DEPARTMENT OF INFORMATION TECHNOLOGY

Semester	S.E. Semester IV – Information Technology Engineering
Subject	Computer Networks and Network Design Lab
Subject Professor In-charge	Unnati Gohil
Assisting Teachers	-
Laboratory	MS Teams

Student Name	Sanika Kate	
Roll Number	22101A2005	
Grade and Subject Teacher's Signature		

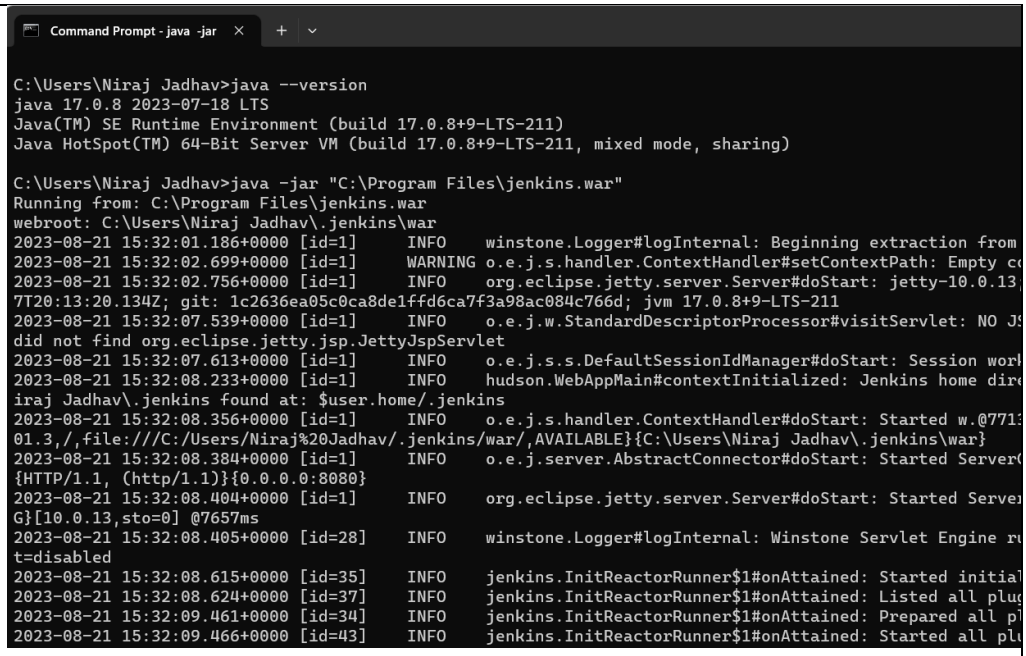
Experiment Number	4	
Experiment Title	Installation of Jenkins	
Resources / Apparatus Required	Hardware: Basic Desktop with Windows or Linux.	Software: Java/ Python/Wireshark/Cisco Packet Tracer
Objectives (Skill Set / Knowledge Tested / Imparted)		
Theory:	**What is Jenkins** Jenkins is an open-source continuous integration/continuous delivery and deployment (CI/CD) automation software DevOps tool written in	

