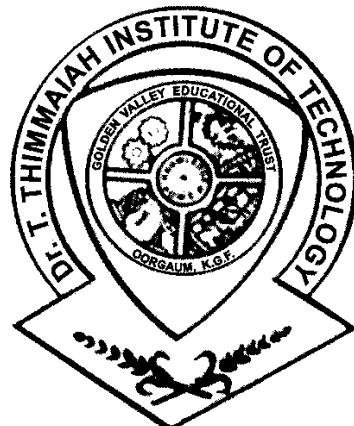


Dr.T.THIMMIAH INSTITUTE OF TECHNOLOGY
(Formerly Golden Valley Institute of Technology)
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VI Semester DevOps Lab
Subject code: BCSL657D

Name of the Student:.....

USN of the Student:.....

SI.NO	EXPERIMENTS
1	Introduction to Maven and Gradle: Overview of Build Automation Tools, Key Differences Between Maven and Gradle, Installation and Setup
2	Working with Maven: Creating a Maven Project, Understanding the POM File, Dependency Management and Plugins
3	Working with Gradle: Setting Up a Gradle Project, Understanding Build Scripts (Groovy and Kotlin DSL), Dependency Management and Task Automation
4	Practical Exercise: Build and Run a Java Application with Maven, Migrate the Same Application to Gradle.
5	Introduction to Jenkins: What is Jenkins?, Installing Jenkins on Local or Cloud Environment, Configuring Jenkins for First Use
6	Continuous Integration with Jenkins: Setting Up a CI Pipeline, Integrating Jenkins with Maven/Gradle, Running Automated Builds and Tests
7	Configuration Management with Ansible: Basics of Ansible: Inventory, Playbooks, and Modules, Automating Server Configurations with Playbooks, Hands-On: Writing and Running a Basic Playbook
8	Practical Exercise: Set Up a Jenkins CI Pipeline for a Maven Project, Use Ansible to Deploy Artifacts Generated by Jenkins
9	Introduction to Azure DevOps: Overview of Azure DevOps Services, Setting Up an Azure DevOps Account and Project
10	Creating Build Pipelines: Building a Maven/Gradle Project with Azure Pipelines, Integrating Code Repositories (e.g., GitHub, Azure Repos), Running Unit Tests and Generating Reports
11	Creating Release Pipelines: Deploying Applications to Azure App Services, Managing Secrets and Configuration with Azure Key Vault, Hands-On: Continuous Deployment with Azure Pipelines
12	Practical Exercise and Wrap-Up: Build and Deploy a Complete DevOps Pipeline, Discussion on Best Practices and Q&A

PROGRAM-1

Introduction to Maven and Gradle: Overview of Build Automation Tools, Key Differences Between Maven and Gradle, Installation and Setup

STEP1:Install Eclipse using this link

<https://www.eclipse.org/downloads/>

ENTERPRISE JAVA AND WEB DEVELOPERS

The screenshot shows the Eclipse Installer website. At the top, there's a search bar with 'type filter text' and a 'SPONSOR' button. Below it, there are four main sections:

- Eclipse IDE for Java Developers**: Includes a icon of a person working on a laptop, a brief description, and a 'details' link.
- Eclipse IDE for Enterprise Java and Web Developers**: Includes a icon of a gear with 'Java EE IDE' text, a brief description, and a 'details' link.
- Eclipse IDE for C/C++ Developers**: Includes a icon of a gear with 'C/C++' text, a brief description, and a 'details' link.
- Eclipse IDE for Embedded C/C++ Developers**: Includes a icon of a gear with 'Embedded C/C++' text, a brief description, and a 'details' link.

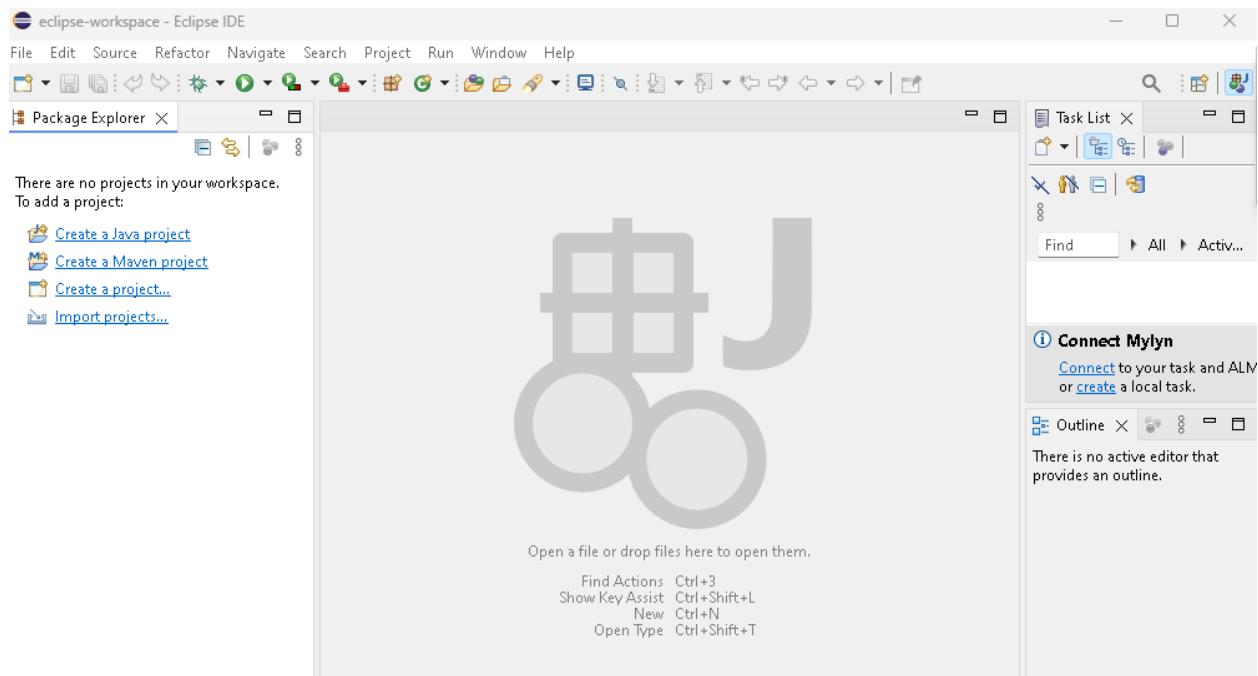
STEP2:Select ECLIPSE IDE FOR JAVA DEVELOPER OR ECLIPSE IDE FOR

STEP3:SELECT INSTALLATION FOLDER JAVA VERSION

The screenshot shows the 'Eclipse IDE for Java Developers' installation wizard. It has the following fields:

- Java 21+ VM**: Set to 'JRE 23.0.1 - https://download.eclipse.org/justj/jres/23/updates/release/latest'.
- Installation Folder**: Set to 'C:\Users\abhijith.k_cmrit\eclipse\java-2024-12'.
- checkboxes**: Two checkboxes are checked:
 - create start menu entry
 - create desktop shortcut
- INSTALL**: A large orange button at the bottom.
- BACK**: A link in the bottom left corner.

