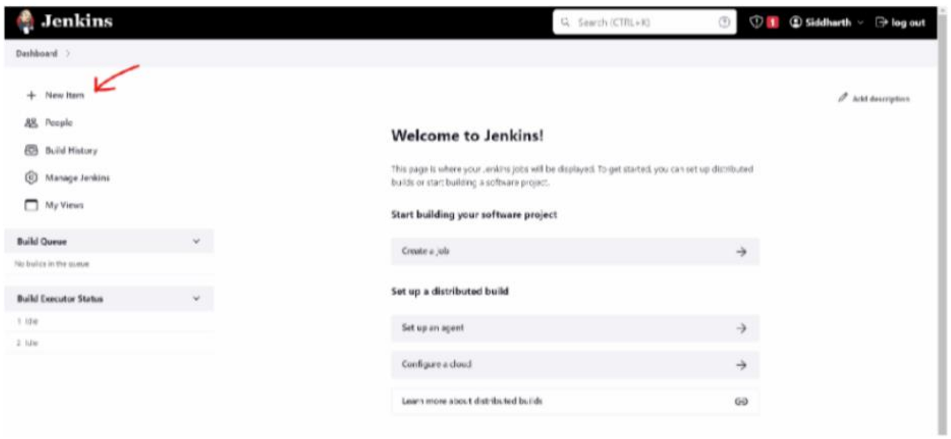
Experiment 5:

AIM: Demonstrate continuous integration and development using Jenkins.

DESCRIPTION:

Continuous Integration (CI) and Continuous Development (CD) are practices in software development that aim to automate and streamline the process of building, testing, and deploying software.

Step-1: Go to the dashboard, click on new item and give the item name.



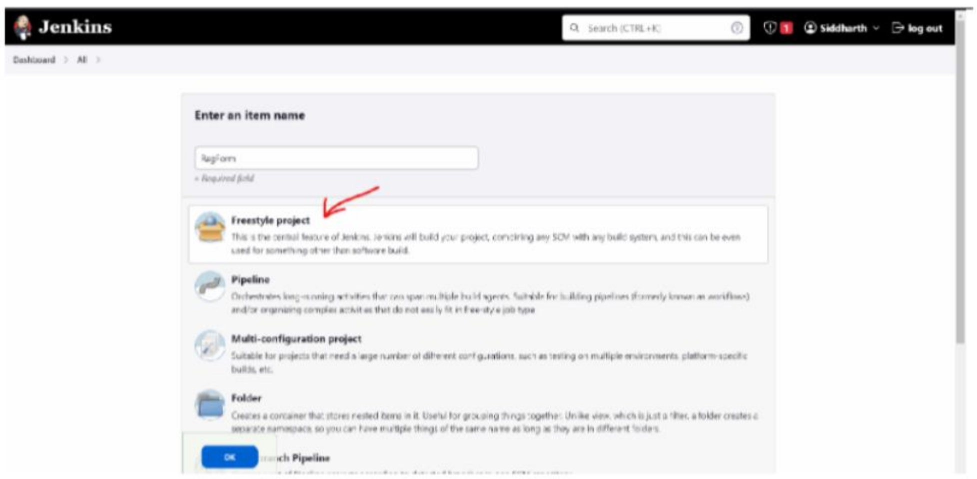
Welcome to Jenkins!

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

Set up a distributed build

Step-2: Select itemtype as Freestyle project & Click on OK.



Enter an item name

RegForm

» Required field

Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

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.

ch Pipeline

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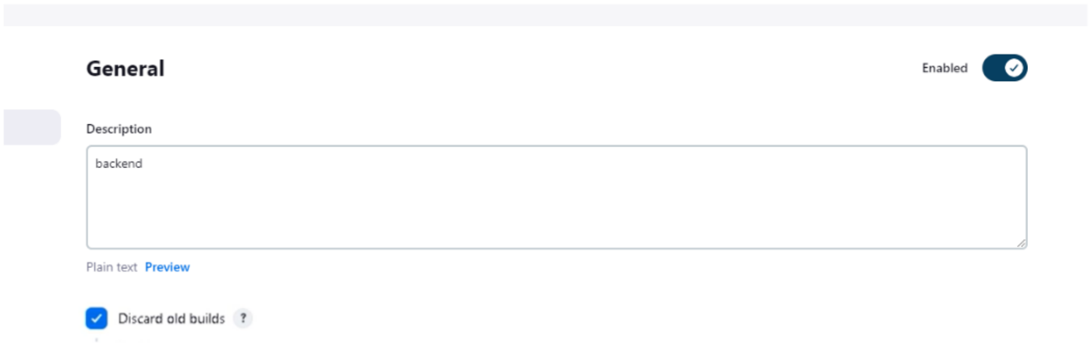
Step-3: configure

↳ go to general description

↳radio button

- select discard Old builds



General

Enabled

Description

backend

Plain text Preview

Discard old builds ✓

Step-4: Strategy

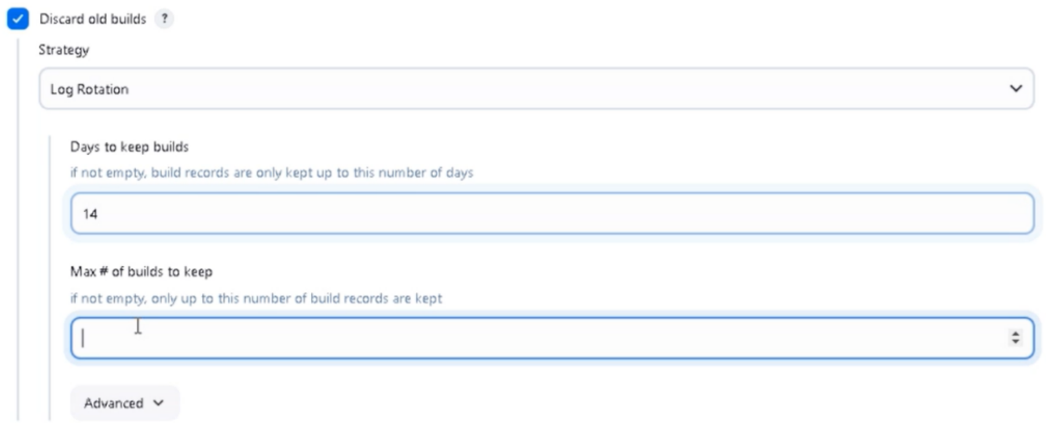
- Select it as log rotation

days to keep builds

- (any number) 14.

Maximum no. of builds to keep.

- (mm) (20)



Discard old builds ✓

Strategy

Log Rotation

Days to keep builds

if not empty, build records are only kept up to this number of days

14

Max # of builds to keep

if not empty, only up to this number of build records are kept

Step-5: Source code management:

- Click on Git radiobutton.

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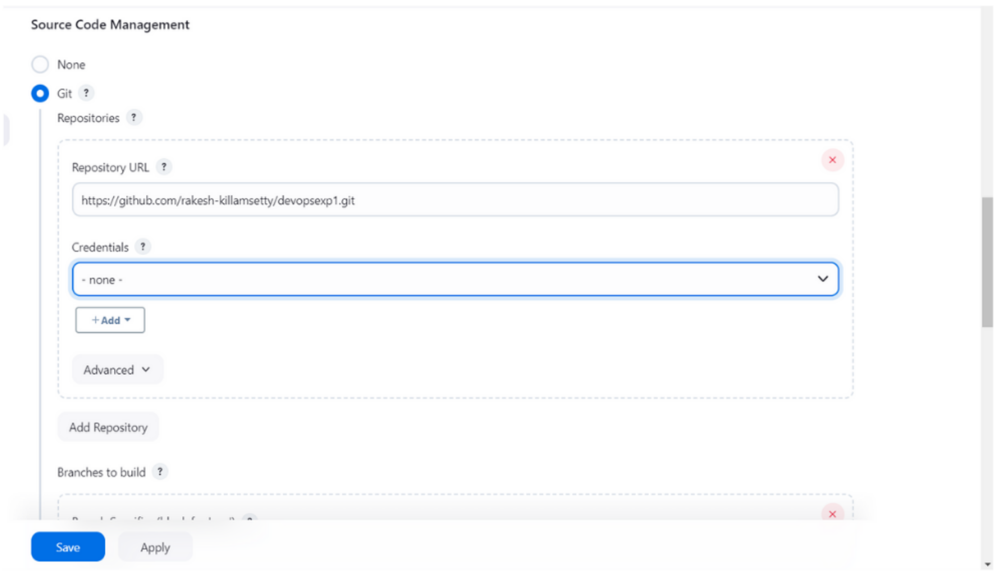
- Select GitHub project (Go to Github repository and copy the link).
- Go to project url
- (Give the GitHub url in the textbox).