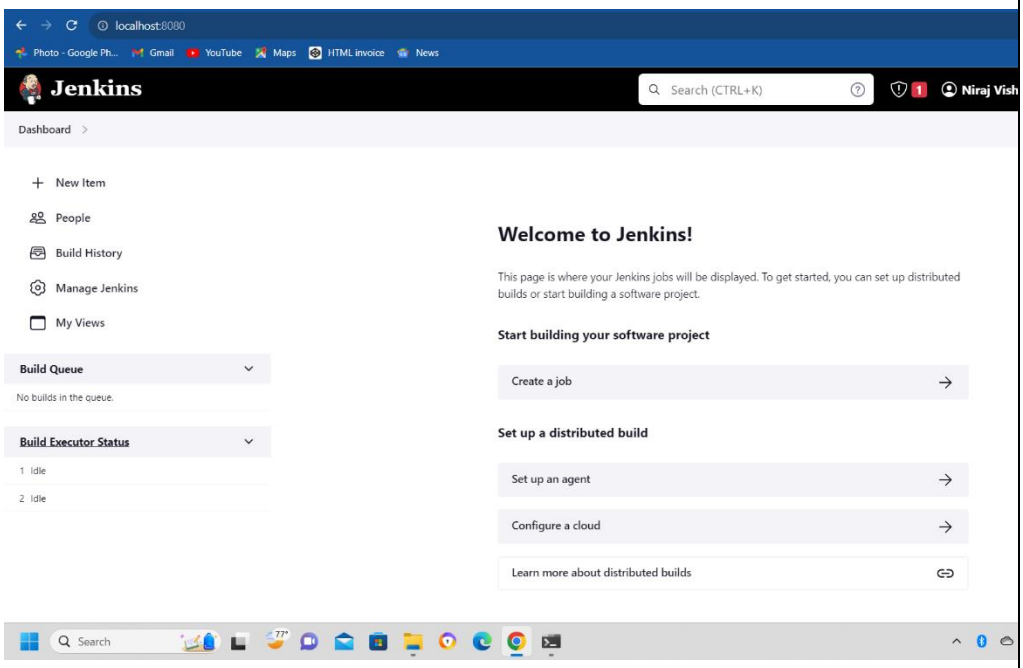
	the Java programming language. It is used to implement CI/CD workflows, called pipelines. Pipelines automate testing and reporting on isolated changes in a larger code base in real time and facilitates the integration of disparate branches of the code into a main branch. They also rapidly detect defects in a code base, build the software, automate testing of their builds, prepare the code base for deployment (delivery), and ultimately deploy code to containers and virtual machines, as well as bare metal and cloud servers. **Jenkins Plugin:** A plugin is an enhancement to the Jenkins system. They help extend Jenkins capabilities and integrated Jenkins with other software. Plugins can be downloaded from the online Jenkins Plugin repository and loaded using the Jenkins Web UI or CLI. Currently, the Jenkins community claims over 1500 plugins available for a wide range of uses. Plugins help to integrate other developer tools into the Jenkins environment, add new user interface elements to the Jenkins Web UI, help with administration of Jenkins, and enhance Jenkins for build and source code management. One of the more common uses of plugins is to provide integration points for CI/CD sources and destinations. **Configuration Requirement for Jenkins** 1. System Requirements: Ensure that your Jenkins server meets the hardware and software requirements outlined in the official documentation for your operating system. 2. Java: Jenkins is a Java application, so make sure you have Java installed on your system. Jenkins typically requires Java 8 or later. 3. Jenkins Installation:

	Install Jenkins following the official installation guide for your platform. 4. Plugins: Jenkins relies on plugins to extend its functionality. Install the necessary plugins for your project or environment. Common plugins include Git, Docker, and various CI/CD plugins. **CI/CD:** CI/CD stands for Continuous Integration and Continuous Deployment (or Continuous Delivery), which are two essential practices in modern software development and DevOps. They help streamline the development and release processes, making them more efficient, reliable, and automated. Continuous Integration (CI): 1. Integration: CI focuses on the frequent integration of code changes into a shared repository by multiple developers. Each developer's code changes are regularly merged into the main codebase, ensuring that the entire codebase is always up-to-date. 2. Automated Testing: After code integration, CI systems automatically run a series of tests (unit tests, integration tests, and other forms of testing) to catch bugs and ensure that the new code doesn't introduce regressions. 3. Immediate Feedback: CI provides immediate feedback to developers. If a test fails or a code integration issue arises, developers are notified quickly, allowing them to address problems early in the development process. 4. Benefits: It improves code quality, reduces integration issues, and speeds up development. Continuous Deployment (CD): 5. Deployment Automation: CD extends the CI pipeline by automating the deployment process. Once code changes pass all tests, CD systems automatically deploy them to production or staging environments. 6. Continuous Delivery: In Continuous Delivery (often used interchangeably with Continuous Deployment), code changes are automatically deployed to staging environments but require