STEP4:ONCE ECLIPSE IS INSTALLED THE SCREEN LOOKS AS IN BELOW



STEP5:Lets see Procedure to install MAVEN & SPARCLE

- a) First make sure JDK current version is installed

<https://www.oracle.com/java/technologies/downloads/?er=221886#jdk23-windows>

Then set environment variable path both user and system

- Have a JDK installation on your system. Either set the **JAVA_HOME** environment variable pointing to your JDK installation or have the java executable on your PATH.

- b) To install apache maven pls go to link as in below and download zip file of bin

<https://maven.apache.org/download.cgi>

The screenshot shows the Apache Maven download page. The top navigation bar includes links for Welcome, License, About Maven, Download, Use, Documentation, Plugins, Maven Extensions, Books and Resources, Security, and Community. The main content area is titled "Downloading Apache Maven 3.9.0". It states "Apache Maven 3.9.0 is the latest release. It is the recommended version for all users." Below this is a "System Requirements" section with tables for Java Development Kit (JDK), Memory, Disk, and Operating System. The "Files" section lists download options for Maven 3.9.0, including Binary tar.gz archive, Binary Zip archive, Source tar.gz archive, and Source zip archive. Each option includes a link to the file, a checksum column, and a signature column. At the bottom, there are links for "3.9.0 Release Notes and Release Reference Documentation", "Source code from source repository", "Download under the Apache License, version 2.0", and "Other".

Link	Checksums	Signature
Binary tar.gz archive	apache-maven-3.9.0-bin.tar.gz apache-maven-3.9.0-bin.tar.gz.sha12	apache-maven-3.9.0-bin.tar.gz.asc
Binary Zip archive	apache-maven-3.9.0-bin.zip apache-maven-3.9.0-bin.zip.sha12	apache-maven-3.9.0-bin.zip.asc
Source tar.gz archive	apache-maven-3.9.0-src.tar.gz apache-maven-3.9.0-src.tar.gz.sha12	apache-maven-3.9.0-src.tar.gz.asc
Source zip archive	apache-maven-3.9.0-src.zip apache-maven-3.9.0-src.zip.sha12	apache-maven-3.9.0-src.zip.asc

c) To unzip the Source zip archive

Run in Windows cmd prompt

unzip apache-maven-3.9.9-bin.zip

If don't want to run directly extract the file to Program Files

d) Setup a PATH in environmental settings

"Add the bin directory of the created directory apache-maven-3.9.9 to the
PATH environment variable"

e) After environment variable is set

Run this command in CMD prompt

mvn --v(2 hyphen)

After running, you see the text screen as in below

```
Apache Maven 3.9.9 (8e8579a9e76f7d015ee5ec7bfcdc97d260186937)
Maven home: /opt/apache-maven-3.9.9
Java version: 1.8.0_45, vendor: Oracle Corporation
Java home: /Library/Java/JavaVirtualMachines/jdk1.8.0_45.jdk/Contents/Home/jre
Default locale: en_US, platform encoding: UTF-8
OS name: "mac os x", version: "10.8.5", arch: "x86_64", family: "mac"
```

f) TO INSTALL GRADLE FOR WINDOWS follow procedure as in below

1. Create a new directory C:\Gradle with File Explorer.

2. Open a second File Explorer window and go to the directory where the Gradle distribution was downloaded. Double-click the ZIP archive to expose the content. **Drag the content folder gradle-8.12.1 to your newly created C:\Gradle folder.**

Alternatively you can unpack the Gradle distribution ZIP into C:\Gradle using an archiver tool of your choice or run command with path folder where the folder is created.

unzip apache-maven-3.9.9-bin.zip

Or can directly extract the zip file.

- 3. Configure your system environment**
- 4. Finally type the command `gradle -v` to check if the gradle is installed.**

```
Gradle 8.12.1
-----
Build time: 2025-01-24 12:55:12 UTC
Revision: 0blee1ff81d1f4a26574ff4a362ac9180852b140

Kotlin: 2.0.21
Groovy: 3.0.22
Ant: Apache Ant(TM) version 1.10.15 compiled on August 25 2024
Launcher JVM: 21.0.5 (Oracle Corporation 21.0.5+9-LTS-239)
Daemon JVM: C:\Program Files\Java\jdk-21 (no JDK specified, using current Java home)
OS: Windows 11 10.0 amd64
```

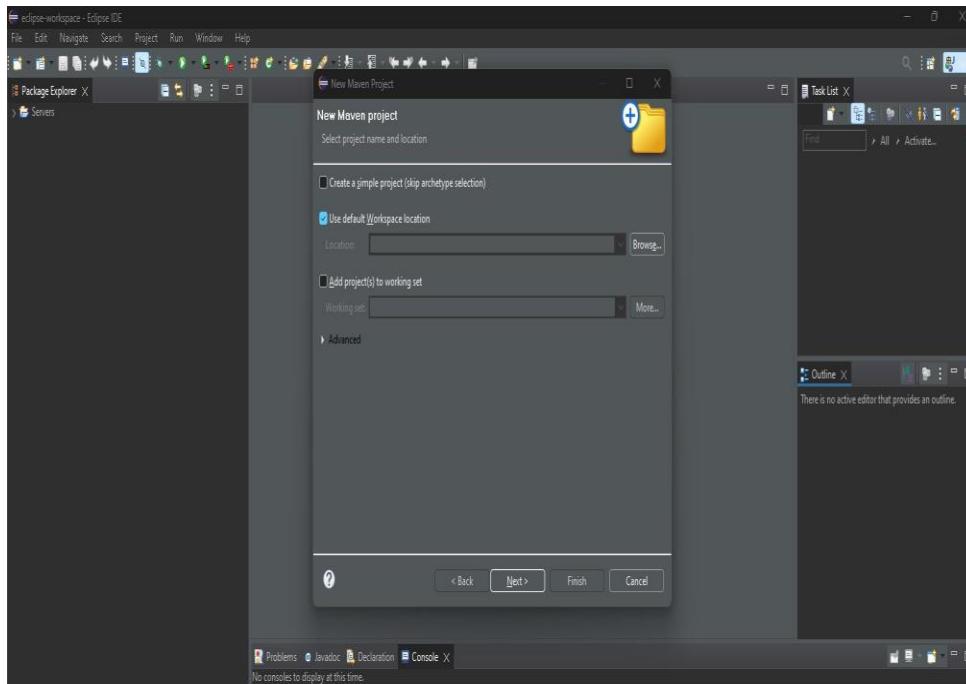
PROGRAM-2

Working with Maven: Creating a Maven Project, Understanding the POM File, Dependency Management and Plugins