Source Code Management

None

[✓ Git]

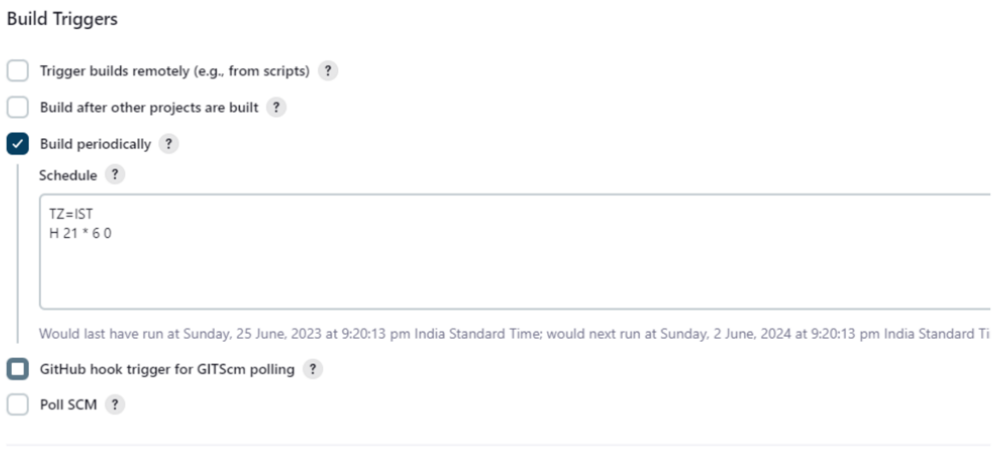
Repositories

Repository URL: https://github.com/rakesh-killamsetty/devopsexp1.git

Credentials: - none -

Step-6: go to Build triggers

- Select build periodically
- Type the following in textbox
  - TZ=IST
  - H21*60


Build Triggers

Trigger builds remotely (e.g., from scripts)

Build after other projects are built

[✓ Build periodically]

Schedule

```
TZ=IST
H 21 * 6 0
```

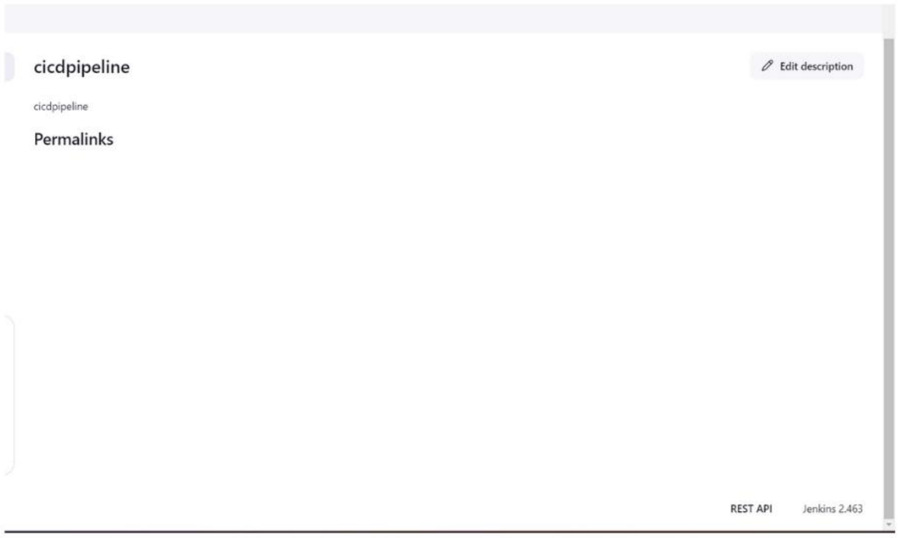
Would last have run at Sunday, 25 June, 2023 at 9:20:13 pm India Standard Time; would next run at Sunday, 2 June, 2024 at 9:20:13 pm India Standard Ti

GitHub hook trigger for GITScm polling

Poll SCM

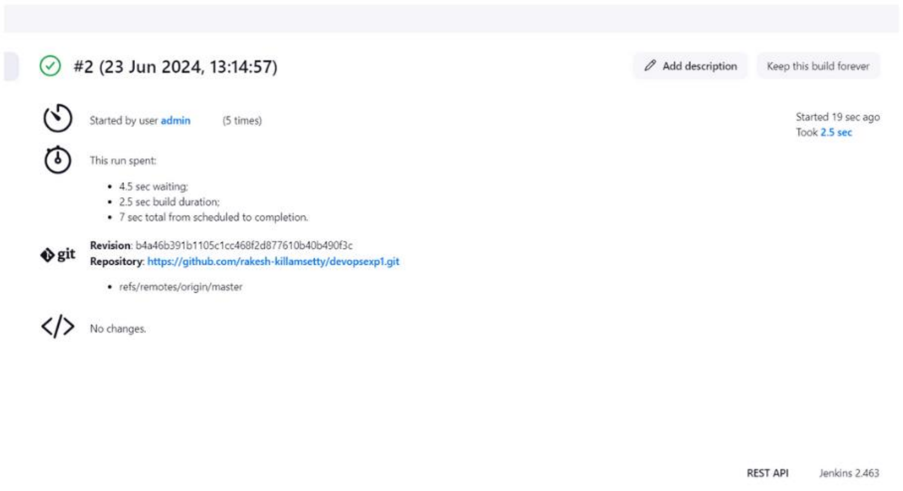
Step-7:

- Click on Save.
- Click on Build now
- In build witory you can see your first bina name as #1
- click on the console output, you can see the build Status as Success


cicdpipeline

cicdpipeline

Permalinks


#2 (23 Jun 2024, 13:14:57)

Started by user admin (5 times)

Started 19 sec ago
Took 2.5 sec

This run spent:

- 4.5 sec waiting;
- 2.5 sec build duration;
- 7 sec total from scheduled to completion.

Revision: b4a46b391b1105c1cc468f2d877610b40b490f3c
Repository: https://github.com/rakesh-killamsetty/devopsexp1.git

- refs/remotes/origin/master

No changes.