	manual approval for production deployment. In Continuous Deployment, code changes are automatically deployed to production without manual intervention. **To install Jenkins on Windows using the Jenkins.war file, follow these steps:** 1. Install Java: Jenkins is a Java-based application, so you need Java installed on your Windows machine. If you haven't already, download and install the latest Java Development Kit (JDK) from the official Oracle website or adopt OpenJDK. 2. Download Jenkins.war: Go to the Jenkins official website (https://www.jenkins.io/download/) and download the Jenkins.war file. Make sure to get the latest stable version. 3. Create a Jenkins Home Directory: Create a directory on your system where Jenkins will store its data and configuration. You can choose any directory you like, but for this example, let's assume you create a folder called C:\Jenkins. 4. Open Command Prompt: Press Win + R, type "cmd," and press Enter to open a Command Prompt. 5. Navigate to the Directory: Use the cd command to navigate to the directory where you downloaded the Jenkins.war file cd C:\Path\To\Jenkins 6. Run Jenkins: Start Jenkins by running the following command, specifying the path to the Jenkins.war file: java -jar jenkins.war 7. Access Jenkins:

	After running the command, Jenkins will start and display log output in the Command Prompt. Wait until you see a message similar to "Jenkins is fully up and running" in the logs. Open a web browser and go to http://localhost:8080. Jenkins should be accessible through this address by default. If port 8080 is already in use, Jenkins will use a different port, which will be displayed in the logs. You can access it at http://localhost:<port_number>. 8. Unlock Jenkins: To set up Jenkins, you'll need to retrieve the initial admin password. This password can be found in the Jenkins startup logs in the Command Prompt. Look for a line that says "Please use the following password to proceed to installation" and copy the password. Paste the password into the Jenkins web interface to unlock Jenkins. 9. Customize Jenkins: Follow the on-screen instructions to customize Jenkins. You can either install the recommended plugins or select specific plugins based on your needs. 10. Create Admin User: After plugin installation, you will be prompted to create an admin user for Jenkins. Fill in the required information. 11. Jenkins is Ready: Once the setup is complete, Jenkins is ready to use. You can start creating jobs, pipelines, and automate your CI/CD processes.
Output	


Command Prompt - java -jar
C:\Users\Niraj Jadhav>java --version
java 17.0.8 2023-07-18 LTS
Java(TM) SE Runtime Environment (build 17.0.8+9-LTS-211)
Java HotSpot(TM) 64-Bit Server VM (build 17.0.8+9-LTS-211, mixed mode, sharing)
C:\Users\Niraj Jadhav>java -jar "C:\Program Files\jenkins.war"
Running from: C:\Program Files\jenkins.war
webroot: C:\Users\Niraj Jadhav\.jenkins\war
2023-08-21 15:32:01.186+0000 [id=1] INFO winstone.Logger#logInternal: Beginning extraction from
2023-08-21 15:32:02.699+0000 [id=1] WARNING o.e.j.s.handler.ContextHandler#setContextPath: Empty c
2023-08-21 15:32:02.756+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: jetty-10.0.13
7T20:13:20.134Z; git: 1c2636ea05c0ca8de1ffd6ca7f3a98ac084c766d; jvm 17.0.8+9-LTS-211
2023-08-21 15:32:07.539+0000 [id=1] INFO o.e.j.w.StandardDescriptorProcessor#visitServlet: NO J
did not find org.eclipse.jetty.jsp.JettyJspServlet
2023-08-21 15:32:07.613+0000 [id=1] INFO o.e.j.s.s.DefaultSessionIdManager#doStart: Session work
2023-08-21 15:32:08.233+0000 [id=1] INFO hudson.WebAppMain#contextInitialized: Jenkins home dir
iraj Jadhav\.jenkins found at: $user.home/.jenkins
2023-08-21 15:32:08.356+0000 [id=1] INFO o.e.j.s.handler.ContextHandler#doStart: Started w.@771
01.3,/,file:///C:/Users/Niraj%20Jadhav/.jenkins/war/,AVAILABLE}{C:\Users\Niraj Jadhav\.jenkins\war}
2023-08-21 15:32:08.384+0000 [id=1] INFO o.e.j.server.AbstractConnector#doStart: Started Server
{HTTP/1.1, (http/1.1)}{0.0.0.0:8080}
2023-08-21 15:32:08.404+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: Started Serve
G}[10.0.13,sto=0] @7657ms
2023-08-21 15:32:08.405+0000 [id=28] INFO winstone.Logger#logInternal: Winstone Servlet Engine r
t=disabled
2023-08-21 15:32:08.615+0000 [id=35] INFO jenkins.InitReactorRunner$1#onAttained: Started initia
2023-08-21 15:32:08.624+0000 [id=37] INFO jenkins.InitReactorRunner$1#onAttained: Listed all plu
2023-08-21 15:32:09.461+0000 [id=34] INFO jenkins.InitReactorRunner$1#onAttained: Prepared all p
2023-08-21 15:32:09.466+0000 [id=43] INFO jenkins.InitReactorRunner$1#onAttained: Started all pl


