is active, and the "Add build step" dropdown menu is open, with "Execute shell" highlighted. The interface elements, including the sidebar, address bar, and watermarks, are identical to the first screenshot.

The screenshot shows the Jenkins web interface in a browser. The address bar indicates the URL is `localhost:8080/job/FirstJob/configure`. The page title is "Jenkins / FirstJob / Configuration". On the left sidebar, the "Configure" tab is selected, showing a list of configuration options: General, Source Code Management, Triggers, Environment, Build Steps, and Post-build Actions. The main content area is titled "Configure" and contains a text box for build steps with the following code:

```
javac FirstJob.java
java FirstJob
```

Below the build steps section, there is a "Post-build Actions" section with a description: "Define what happens after a build completes, like sending notifications, archiving artifacts, or triggering other jobs." At the bottom of the configuration page, there are two buttons: "Save" and "Apply". A Windows watermark is visible in the bottom right corner.

Step 7: Click Apply and Save

This screenshot is identical to the one above, showing the Jenkins configuration page for "FirstJob". However, a green confirmation message "Saved" is now visible in the bottom left corner of the page, indicating that the configuration has been successfully saved. The "Save" button is highlighted in blue, and the "Apply" button is in light blue.

The screenshot displays the Jenkins web interface for a job named 'FirstJob'. The browser tabs include 'DEVOPS - Google Drive', 'UNIT III.pdf - Google Drive', 'Thank you for downloading W...', and 'FirstJob - Jenkins'. The address bar shows 'localhost:8080/job/FirstJob/'. The Jenkins interface shows the job's status, workspace, and build history. Below the Jenkins interface, a Windows File Explorer window is open, showing the file structure of the job's workspace. The file explorer shows two files: 'FirstJob.class' (1 KB, CLASS File) and 'FirstJob' (1 KB, Java Source File). The taskbar at the bottom shows the system clock at 12:45 on 19-08-2025.

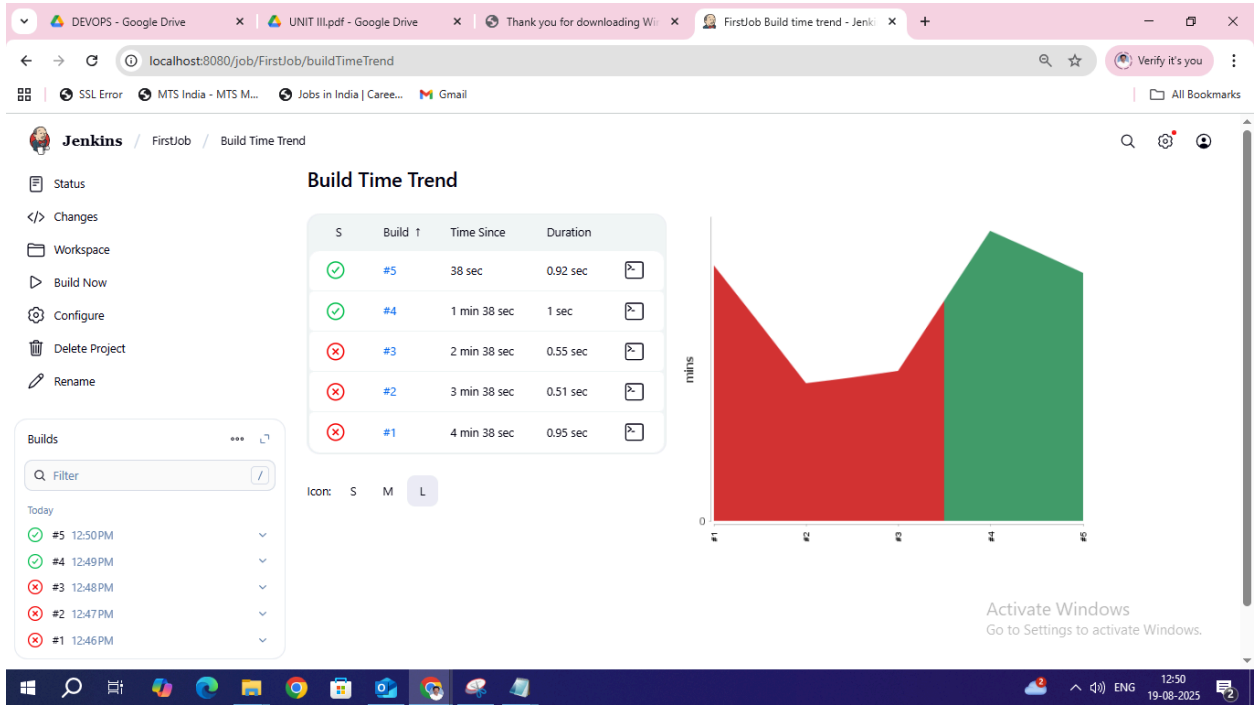
Activate Windows
Go to Settings to activate Windows.
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File Explorer: This PC > Local Disk (C:) > ProgramData > Jenkins > .jenkins > workspace > FirstJob