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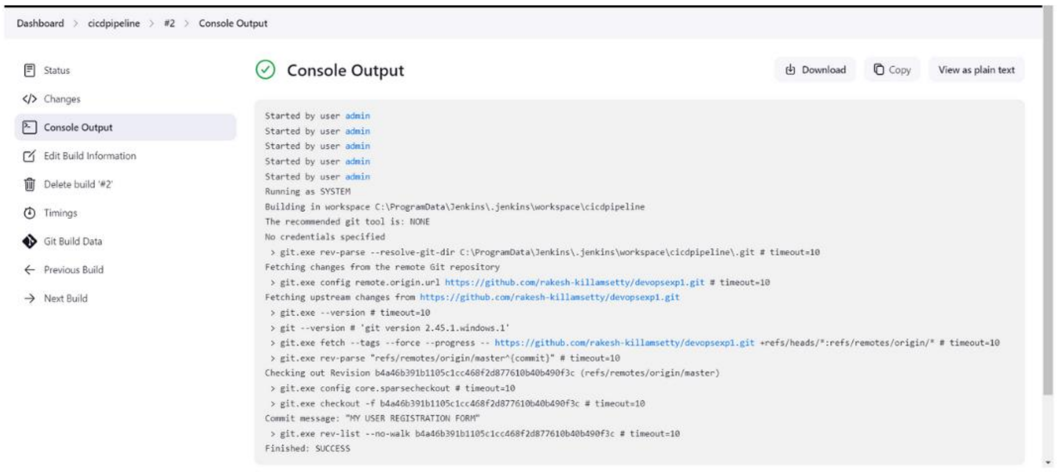
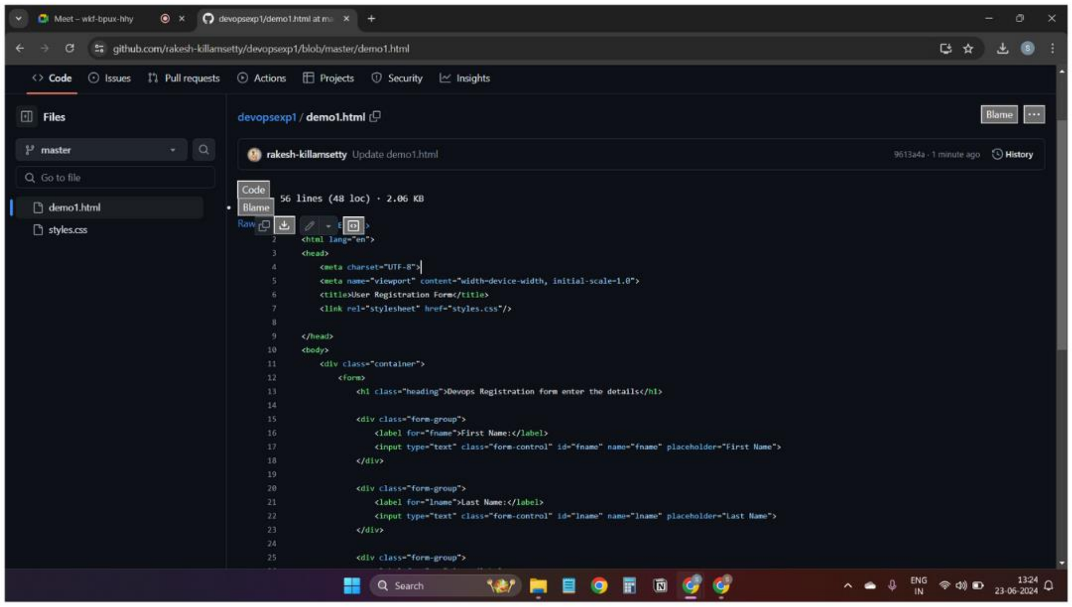
OUTPUT:



```
Started by user admin
Started by user admin
Started by user admin
Started by user admin
Started by user admin
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\.jenkins\workspace\cicdpipeline
The recommended git tool is: NONE
No credentials specified
 > git.exe rev-parse --resolve-git-dir C:\ProgramData\Jenkins\.jenkins\workspace\cicdpipeline\.git # timeout=10
Fetching changes from the remote Git repository
 > git.exe config remote.origin.url https://github.com/rakesh-killamsetty/devopsexp1.git # timeout=10
Fetching upstream changes from https://github.com/rakesh-killamsetty/devopsexp1.git
 > git.exe --version # timeout=10
 > git --version # 'git version 2.45.1.windows.1'
 > git.exe fetch --tags --force --progress -- https://github.com/rakesh-killamsetty/devopsexp1.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git.exe rev-parse "refs/remotes/origin/master^{commit}" # timeout=10
Checking out Revision b4a46b391b1105c1cc468f2d877610b40b490f3c (refs/remotes/origin/master)
 > git.exe config core.sparsecheckout # timeout=10
 > git.exe checkout -f b4a46b391b1105c1cc468f2d877610b40b490f3c # timeout=10
Commit message: "MY USER REGISTRATION FORM"
 > git.exe rev-list --no-walk b4a46b391b1105c1cc468f2d877610b40b490f3c # timeout=10
Finished: SUCCESS
```

After the project get save in your repository, any changes in the GitHub will be build automatically



```
56 lines (48 loc) · 2.06 KB
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>User Registration Form</title>
    <link rel="stylesheet" href="styles.css"/>

</head>
<body>
    <div class="container">
        <form>
            <h1 class="heading">Devops Registration form enter the details</h1>

            <div class="form-group">
                <label for="fname">First Name:</label>
                <input type="text" class="form-control" id="fname" name="fname" placeholder="First Name">
            </div>

            <div class="form-group">
                <label for="lname">Last Name:</label>
                <input type="text" class="form-control" id="lname" name="lname" placeholder="Last Name">
            </div>

            <div class="form-group">
```

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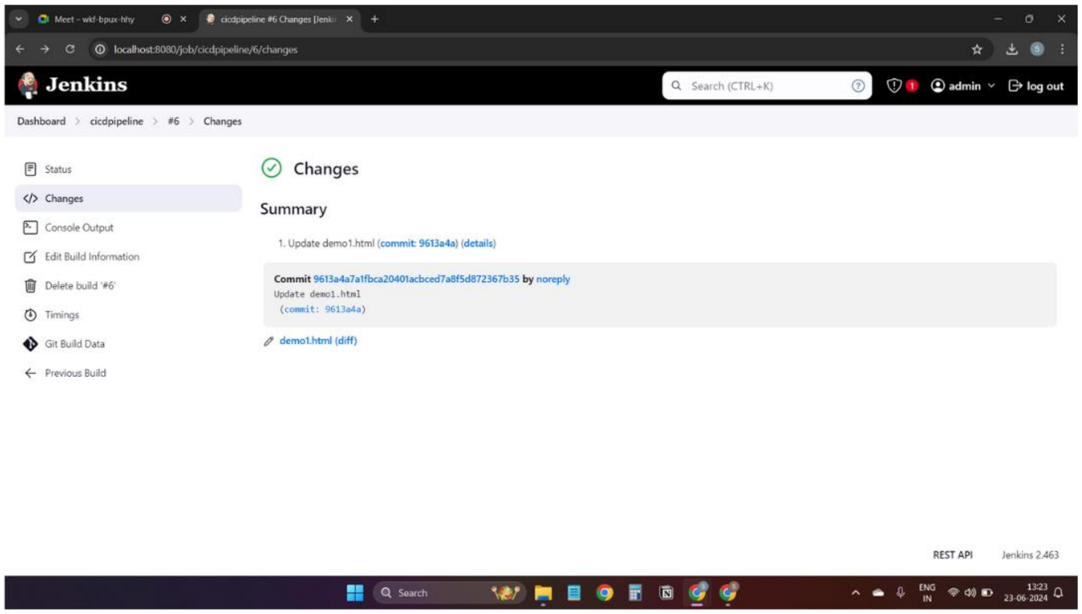


localhost:8080/job/cicdpipeline/6/changes

Dashboard > cicdpipeline > #6 > Changes

Changes

Summary

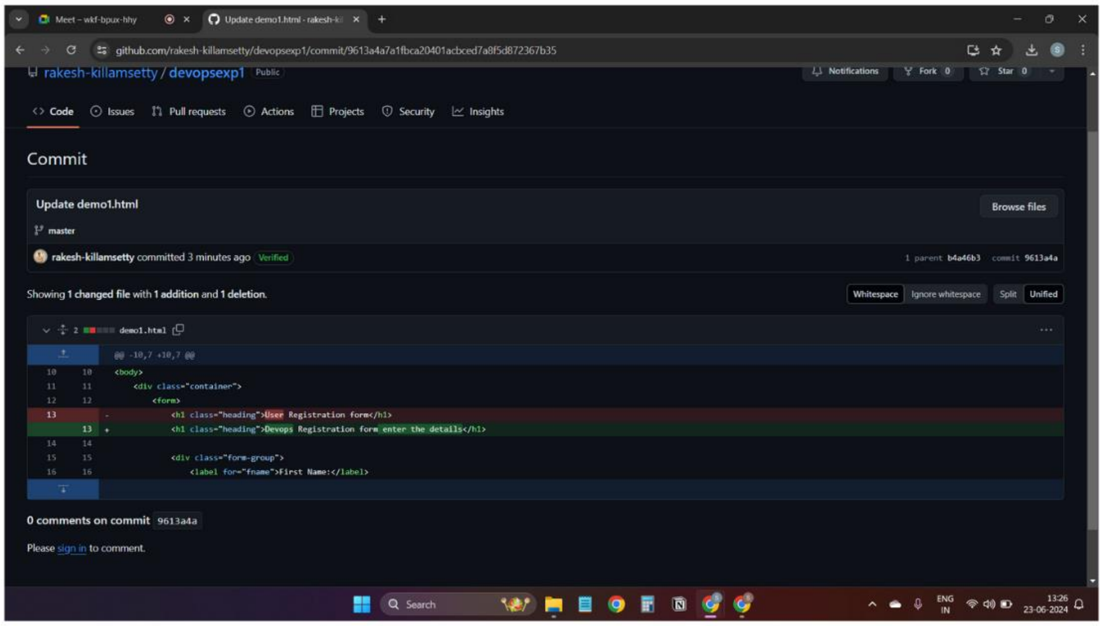
1. Update demo1.html (commit: 9613a4a) (details)

Commit 9613a4a7a1fbca20401acbced7a8f5d872367b35 by noreply

```
Update demo1.html
 (commit: 9613a4a)
```

demo1.html (diff)

REST API Jenkins 2.463



github.com/rakesh-killamsetty/devopsexp1/commit/9613a4a7a1fbca20401acbced7a8f5d872367b35

rakesh-killamsetty / devopsexp1 Public

Commit

Update demo1.html

master

rakesh-killamsetty committed 3 minutes ago Verified 1 parent b4a46b3 commit 9613a4a

Showing 1 changed file with 1 addition and 1 deletion.

```
demo1.html
@@ -10,7 +10,7 @@
 <body>
     <div class="container">
         <form>
-            <h1 class="heading">User Registration form</h1>
+            <h1 class="heading">Devops Registration form enter the details</h1>

             <div class="form-group">
                 <label for="fname">First Name:</label>
```

0 comments on commit 9613a4a

Please sign in to comment.