localhost:8080
Photo - Google Ph...
Gmail
YouTube
Maps
HTML invoice
News
Jenkins
Search (CTRL+K)
Niraj Vish
Dashboard
New Item
People
Build History
Manage Jenkins
My Views
Build Queue
No builds in the queue.
Build Executor Status
1 Idle
2 Idle
Welcome to Jenkins!
This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.
Start building your software project
Create a job
Set up a distributed build
Set up an agent
Configure a cloud
Learn more about distributed builds
Search

Getting Started

Create First Admin User

Username

NirajJadhav01

Password

••••••••••

Confirm password

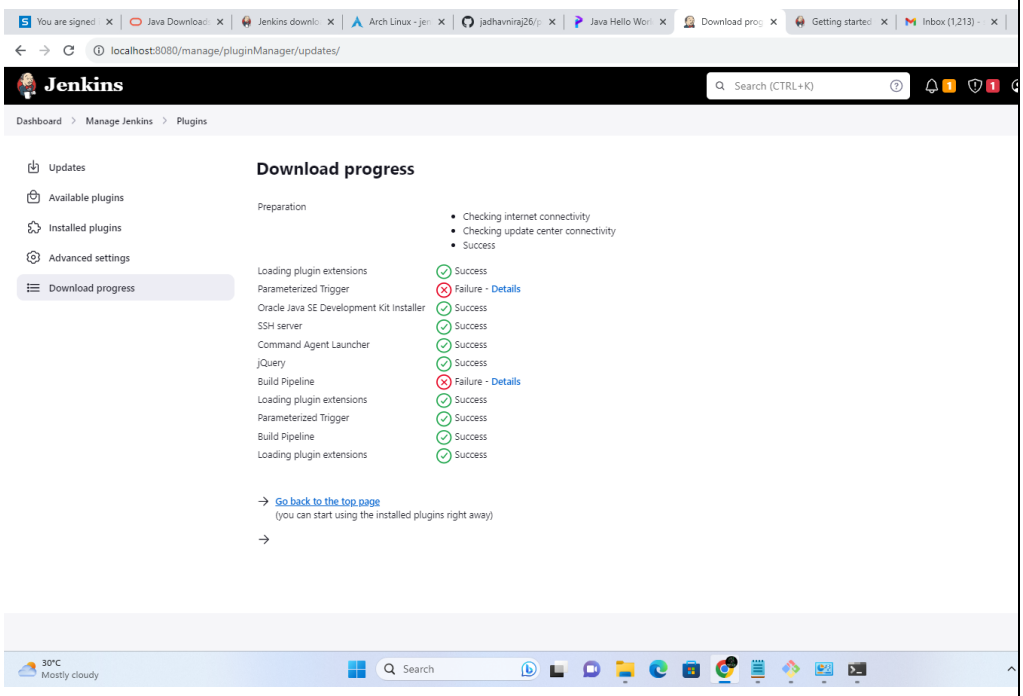
••••••••••