Name	Date modified	Type	Size
FirstJob.class	19-08-2025 12:49	CLASS File	1 KB
FirstJob	19-08-2025 12:48	Java Source File	1 KB

```
public class FirstJob
{
    public static void main(String args[])
    {
        System.out.println("First Java Program in Jenkins");
    }
}
```

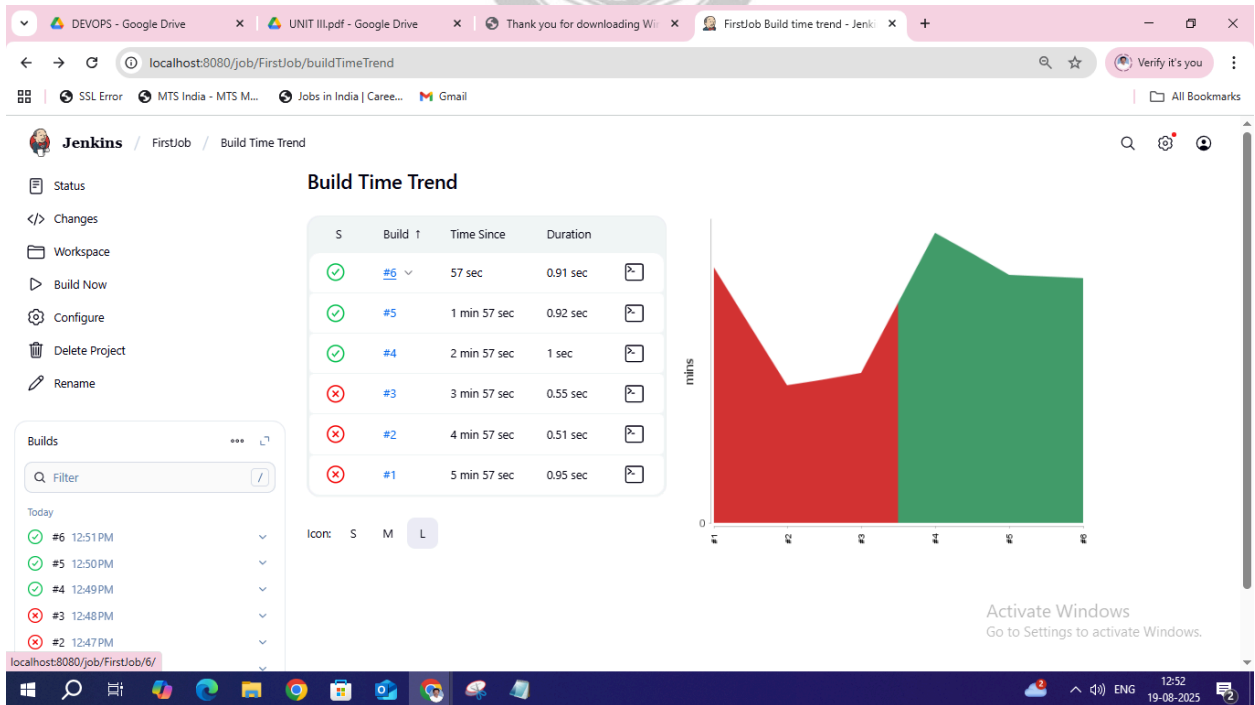
Step 8: Check the status of the build by clicking on the build number



The screenshot shows the Jenkins 'Build Time Trend' page for 'FirstJob'. The left sidebar contains navigation links: Status, Changes, Workspace, Build Now, Configure, Delete Project, and Rename. The 'Builds' section on the left lists builds #1 to #5 with their respective times. The main area displays a table of build details and a corresponding area chart.