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EXPERIMENT 6

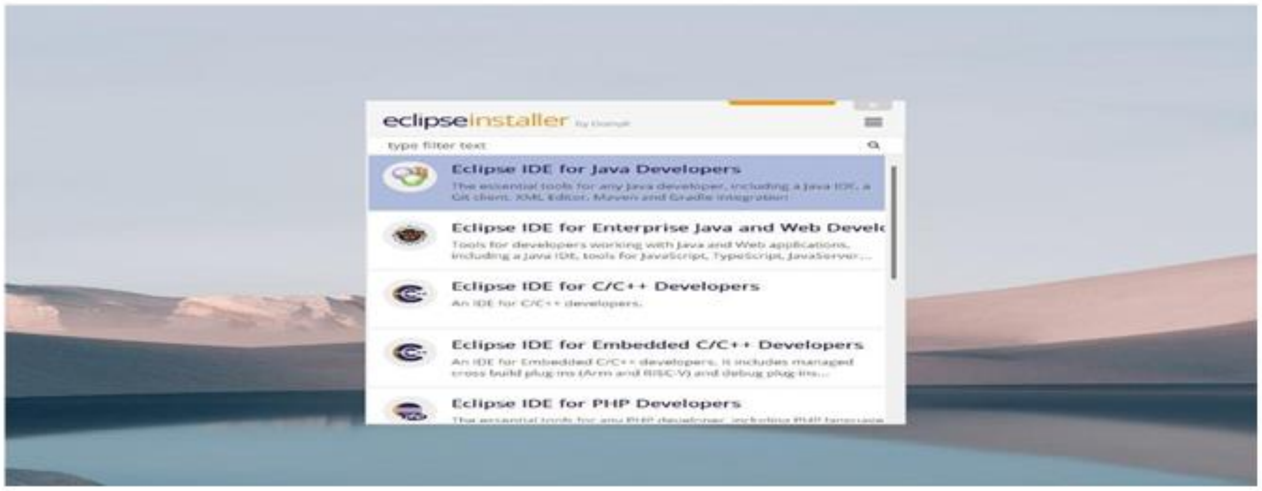
AIM :

PROGRAM :

>> Install java17/ java 21.

>> after installing JAVA jdk. Now, Search for Eclispe IDE in browser. Click on first link.

>>Install ECLISPE IDE for java developers→click on Install → click on launch.



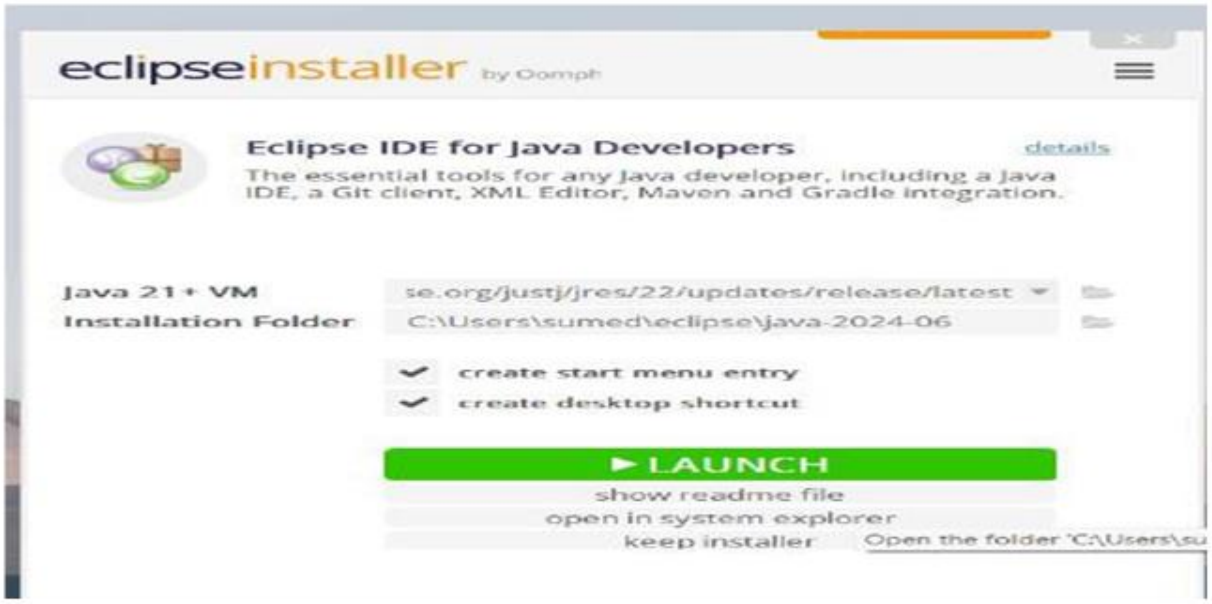
Eclipse IDE for Java Developers
The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Maven and Gradle integration

Eclipse IDE for Enterprise Java and Web Develc
Tools for developers working with Java and Web applications, including a Java IDE, tools for JavaScript, TypeScript, JavaServer...

Eclipse IDE for C/C++ Developers
An IDE for C/C++ developers.

Eclipse IDE for Embedded C/C++ Developers
An IDE for Embedded C/C++ developers. It includes managed cross build plug-ins (Arm and RISC-V) and debug plug-ins...

Eclipse IDE for PHP Developers



Eclipse IDE for Java Developers
The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Maven and Gradle integration.

Java 21+ VM: se.org/justj/jres/22/updates/release/latest
Installation Folder: C:\Users\sumed\eclipse\java-2024-06

✓ create start menu entry
✓ create desktop shortcut

Open the folder 'C:\Users\su

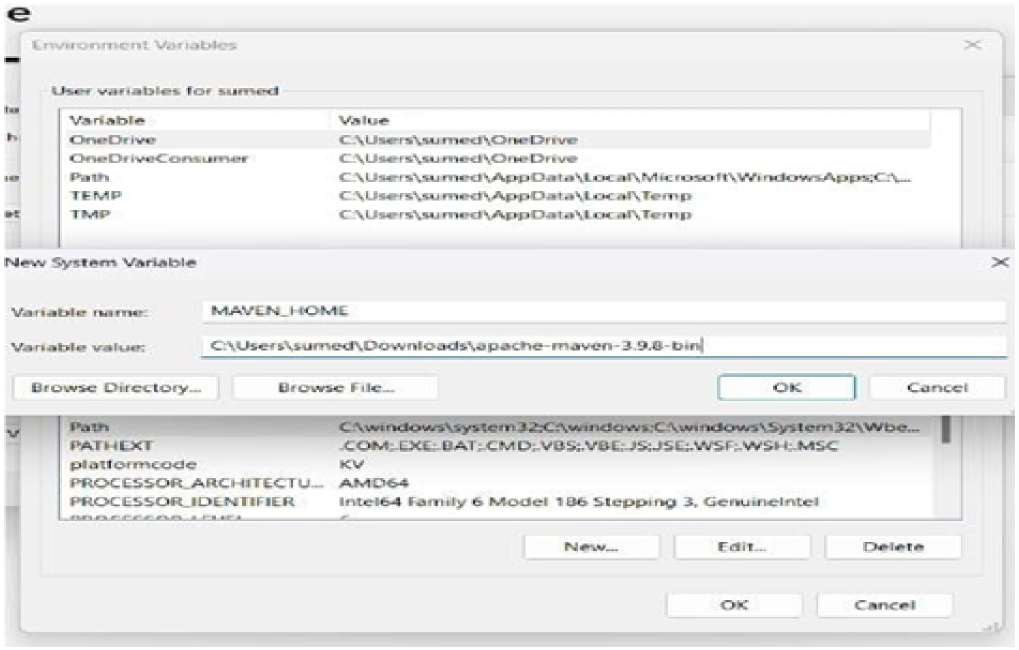
>> Now, browse Maven and download it .