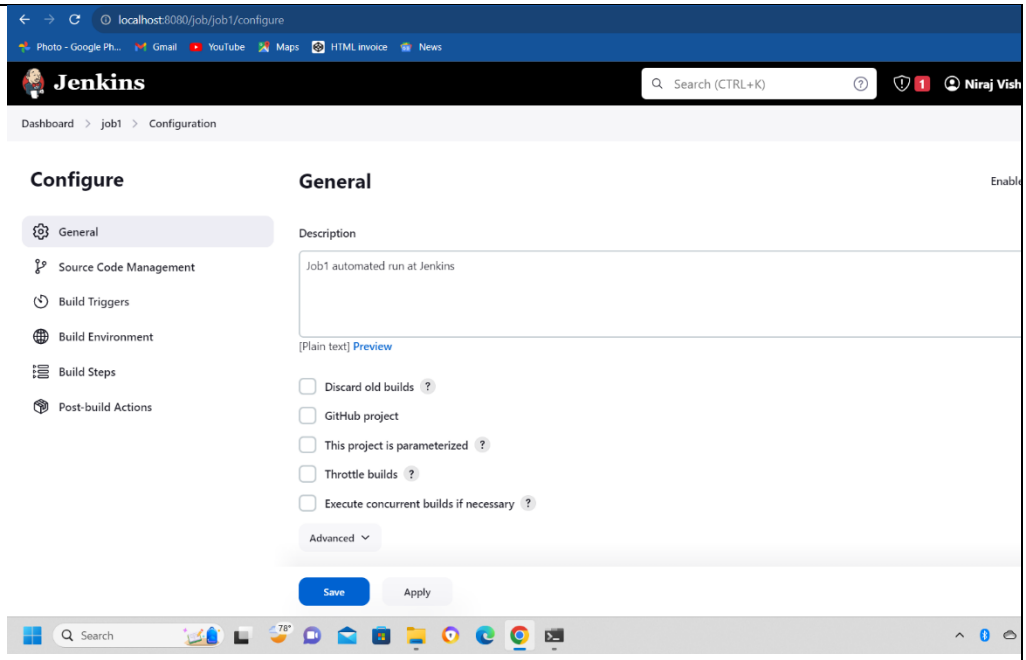
Full name

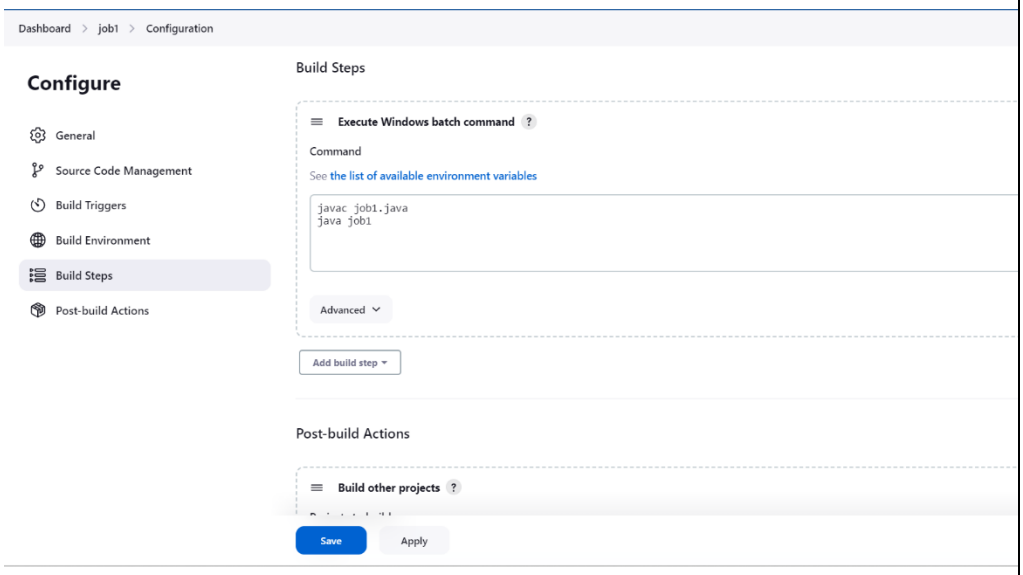
Niraj Vishwas Jadhav

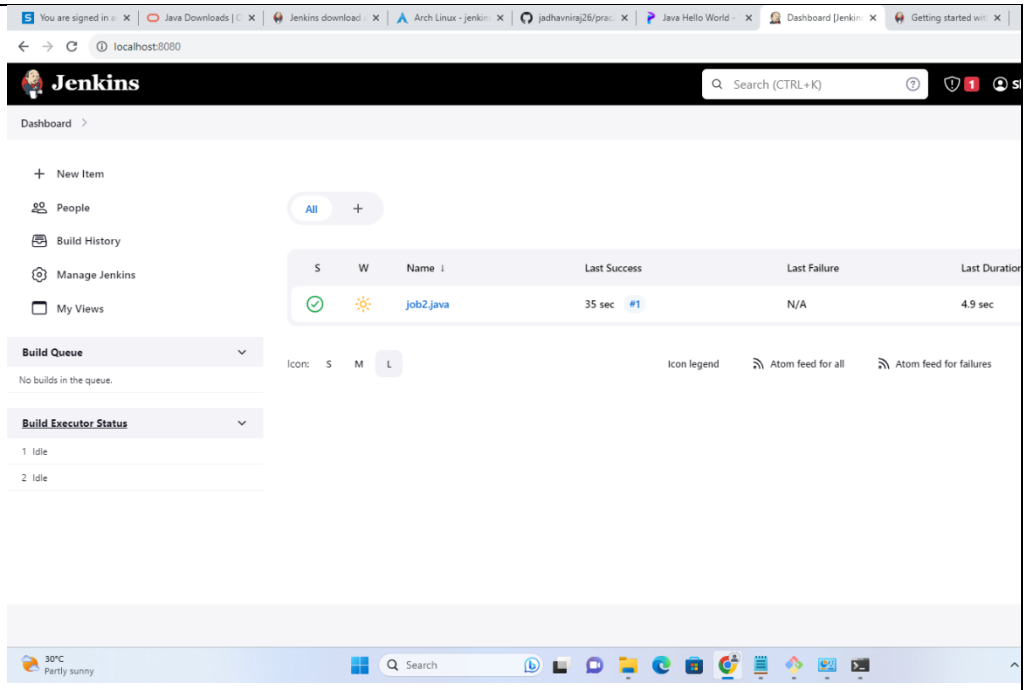
Jenkins 2.401.3

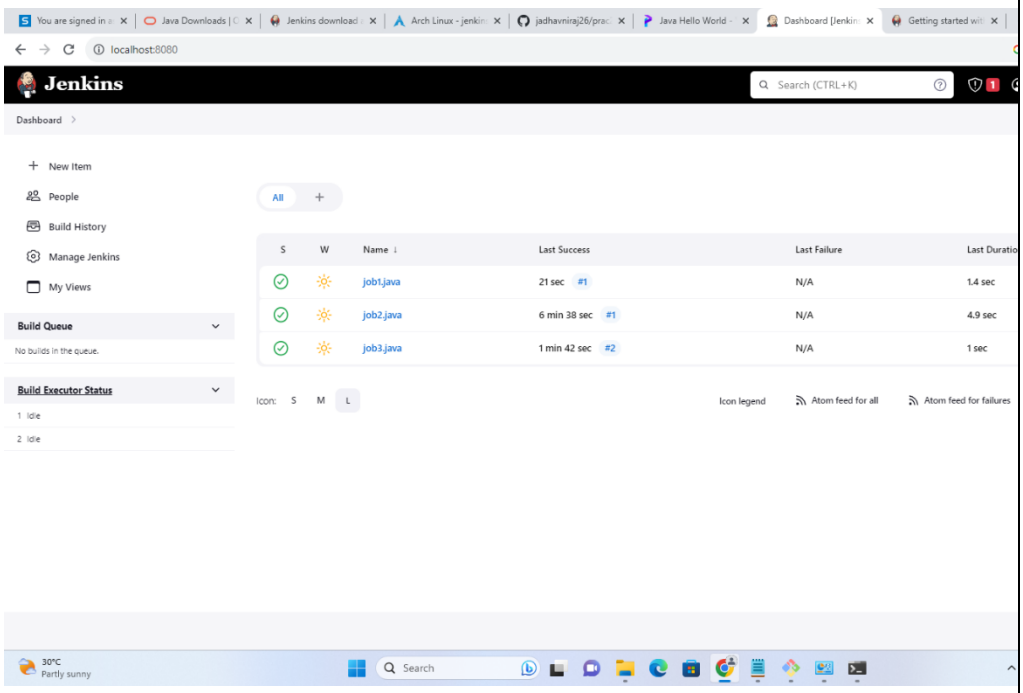
Skip and continue as admin

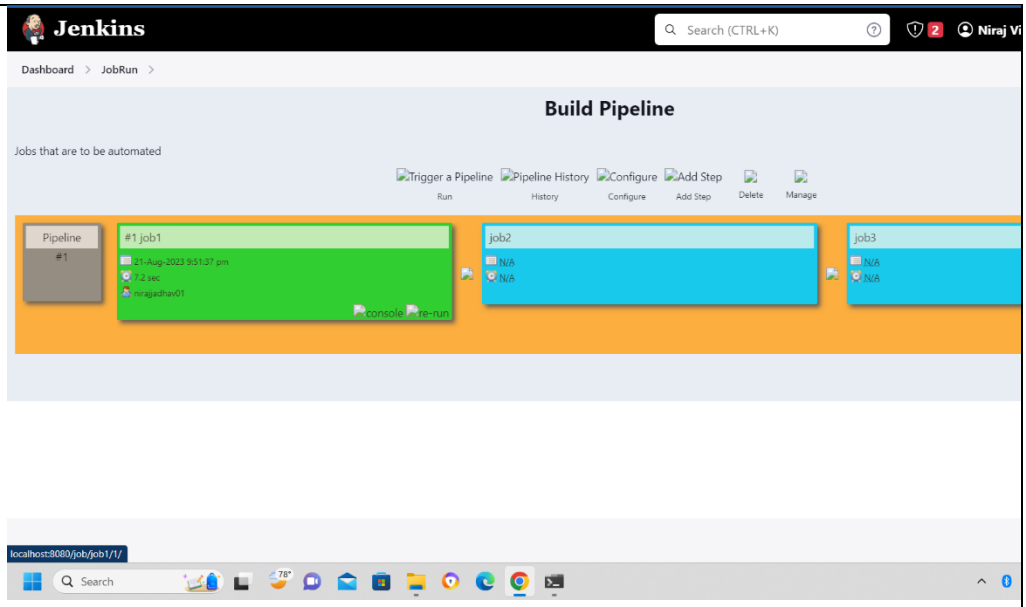



localhost:8080/job/job1/configure
Jenkins
Search (CTRL+K)
Dashboard > job1 > Configuration
Configure
General
Source Code Management
Build Triggers
Build Environment
Build Steps
Post-build Actions
General
Description
Job1 automated run at Jenkins
[Plain text] Preview
Discard old builds
GitHub project
This project is parameterized
Throttle builds