S	Build ↑	Time Since	Duration
✓	#5	38 sec	0.92 sec
✓	#4	1 min 38 sec	1 sec
✗	#3	2 min 38 sec	0.55 sec
✗	#2	3 min 38 sec	0.51 sec
✗	#1	4 min 38 sec	0.95 sec

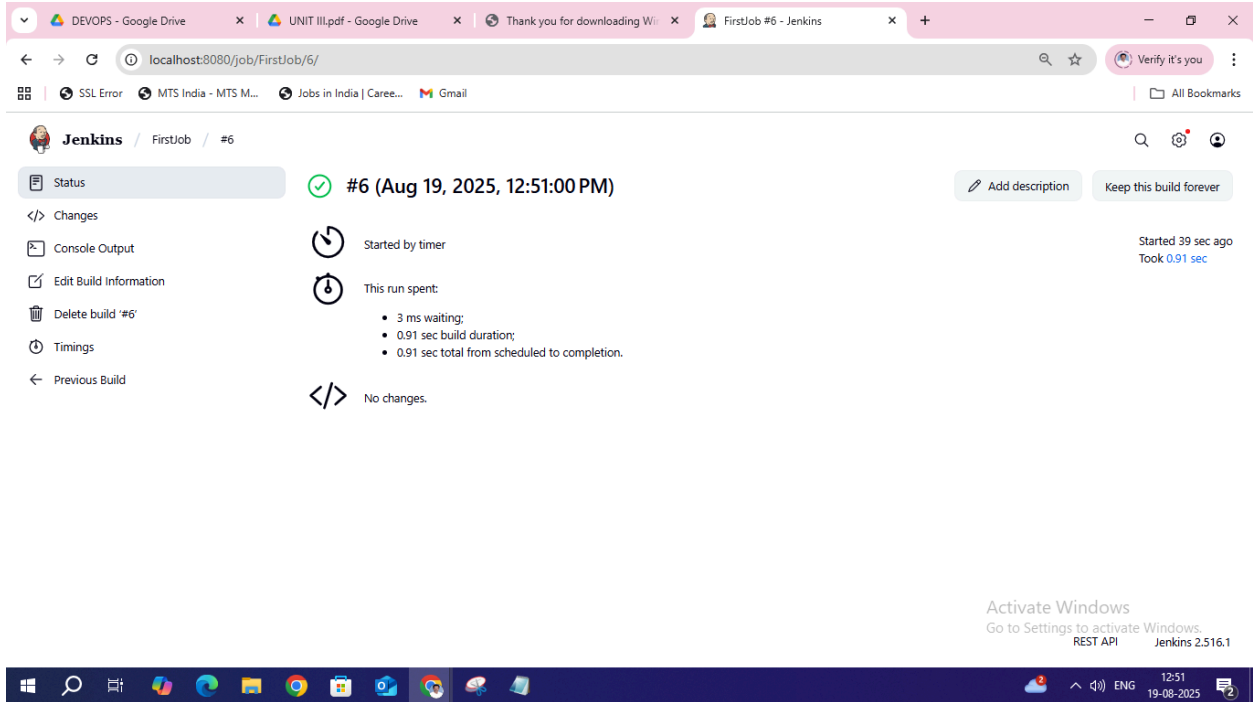
The area chart on the right shows the build time trend over time, with the y-axis labeled 'mins' and the x-axis showing time intervals. The chart is divided into red and green sections, indicating different build statuses.



The screenshot shows the Jenkins 'Build Time Trend' page for 'FirstJob' after clicking on build #6. The 'Builds' section on the left now lists builds #1 to #6. The main area displays a table of build details and a corresponding area chart.

S	Build ↑	Time Since	Duration
✓	#6	57 sec	0.91 sec
✓	#5	1 min 57 sec	0.92 sec
✓	#4	2 min 57 sec	1 sec
✗	#3	3 min 57 sec	0.55 sec
✗	#2	4 min 57 sec	0.51 sec
✗	#1	5 min 57 sec	0.95 sec

The area chart on the right shows the build time trend over time, with the y-axis labeled 'mins' and the x-axis showing time intervals. The chart is divided into red and green sections, indicating different build statuses.



The screenshot shows the Jenkins web interface for a job named 'FirstJob'. The build #6, dated August 19, 2025, at 12:51:00 PM, is in a successful state. The console output shows the build was started by a timer, running as SYSTEM. It executed a command to call a batch file, then compiled a Java file (FirstJob.java) and ran it. The build finished successfully.