>> after Installing → open file explorer →click on maven zip file and extract the files.

>> Now, open settings→ search for edit system environment variables.

>> click on new and add a variable.

- Variable name : MAVEN_HOME
- Variable value: maven path (from file explorer)



Variable	Value
OneDrive	C:\Users\sumed\OneDrive
OneDriveConsumer	C:\Users\sumed\OneDrive
Path	C:\Users\sumed\AppData\Local\Microsoft\WindowsApps;C:\...
TEMP	C:\Users\sumed\AppData\Local\Temp
TMP	C:\Users\sumed\AppData\Local\Temp

Variable name: MAVEN_HOME

Variable value: C:\Users\sumed\Downloads\apache-maven-3.9.8-bin

Path	C:\windows\system32;C:\windows;C:\windows\System32\Wbe...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
platformcode	KV
PROCESSOR_ARCHITECTU...	AMD64
PROCESSOR_IDENTIFIER	Intel64 Family 6 Model 186 Stepping 3, GenuineIntel

>> click on ok.

>> In same environment variable → open path variable →click edit

>> in new window click on new, enter : %MAVEN_HOME%\bin

>> click on ok.

>> open eclipse and click on file→new→maven project

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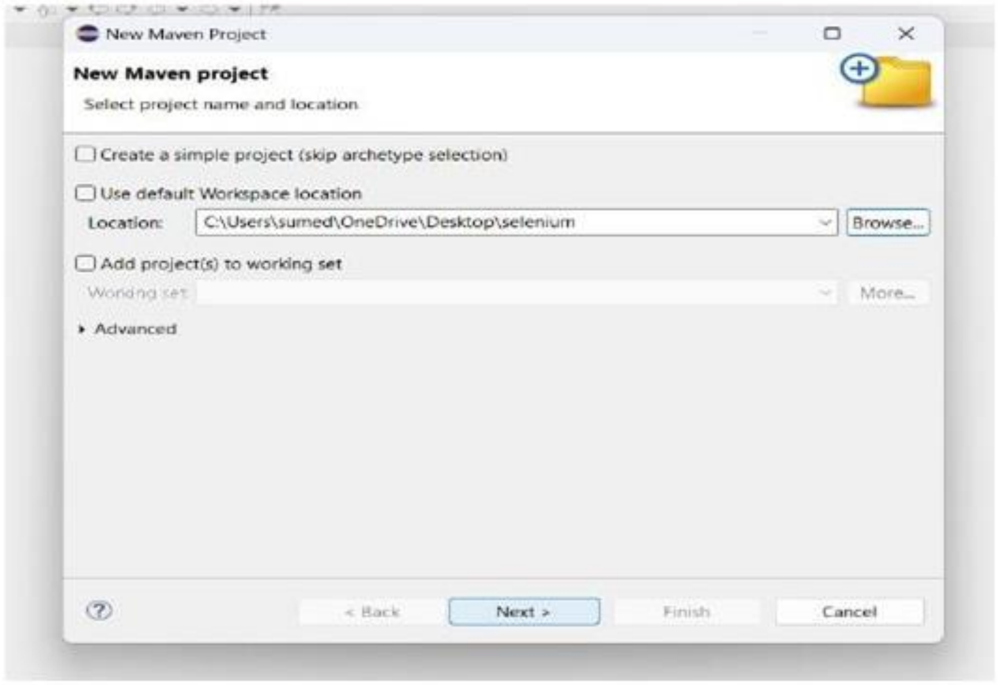

New Maven Project

New Maven project

Select project name and location

☐ Create a simple project (skip archetype selection)

☐ Use default Workspace location

Location: C:\Users\sumed\OneDrive\Desktop\selenium

☐ Add project(s) to working set

Working set:

>> create a folder in desktop.

>>Select it for this file to create a project where remove the check box for default workspace location and paste the new folder location and click on next.

>> FITER: select ALL CATALOG

- Select maven- archtype-quickstart. click next.

>> enter Artifact id : devops (perferable name)

>>click finish

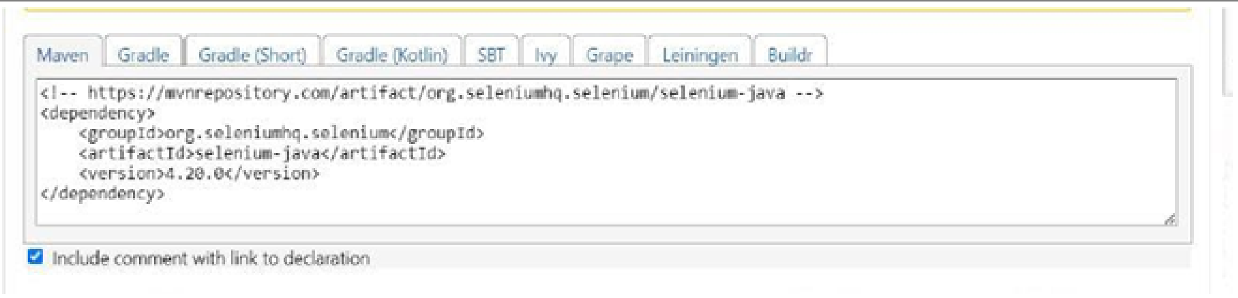
>> enter "Y" in terminal

>> Select Devops src/main/java □com.maven.devops□app.java

>> Select pom.xml add dependencies (near dependencies tags)

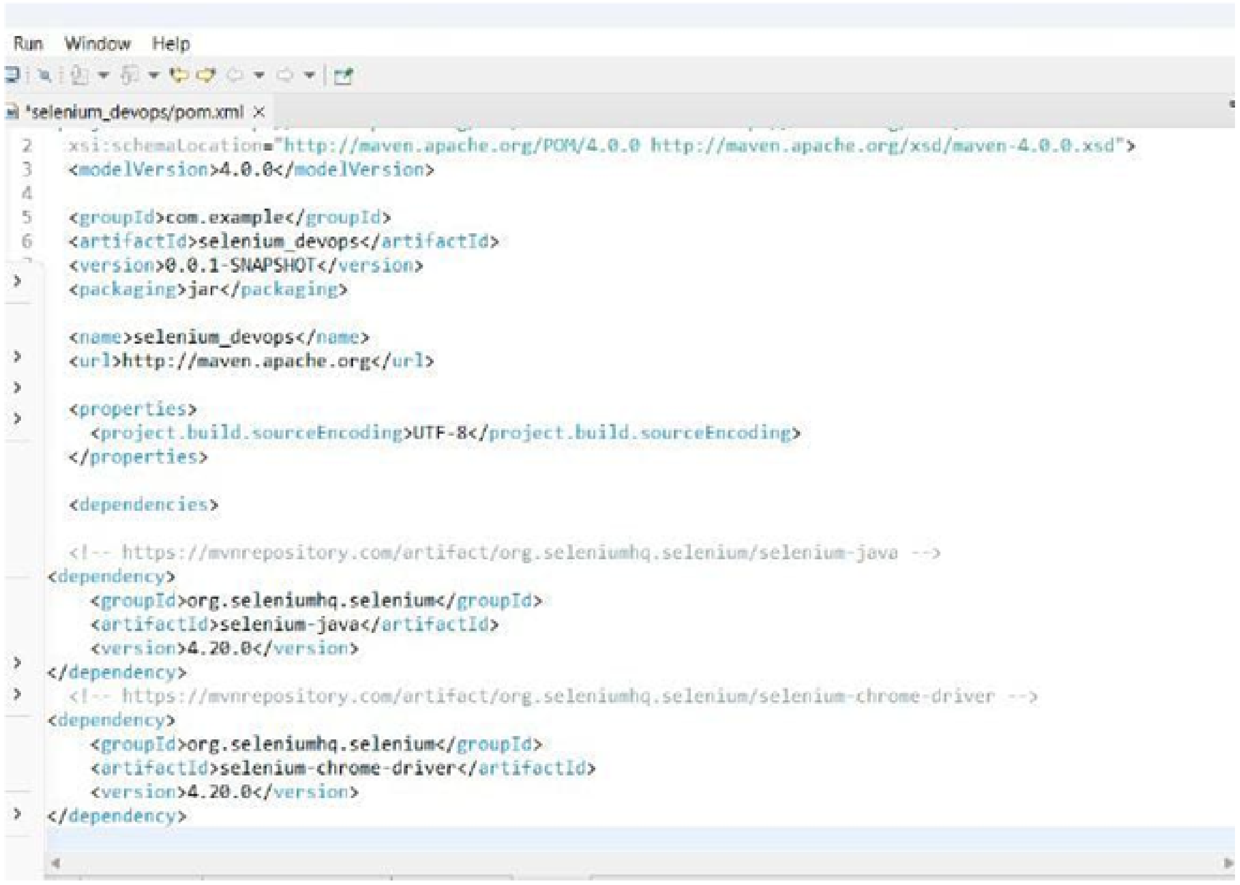
1. Selenium java:

- Search for java maven dependency in google browser
- Select the java maven code
- Click on lastest version(4.21.0)



```
<!-- https://mvnrepository.com/artifact/org.seleniumhq.selenium/selenium-java -->
<dependency>
    <groupId>org.seleniumhq.selenium</groupId>
    <artifactId>selenium-java</artifactId>
    <version>4.20.0</version>
</dependency>
```

- Copy the dependency codde and paste in pom.xml file
1. Similarly add selenium chrome driver dependency into pom.xml.file



```
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.example</groupId>
  <artifactId>selenium_devops</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <packaging>jar</packaging>

  <name>selenium_devops</name>
  <url>http://maven.apache.org</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  </properties>

  <dependencies>

  <!-- https://mvnrepository.com/artifact/org.seleniumhq.selenium/selenium-java -->
<dependency>
    <groupId>org.seleniumhq.selenium</groupId>
    <artifactId>selenium-java</artifactId>
    <version>4.20.0</version>
</dependency>
  <!-- https://mvnrepository.com/artifact/org.seleniumhq.selenium/selenium-chrome-driver -->
<dependency>
    <groupId>org.seleniumhq.selenium</groupId>
    <artifactId>selenium-chrome-driver</artifactId>
    <version>4.20.0</version>
</dependency>
```

>> run the app.java program(using java application this option is provided after right click on "run as")

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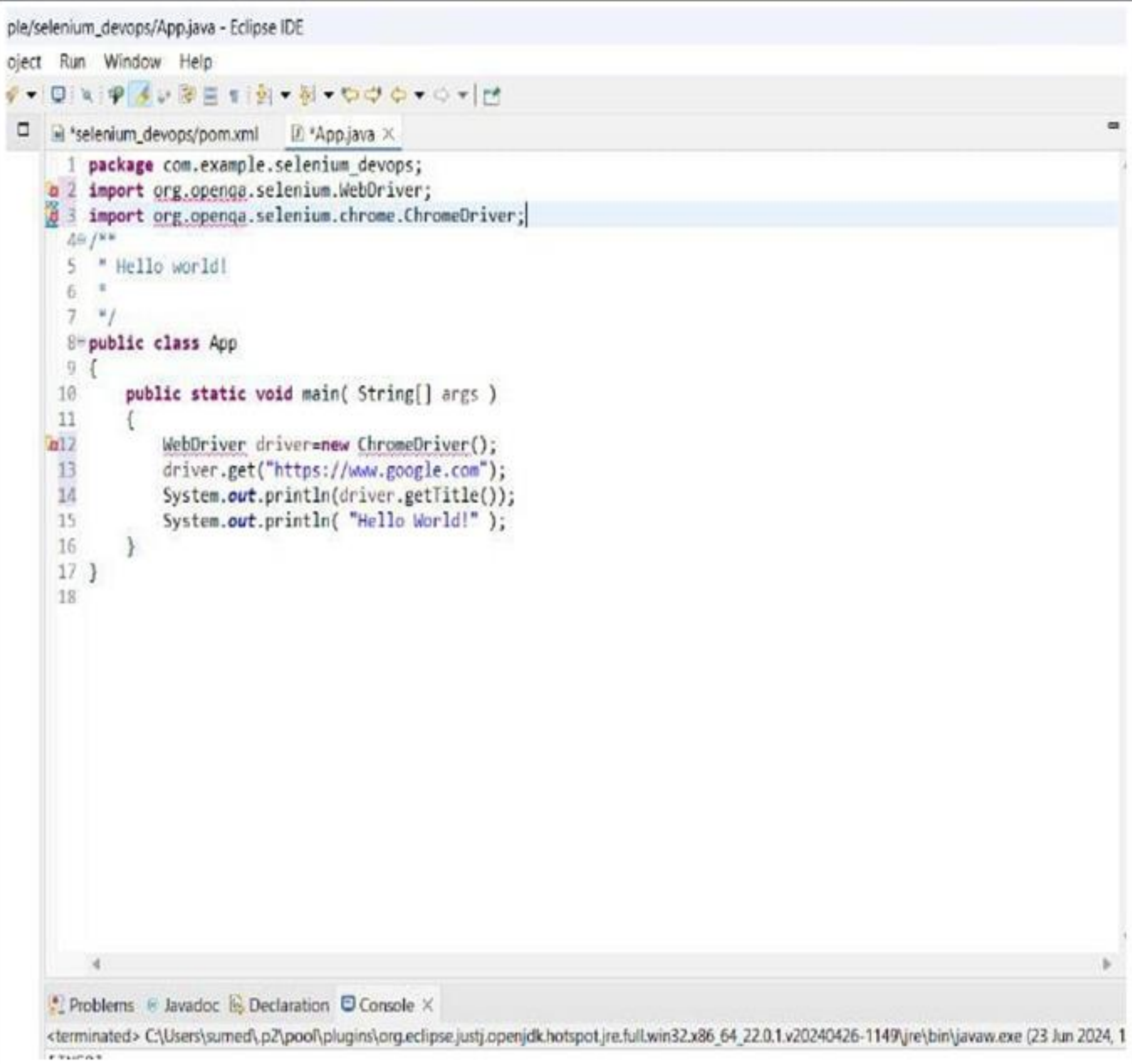

ple/selenium_devops/App.java - Eclipse IDE

oject Run Window Help

*selenium_devops/pom.xml *App.java

```
package com.example.selenium_devops;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.chrome.ChromeDriver;
/**
 * Hello world!
 *
 */
public class App
{
    public static void main( String[] args )
    {
        WebDriver driver=new ChromeDriver();
        driver.get("https://www.google.com");
        System.out.println(driver.getTitle());
        System.out.println( "Hello World!" );
    }
}
```

Problems Javadoc Declaration Console

```
<terminated> C:\Users\sumed\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_22.0.1.v20240426-1149\jre\bin\javaw.exe (23 Jun 2024, 1
```

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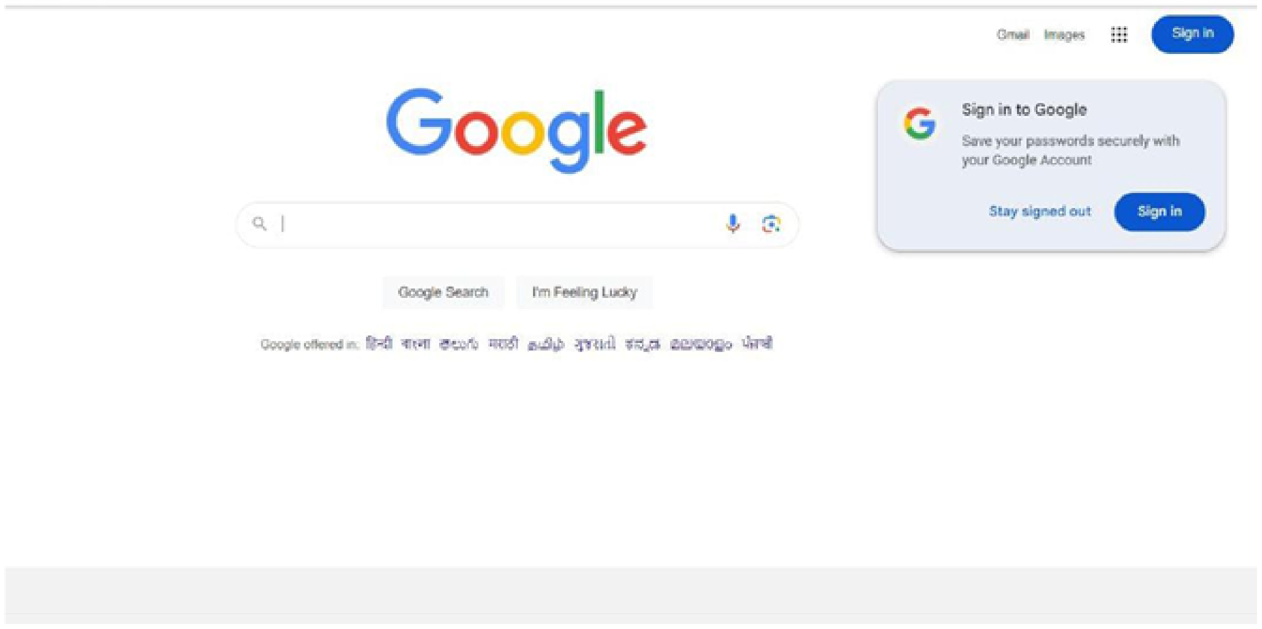
OUTPUT:


Gmail
Images
Sign in
Google
Google Search
I'm Feeling Lucky
Google offered in: हिन्दी বাংলা తెలుగు मराठी தமிழ் ગુજરાતી ಕನ್ನಡ മലയാളം ਪੰਜਾਬੀ
Sign in to Google
Save your passwords securely with your Google Account
Stay signed out
Sign in

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Experiment 7:

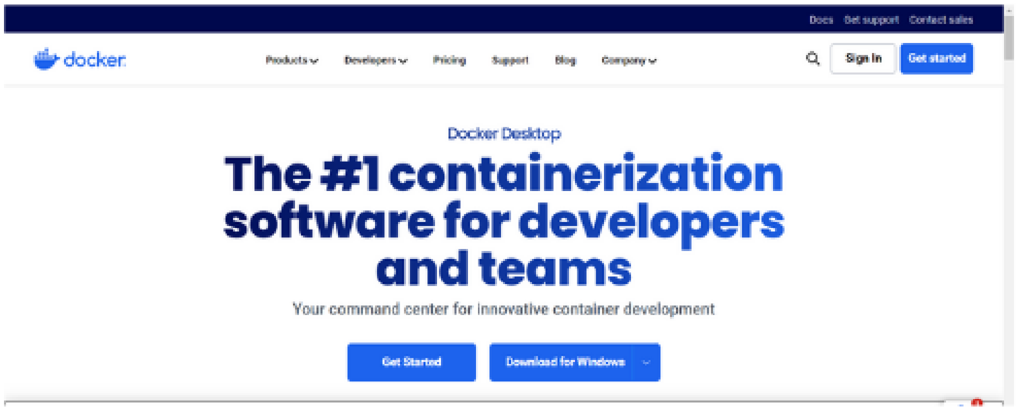
AIM: Develop a simple containerized application using Docker.

DESCRIPTION:

Docker is a set of platform as a service (PaaS) products that use OS-level virtualization to deliver software in packages called containers. It is a tool that is used to automate the deployment of applications in lightweight containers so that applications can work efficiently in different environments in isolation

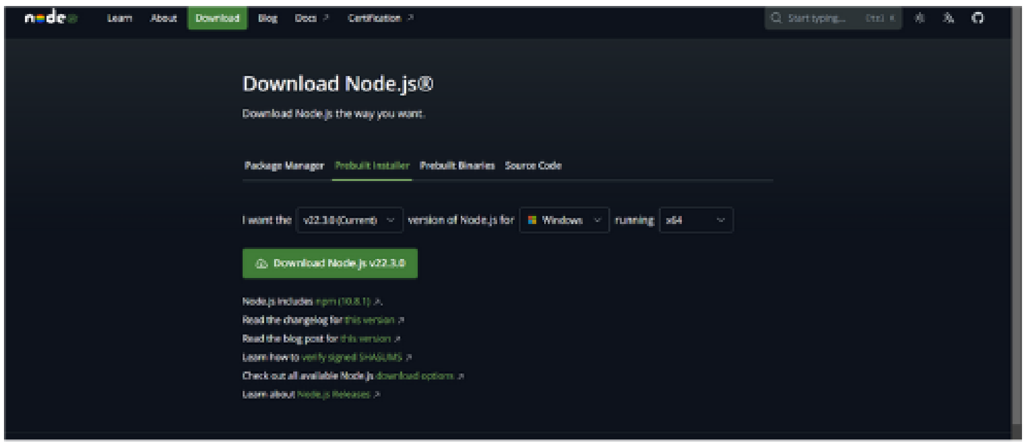
Step-1: Install Docker Desktop (Make sure you got wsl updated in your device (Win 11 / Win 10))

Install node.js (Make sure you install it with admin privileges). Check if node is installed using 'npm –version' cmd.



The #1 containerization software for developers and teams

Your command center for innovative container development



Download Node.js®

Download Node.js the way you want.

I want the v22.3.0(Current) version of Node.js for Windows running x64

Node.js includes npm (10.8.1)

Read the changelog for this version

Read the blog post for this version

Learn how to verify signed SHASUMS

Check out all available Node.js download options

Learn about Node.js Releases

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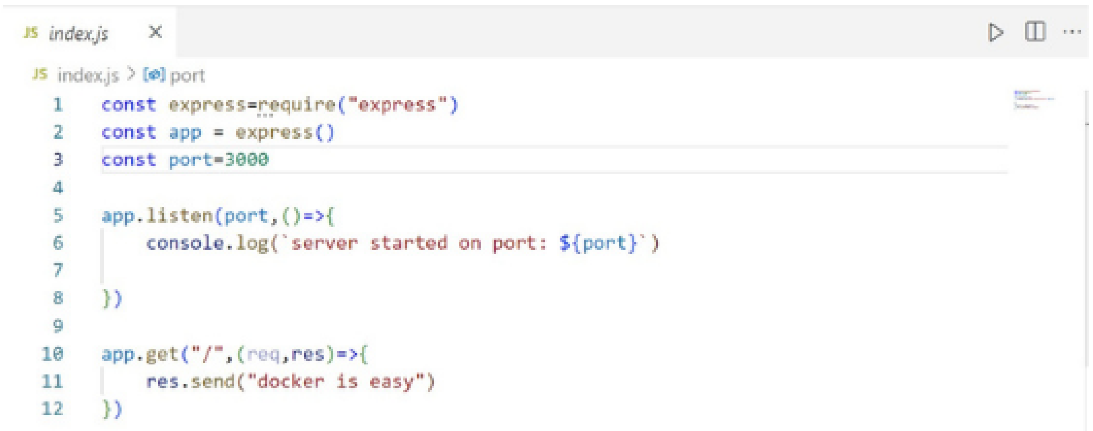
Step-2: Building a node.js server application:

- Create a simple server application using node.js.
- From a new directory, create a file called index.js. Run ‘npm init’ cmd. Check if the package.json and package-lock.json are added into the directory.
- Run ‘npm i express’ to install express dependency for building server.
- Write configuration code in the index.js file for a simple server. Expose a port (3000) and an endpoint (“/”).
- Run the server application by running ‘node index.js’