STEP1:OPEN ECLIPSE THEN follow this navigation

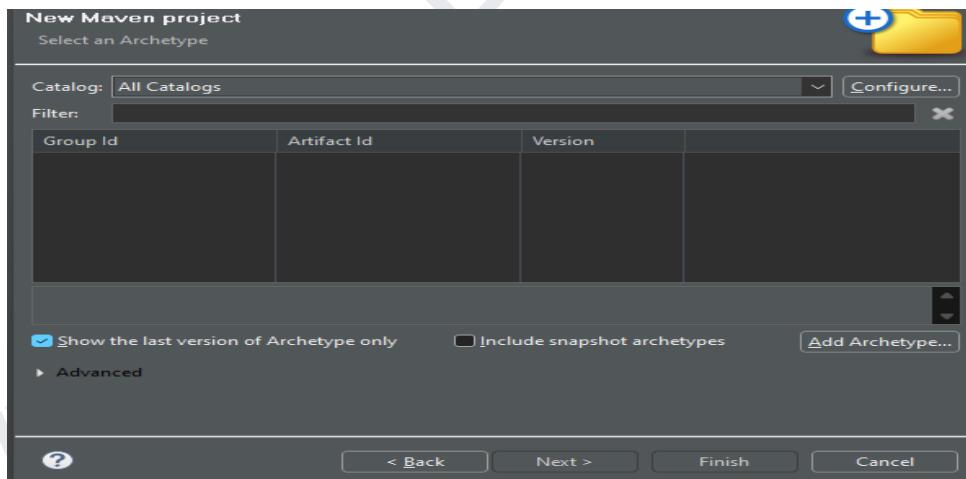
File -----> New----->Maven Project

After that Screen be as in below

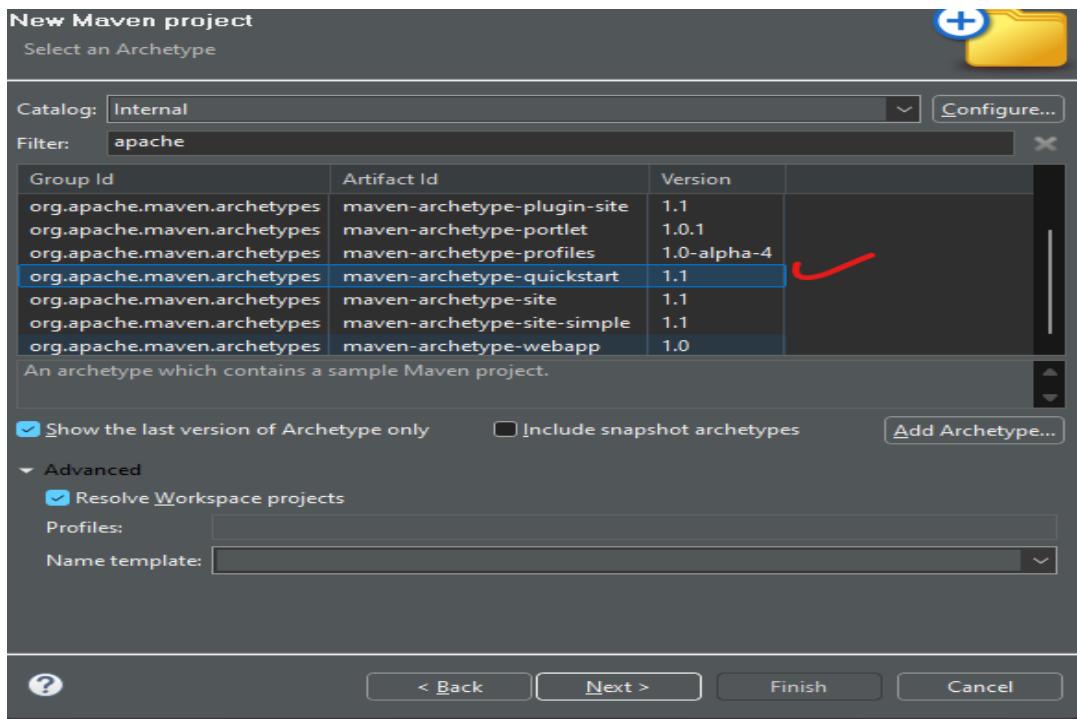


STEP2: Make sure Use default Workspace Location is selected, then click Next

The screen be as in below



**STEP3: In Screen shown above, click near the entry place of Filter and type "apache" or select catalog as Internal
We want a simple maven JAR based application. So, we will choose the "maven-archetype-quickstart" artifact to create the project.**