Execute concurrent builds if necessary
Advanced
Save
Apply


Dashboard > job1 > Configuration
Configure
General
Source Code Management
Build Triggers
Build Environment
Build Steps
Post-build Actions
Build Steps
Execute Windows batch command
Command
See the list of available environment variables
javac job1.java
java job1
Advanced
Add build step
Post-build Actions
Build other projects
Save
Apply


localhost:8080
Jenkins
Search (CTRL+K)
Dashboard
New Item
People
Build History
Manage Jenkins
My Views
Build Queue
No builds in the queue.
Build Executor Status
1 Idle
2 Idle
All
S
W
Name
Last Success
Last Failure
job2.java
35 sec #1
N/A
4.9 sec
Icon: S M L
Icon legend
Atom feed for all
Atom feed for failures
30°C
Partly sunny
Search


localhost:8080
Jenkins
Search (CTRL+K)
Dashboard
New Item
People
Build History
Manage Jenkins
My Views
Build Queue
No builds in the queue.
Build Executor Status
1 Idle
2 Idle
All
S
W
Name
Last Success
Last Failure
job1.java
21 sec #1
N/A
1.4 sec
job2.java
6 min 38 sec #1
N/A
4.9 sec
job3.java
1 min 42 sec #2
N/A
1 sec
Icon: S M L
Icon legend
Atom feed for all
Atom feed for failures
30°C
Partly sunny
Search

	
Conclusion	In this experiment , we have installed Jenkins and automated deployment process of programs using Jenkins.