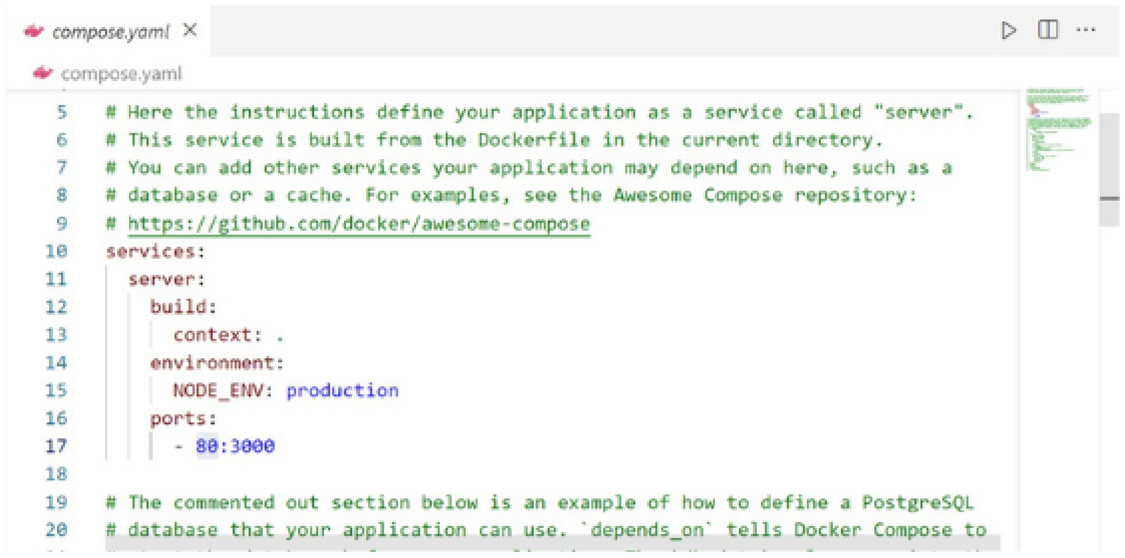
```
const express=require("express")
const app = express()
const port=3000

app.listen(port,()=>{
    console.log(`server started on port: ${port}`)

})

app.get("/",(req,res)=>{
    res.send("docker is easy")
})
```

- Check if the server is running on the exposed port from the browser by running the command ‘node index.js’.
- Then, to containersie/dockerise application:
  - Open docker desktop to start running the docker engine
  - Go to the working directory of the server application, and run ‘docker init’ and specify the configuration settings
  - Check if the files are added to your directory such as DockerFile, compose.yaml, dockerIgnore.
  - Go to compose.yaml file, and configure the port mapping as per your needs (localPort: containerPort)



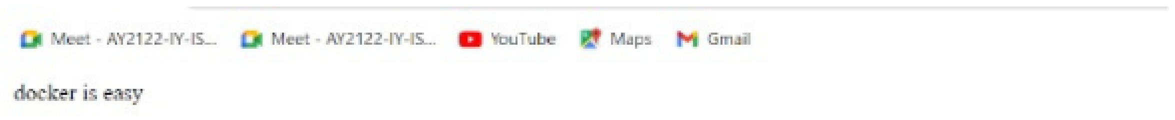
compose.yaml

```yaml
# Here the instructions define your application as a service called "server".
# This service is built from the Dockerfile in the current directory.
# You can add other services your application may depend on here, such as a
# database or a cache. For examples, see the Awesome Compose repository:
# https://github.com/docker/awesome-compose
services:
  server:
    build:
      context: .
    environment:
      NODE_ENV: production
    ports:
      - 80:3000

# The commented out section below is an example of how to define a PostgreSQL
# database that your application can use. `depends_on` tells Docker Compose to
```

Step-3: Running the docker container:

- Run the 'docker compose --up build' command. Check if the container is running in the Docker Desktop application.
- Now visit the port you have exposed as per the config in compose.yaml. Check if the application is being run in your device from docker container.



docker is easy

To stop the application, run "Ctrl+C"

You have successfully containerised a server application using docker.

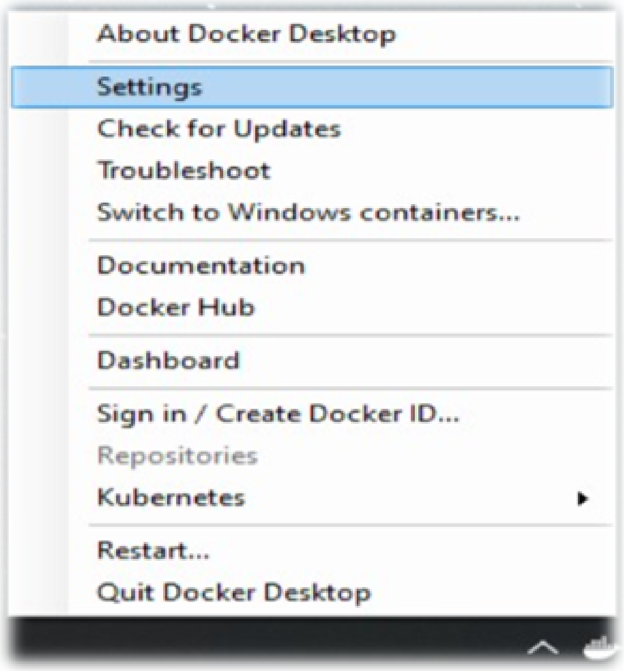
EXPERIMENT 8:

AIM : Integrate Kubernetes and Docker.

PROGRAM :

Install Docker desktop, enable Kubernetes. Kubernetes itself runs in containers. When you deploy a Kubernetes cluster you first install Docker (or another container runtime like containerd) and then use tools like **kubeadm** which starts all the Kubernetes components in containers. Docker Desktop does all that for you.

Make sure you have Docker Desktop running - in the taskbar in Windows and the menu bar on the Mac you'll see Docker's whale logo. Click the whale and select Settings:



Click on Kubernetes and check the Enable Kubernetes checkbox:

Roll No. ______________________________ MGIT

Laboratory Record of

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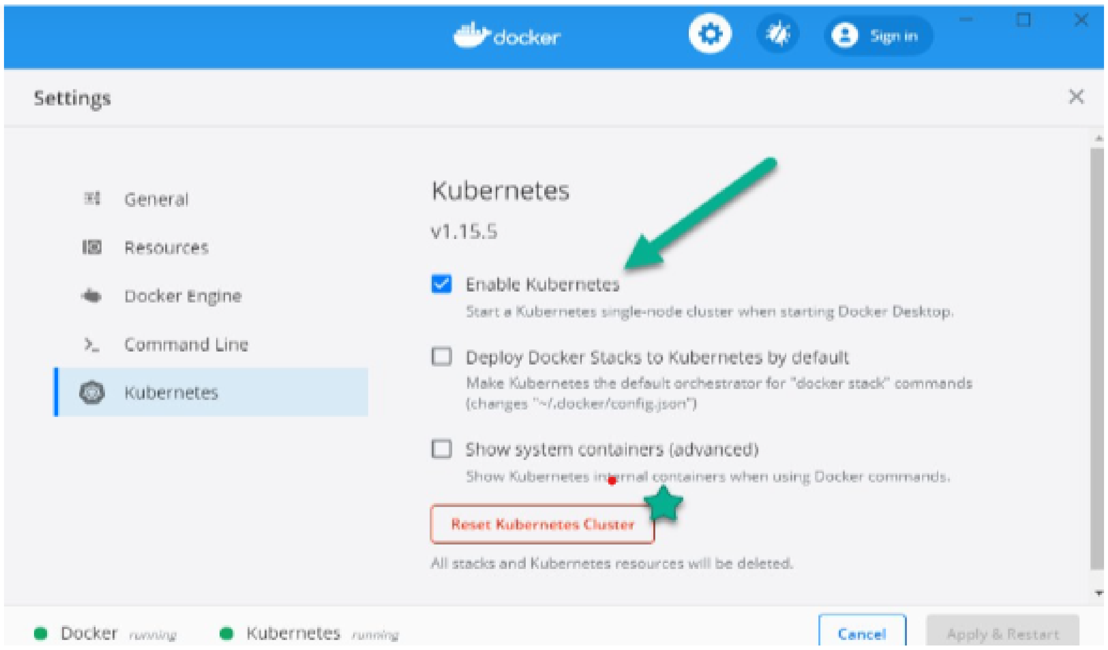
Sheet No. _________

Experiment No._____

Date_____________



Kubernetes

v1.15.5

[✓] Enable Kubernetes
Start a Kubernetes single-node cluster when starting Docker Desktop.

[ ] Deploy Docker Stacks to Kubernetes by default
Make Kubernetes the default orchestrator for "docker stack" commands (changes "~/.docker/config.json")

[ ] Show system containers (advanced)
Show Kubernetes internal containers when using Docker commands.

Reset Kubernetes Cluster

All stacks and Kubernetes resources will be deleted.

● Docker running ● Kubernetes running

Verify your Kubernetes cluster: like Docker uses ‘docker’ and ‘docker-compose’ commands tomanage containers, Kubernetes uses tool ‘kubect1’ to manage apps. Docker desktop installs kubect1 too.

Check the state of Docker desktop cluster:

kubectl get nodes