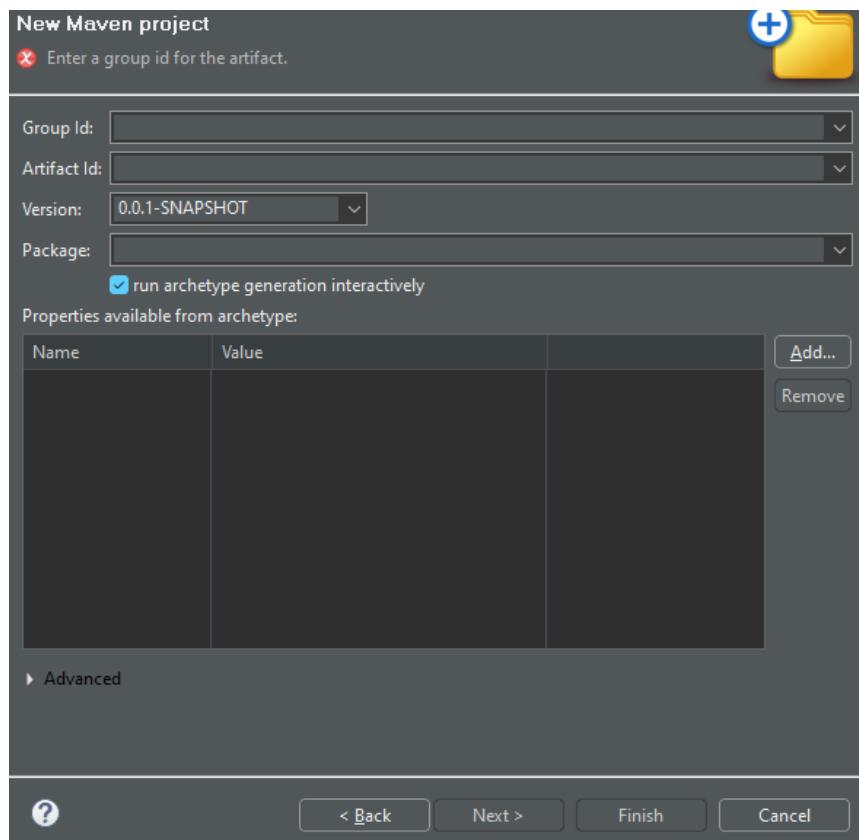


STEP4: Enter

Group Id:com.program2.maven

Artifact Id:program2-example-jar

Keep snapshot as it is

Package:com.program2.maven.program2

**After entering above mentioned details click on Finish
You be able to see the automation build happening for Maven Jar Project**

```
C:\Users\CMRIT-ISE-L209-009\.p2\pool\plugins\org.eclipse.jst.jdt.openjdk.hotspot.jre.full.win32.x86_64.17.0.9.v20200922-1045\org\apache\maven\maven2\java\java-1.8.0-openjdk-1.8.0_242-b08-0ubuntu3~18.04~18.04.1.amd64.deb
Downloaded from : https://repo.maven.apache.org/maven2/java/java-1.8.0-openjdk-1.8.0_242-b08-0ubuntu3~18.04~18.04.1.amd64.deb
Downloading from : https://repo.maven.apache.org/maven2/com/intel/fortran/intelifort/19.0.0/intelifort-19.0.0.jar
Progress (1): 8.2/12 kB
Progress (1): 4.2/12 kB

Downloaded from : https://repo.maven.apache.org/maven2/com/intel/fortran/intelifort/19.0.0/intelifort-19.0.0.jar
Downloading from : https://repo.maven.apache.org/maven2/com/intel/fortran/intelifort/19.0.0/intelifort-19.0.0.jar
Progress (1): 8.2/62 kB
Progress (1): 8.2/62 kB
Progress (1): 0/62 kB
Progress (1): 8.2/62 kB
Progress (1): 8.2/62 kB
Progress (1): 0/62 kB
Progress (1): 8.2/62 kB
Progress (1): 8.2/62 kB
Progress (1): 0/62 kB
```

It asks for Configuration confirmation just click Y

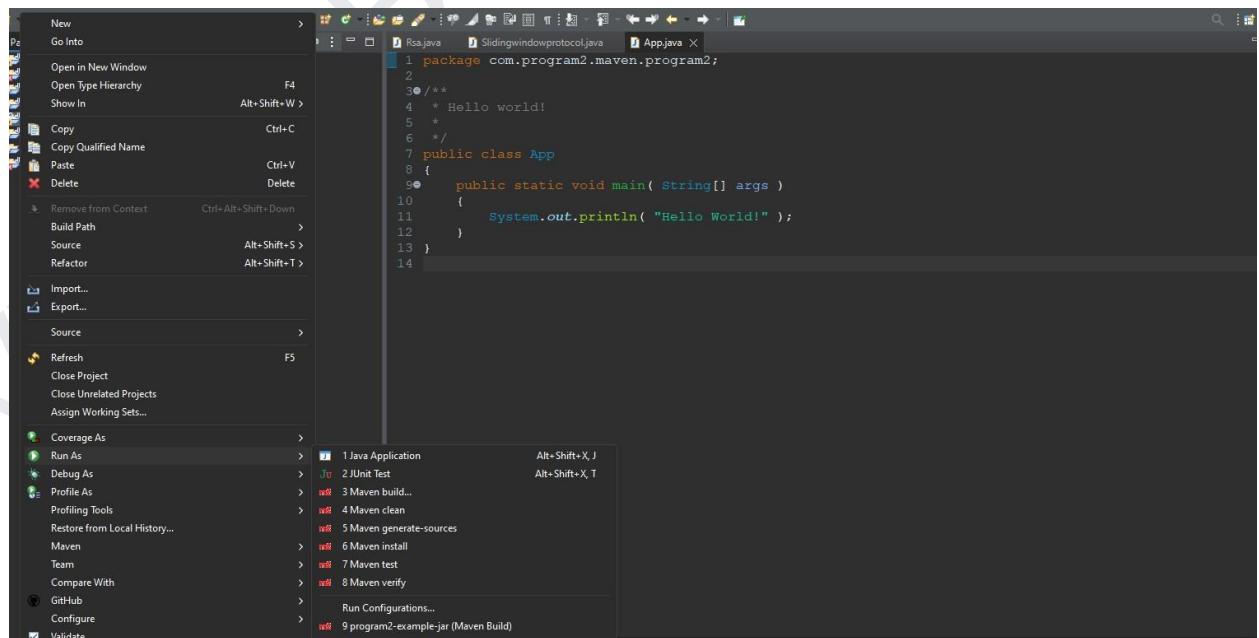
```
Confirm properties configuration:
groupId: com.program2.maven
artifactId: program2-example-jar
version: 0.0.1-SNAPSHOT
package: com.program2.maven.program2
```

The RESULT be as in below

```
package: com.program2.maven.program2
Y: Y
[INFO] -----
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-archetype-quickstart:1.1
[INFO] -----
[INFO] Parameter: basedir, Value: C:\Users\CMRIT-ISE-L209-009\Desktop\IS147
[INFO] Parameter: package, Value: com.program2.maven.program2
[INFO] Parameter: groupId, Value: com.program2.maven
[INFO] Parameter: artifactId, Value: program2-example-jar
[INFO] Parameter: packageName, Value: com.program2.maven.program2
[INFO] Parameter: version, Value: 0.0.1-SNAPSHOT
[INFO] project created from Old (1.x) Archetype in dir: C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\program2-example-
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 03:37 min
[INFO] Finished at: 2025-01-29T10:31:45+05:30
[INFO] -----
```