Jenkins / FirstJob / #6

Status ✔ #6 (Aug 19, 2025, 12:51:00 PM)

Started by timer

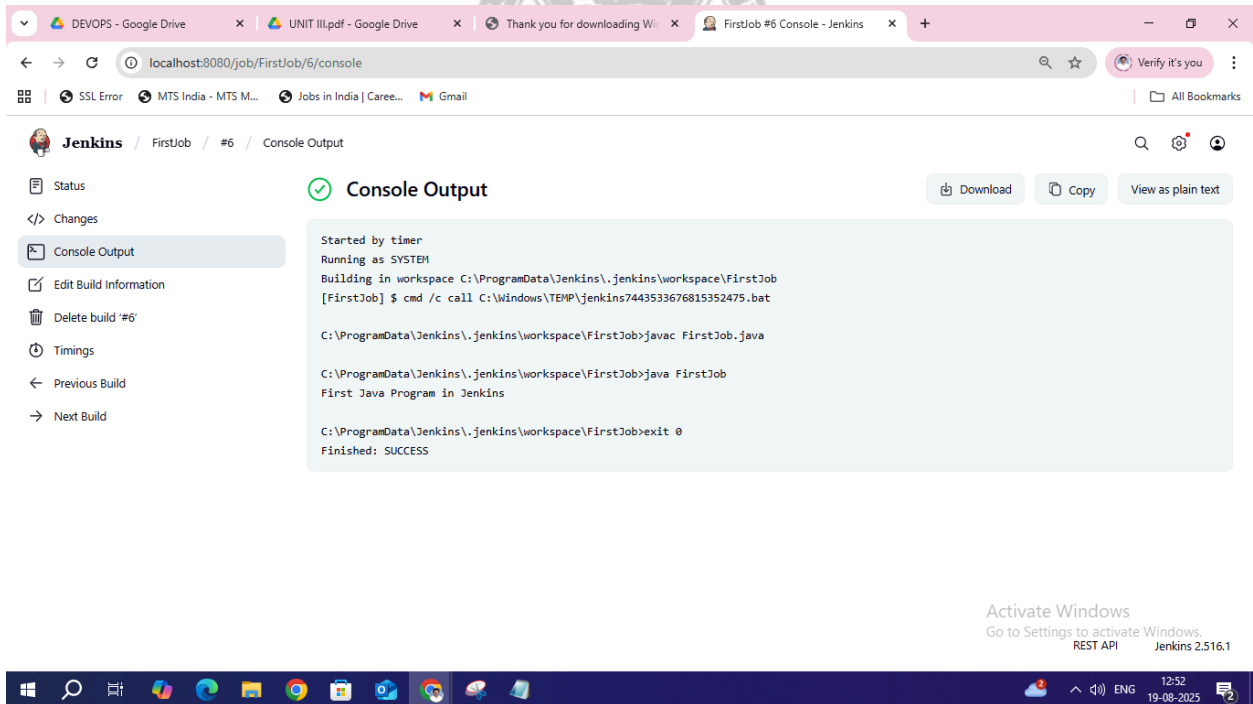
This run spent:

- 3 ms waiting;
- 0.91 sec build duration;
- 0.91 sec total from scheduled to completion.

No changes.

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Step 9: Check the output in Console Output



The screenshot shows the Jenkins web interface for the same job 'FirstJob', but now viewing the 'Console Output' tab. The build #6 is still successful. The console output shows the build was started by a timer, running as SYSTEM. It executed a command to call a batch file, then compiled a Java file (FirstJob.java) and ran it. The build finished successfully.

Jenkins / FirstJob / #6 / Console Output

Status ✔ Console Output

Started by timer

Running as SYSTEM

Building in workspace C:\ProgramData\Jenkins\jenkins\workspace\FirstJob

[FirstJob] \$ cmd /c call C:\Windows\TEMP\jenkins7443533676815352475.bat

C:\ProgramData\Jenkins\jenkins\workspace\FirstJob>javac FirstJob.java

C:\ProgramData\Jenkins\jenkins\workspace\FirstJob>java FirstJob

First Java Program in Jenkins

C:\ProgramData\Jenkins\jenkins\workspace\FirstJob>exit 0

Finished: SUCCESS

Activate Windows
Go to Settings to activate Windows.
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