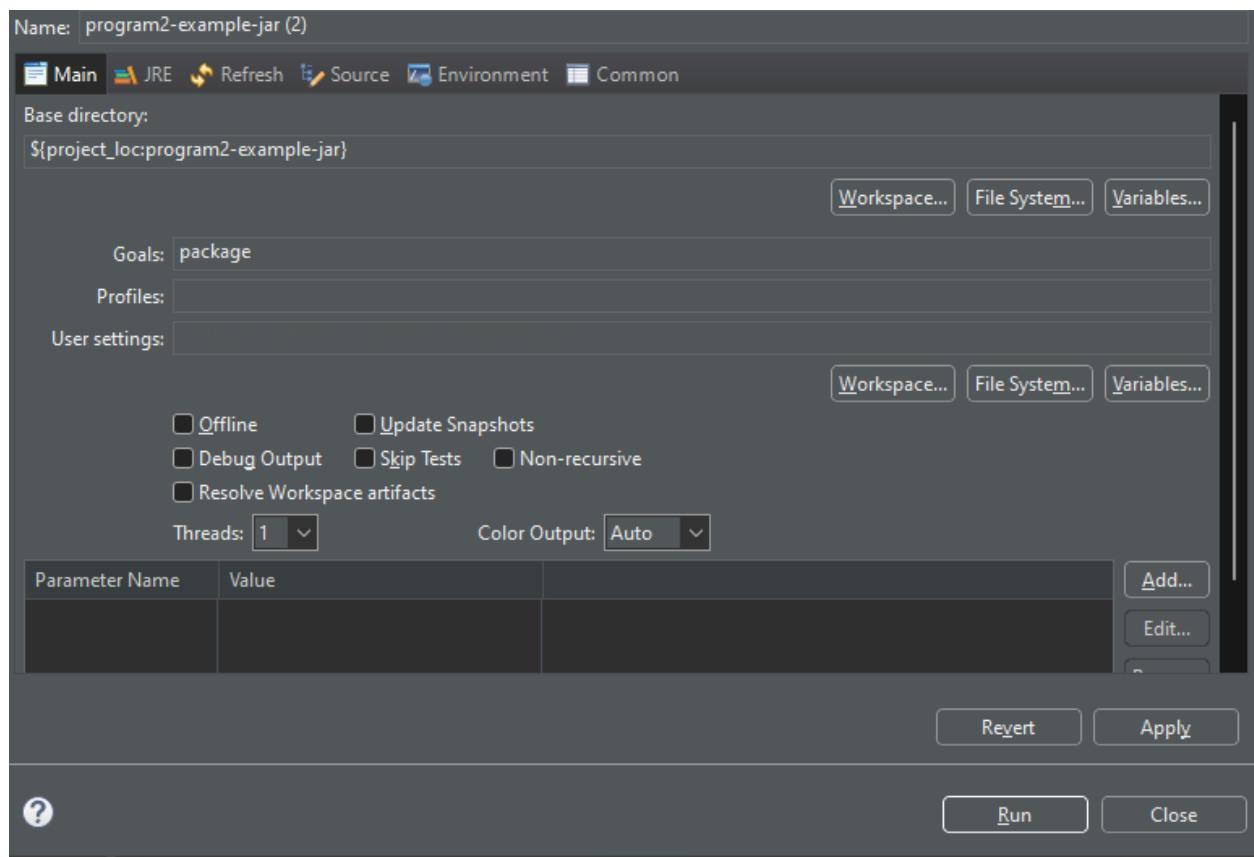
STEP5:Now its time to build Maven Project

**Go to Maven Project ----->Right Click on the Project and select
Maven Build**



After the above procedure is done

Select Goal as package

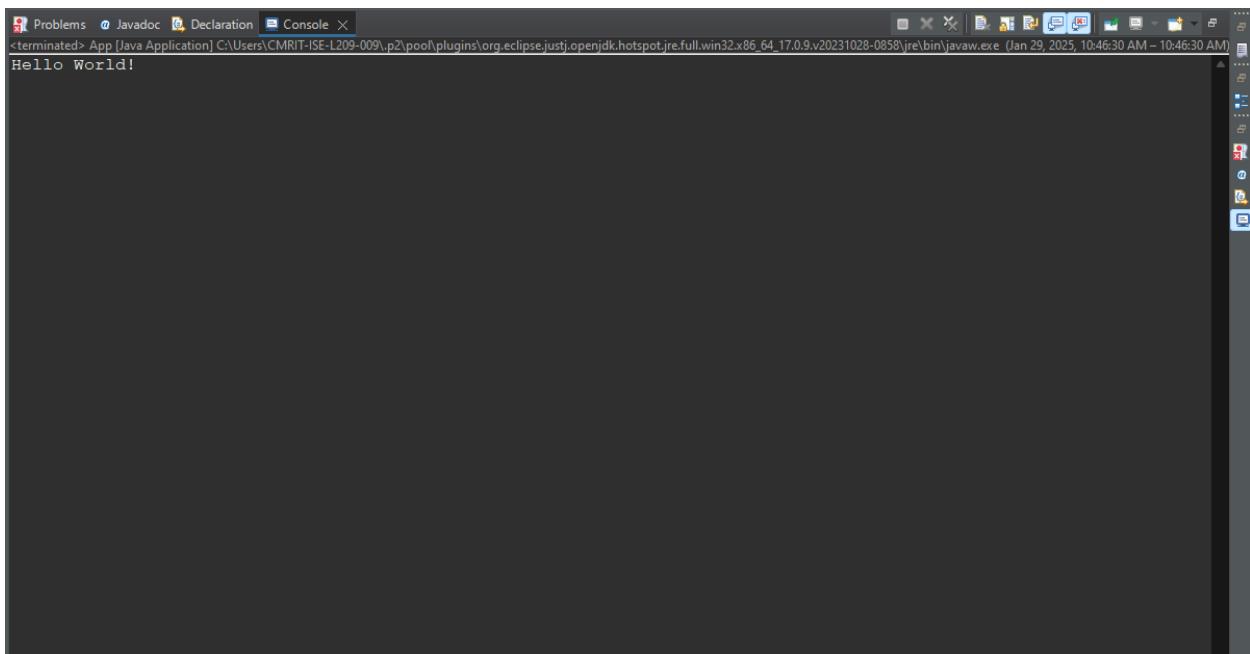


And Click Run

The result be as in below

```
[INFO] --- resources:3.1.0:resources (default-resources) @ program2-example-jar ---
[INFO] skip non existing resourceDirectory C:\Users\CMRIT-ISE-L209-009\Desktop\ISI47\program2-example-jar\src\main\
[INFO]
[INFO] --- compiler:3.11.0:compile (default-compile) @ program2-example-jar ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- resources:3.3.1:testResources (default-testResources) @ program2-example-jar ---
[INFO] skip non existing resourceDirectory C:\Users\CMRIT-ISE-L209-009\Desktop\ISI47\program2-example-jar\src\test\
[INFO]
[INFO] --- compiler:3.11.0:testCompile (default-testCompile) @ program2-example-jar ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- surefire:3.1.2:test (default-test) @ program2-example-jar ---
[INFO] Using auto detected provider org.apache.maven.surefire.junit.JUnit3Provider
[INFO]
[INFO] -----
[INFO] T E S T S
[INFO] -----
[INFO] Running com.program2.maven.program2.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.010 s -- in com.program2.maven.program2.AppTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.3.0:jar (default-jar) @ program2-example-jar ---
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 1.295 s
[INFO] Finished at: 2025-01-29T10:45:04+05:30
[INFO]
```

Now goto App.java finally run java application



The screenshot shows the Eclipse IDE interface with the 'Console' tab selected. The output window displays the text 'Hello World!' indicating the successful execution of a Java application named 'App'. The path to the application is shown as '<terminated> App [Java Application] C:\Users\CMRIT-ISE-L209-009\.p2\pool\plugins\org.eclipse.jdt.core\jar\hotspot\jre\full\win32\x86_64_17.0.9.v20231028-0859\jre\bin\javaw.exe'.

Description

What is groupId in maven ?

groupId identifies a particular project uniquely across all projects, so we should follow a naming convention. A very simple and commonly used way of doing this is to use the reverse of your domain, i.e. com.javarewind.maven.

A good way of maintaining the integrity of groupId is to use the project structure. In case the project consists of multiple modules then every module should append an identifier to the parent groupId. i.e. com.javarewind.maven, com.java.rewind.spring, com.javarewind.struts .. etc.

What is artifactId in maven ?

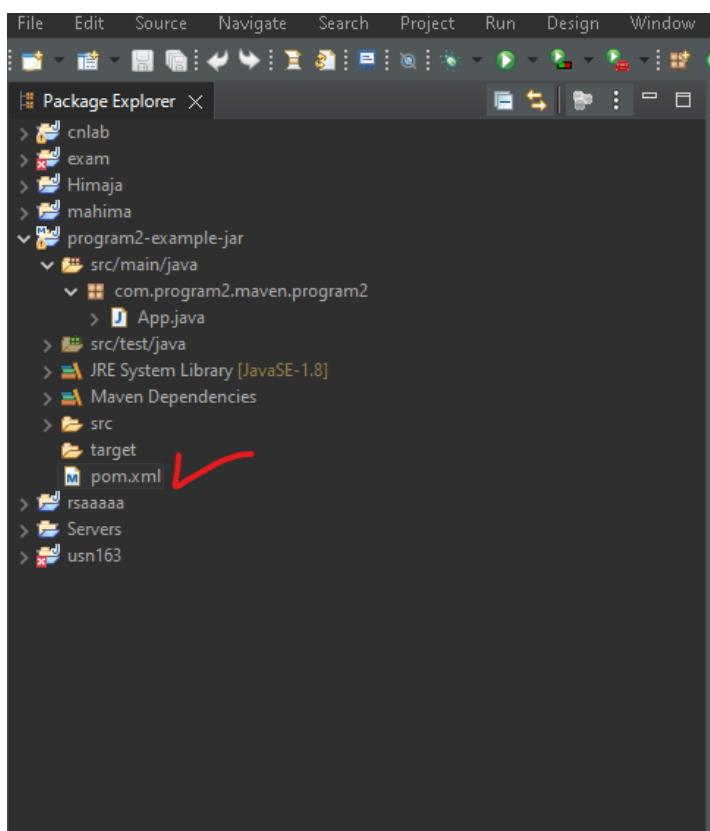
artifactId is the name of war file without version, if you are creating it by yourself you are free to took any name of your choice in lower case and without any strange symbol. But if this is a third party jar than we have to take the name of the jar as suggested by its distribution.

What is the archetype in maven ?

Archetype is a Maven project templating toolkit which tells the maven the type of project we are going to create. Archetype enables the maven to create a template project of the user's choice so that the user can get the project up and running instantly.

"archetype:generate" generates a new project from the provided archetype or updates the actual project if using a partial archetype. Maven provides a number of predefined archetypes, see more details from [Maven Documentation](#).

HOW POM.XML LOOKS IS AS IN SCREEN BELOW



```

1<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
2  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
3    <modelVersion>4.0.0</modelVersion>
4
5    <groupId>com.program2.maven</groupId>
6    <artifactId>program2-example-jar</artifactId>
7    <version>0.0.1-SNAPSHOT</version>
8    <packaging>jar</packaging>
9
10   <name>program2-example-jar</name>
11   <url>http://maven.apache.org</url>
12
13   <properties>
14     <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
15   </properties>
16
17   <dependencies>
18     <dependency>
19       <groupId>junit</groupId>
20       <artifactId>junit</artifactId>
21       <version>3.8.1</version>
22       <scope>test</scope>
23     </dependency>
24   </dependencies>
25 </project>
26

```

***PROGRAM3:Working with Gradle: Setting Up a Gradle Project,
Understanding Build Scripts (Groovy and Kotlin DSL), Dependency
Management and Task Automation***

STEP1:Let's do this in cmd prompt

Goto Command Prompt

Then first make a new directory the command is

mkdir pgm3

For changing to a current directory the command is

cd pgm3

Now run

gradle init

After execution of command the screen shows as below where we opt for build type select as 1

```
C:\Users\CMRIT-ISE-L209-009\gradletest>gradle init
Starting a Gradle Daemon (subsequent builds will be faster)

Select type of build to generate:
1: Application
2: Library
3: Gradle plugin
4: Basic (build structure only)
Enter selection (default: Application) [1..4] 1
```

After selecting application type next it asks for Implementation language select as Groovy

```
Select implementation language:
1: Java
2: Kotlin
3: Groovy
4: Scala
5: C++
6: Swift
Enter selection (default: Java) [1..6] 3
```

After selecting Implementation language it will ask for Java version and project name

```
 3. SWIPE
Enter selection (default: Java) [1..6] 3

Enter target Java version (min: 7, default: 21): 21

Project name (default: gradletest): gradletest
```

After providing version and project name

Select application structure as Single application structure and Domain Specific Language as Kotlin

```
Select application structure:
 1: Single application project
 2: Application and library project
Enter selection (default: Single application project) [1..2] 1

Select build script DSL:
 1: Kotlin
 2: Groovy
Enter selection (default: Groovy) [1..2] 1
```

After every procedure is over it shows Build successful

```
Generate build using new APIs and behavior (some features may change in the next minor release)? (default: no) [yes, no] yes

> Task :init
Learn more about Gradle by exploring our Samples at https://docs.gradle.org/8.12.1/samples/sample_building_groovy_applications.html

BUILD SUCCESSFUL in 2m 2s
1 actionable task: 1 executed
```

STEP2:Now its time to Build the script

Just type the command as:

gradlew run

It will take atleast 3-5 minutes to run the configuration script we have set through steps finally the output be as in below If You want to see the structure of an application run the command as **tree**

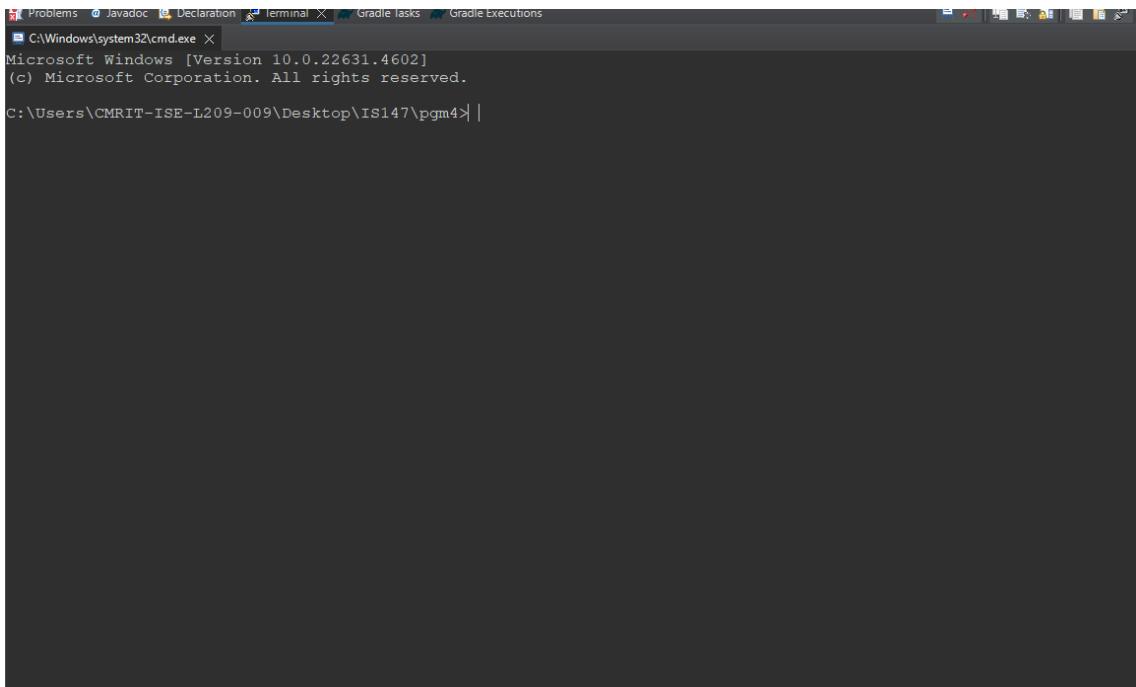
```
C:\Users\CMRIT-ISE-L209-009\gradletest>gradlew run
Calculating task graph as no cached configuration is available for tasks: run
> Task :app:run
Hello World!
```

```
C:\Users\CMRIT-ISE-L209-009\gradletest>tree
Folder PATH listing for volume Windows
Volume serial number is CA13-EB08
C:.
    +-- .gradle
        +-- 8.12.1
            +-- checksums
            +-- executionHistory
            +-- expanded
            +-- fileChanges
            +-- fileHashes
            +-- vcsMetadata
            +-- buildOutputCleanup
            +-- configuration-cache
                +-- 87330068-729b-48ed-8a38-57771bbaae67
                    +-- 8gybe7c3ykh3sf9t2sl1kie4w
                    +-- vcs-1
    +-- .settings
    +-- app
        +-- build
            +-- classes
                +-- groovy
                    +-- main
                        +-- org
                            +-- example
            +-- generated
                +-- sources
                    +-- annotationProcessor
                        +-- groovy
                            +-- main
            +-- tmp
                +-- compileGroovy
                    +-- groovy-java-stubs
        +-- src
            +-- main
                +-- groovy
                    +-- org
                        +-- example
                +-- resources
            +-- test
                +-- groovy
                    +-- org
```

PROGRAM4:Practical Exercise: Build and Run a Java Application with Maven, Migrate the Same Application to Gradle

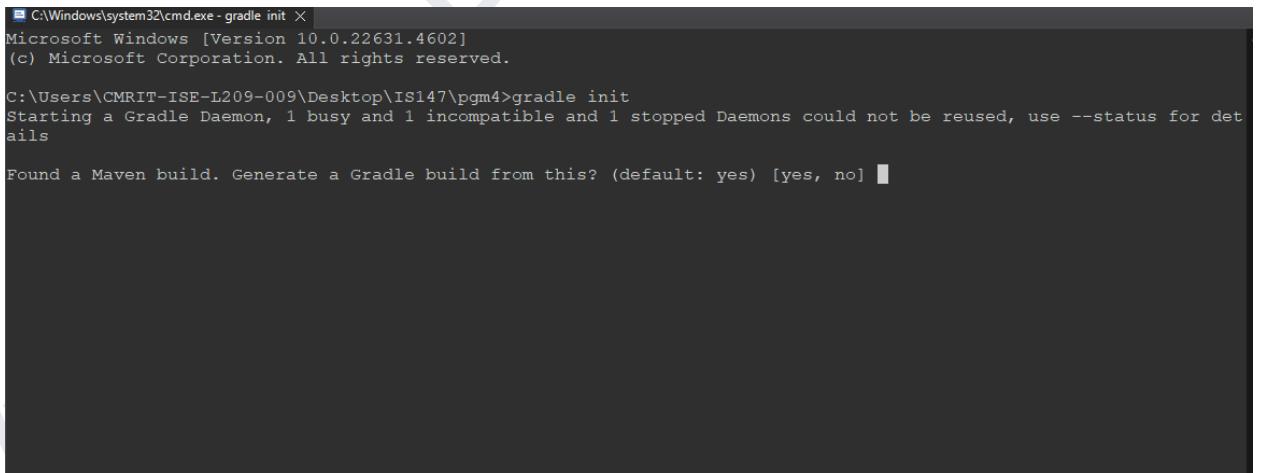
STEP1: First create a Maven Project as in PROGRAM2 then build the project and run java application you will get Hello World Message

STEP2: Then to migrate to gradle use shortcut Key **Ctrl+Alt+Shift+T** To get Terminal screen as in below:



A screenshot of a terminal window titled 'cmd.exe'. The window shows the following text:
Microsoft Windows [Version 10.0.22631.4602]
(c) Microsoft Corporation. All rights reserved.
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>|

STEP3: Type command **gradle init it will ask for migrate from maven to gradle type yes**



A screenshot of a terminal window titled 'cmd.exe - gradle init'. The window shows the following text:
Microsoft Windows [Version 10.0.22631.4602]
(c) Microsoft Corporation. All rights reserved.
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>gradle init
Starting a Gradle Daemon, 1 busy and 1 incompatible and 1 stopped Daemons could not be reused, use --status for details
Found a Maven build. Generate a Gradle build from this? (default: yes) [yes, no] |

STEP4: After the above command is validated to yes it prompts to select Domain Specific Language as in screen below select 2 (as we have done for Kotlin)

```
Select build script DSL:
 1: Kotlin
 2: Groovy
Enter selection (default: Kotlin) [1..2] 2
```

STEP5:After selecting Groovy it asks for validating prompt for API Generator just validate as yes

```
C:\Windows\system32\cmd.exe - gradle init X

C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>gradle init

Found a Maven build. Generate a Gradle build from this? (default: yes) [yes, no] yes

Select build script DSL:
 1: Kotlin
 2: Groovy
Enter selection (default: Kotlin) [1..2] 2

Generate build using new APIs and behavior (some features may change in the next minor release)? (default: no) [yes, no] ||
```

Finally it runs the init phase as been selected

```
> Task :init
Maven to Gradle conversion is an incubating feature.
For more information, please refer to https://docs.gradle.org/8.12.1/userguide/migrating_from_maven.html in the Gradle documentation.

BUILD SUCCESSFUL in 6m 44s
1 actionable task: 1 executed
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4> |
```

STEP6:

**Type the command
gradle build**

```
C:\Windows\system32\cmd.exe X

C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>gradle build
reusing configuration cache.

BUILD SUCCESSFUL in 759ms
1 actionable tasks: 4 up-to-date
Configuration cache entry reused.
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>
```

Now to get exact program output of our java file Locate to build gradle File from ur local repository and Copy paste the code as in below shown in red color

```
plugins {
    id("java-library")
    id("maven-publish")
    id("application")
}

application {
    mainClass.set("com.pgm4.test.App") // Use .set() for properties
}

repositories {
    mavenCentral()
    // Uncomment if you need to publish locally
    // mavenLocal()
}

dependencies {
    testImplementation("junit:junit:4.13.2") // Use Kotlin syntax for dependencies
}

group = "com.pgm4.test"
version = "0.0.1-SNAPSHOT"
description = "pgm4"
java.sourceCompatibility = JavaVersion.VERSION_11 // Consider upgrading

publishing {
    publications {
        create<MavenPublication>("maven") {
            from(components["java"])
        }
    }
}

tasks.withType<JavaCompile>().configureEach {
    options.encoding = "UTF-8"
}
```

```
tasks.withType<Javadoc>().configureEach {  
    options.encoding = "UTF-8"  
}
```

AFTER DOING ALL CHANGES FINAL STEP

To run commands

gradle clean build

gradle run

You will get Output as

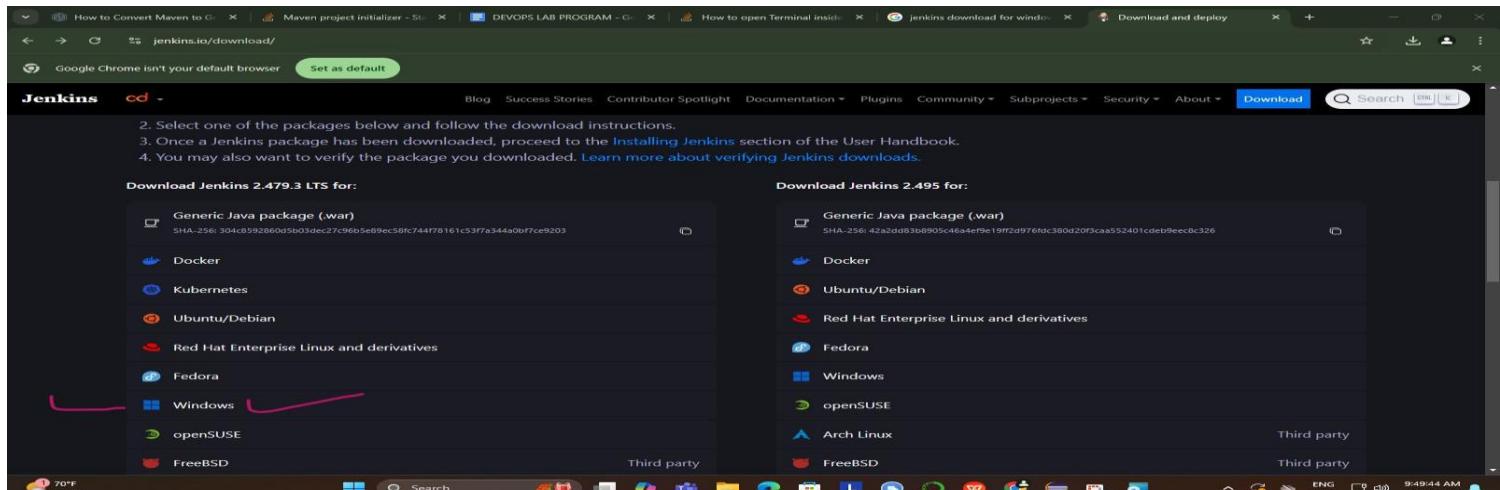
Hello World! Welcome to pgm4

```
BUILD SUCCESSFUL in 1s  
8 actionable tasks: 6 executed, 2 from cache  
Configuration cache entry stored.  
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>gradle run  
Calculating task graph as configuration cache cannot be reused because file 'build.gradle' has changed.  
  
> Task :run  
Hello World! Welcome to pgm4  
  
BUILD SUCCESSFUL in 883ms  
2 actionable tasks: 1 executed, 1 up-to-date  
Configuration cache entry stored.  
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4>gradlew run  
Reusing configuration cache.  
  
> Task :run  
Hello World! Welcome to pgm4  
  
BUILD SUCCESSFUL in 810ms  
2 actionable tasks: 1 executed, 1 up-to-date  
Configuration cache entry reused.  
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4> |
```

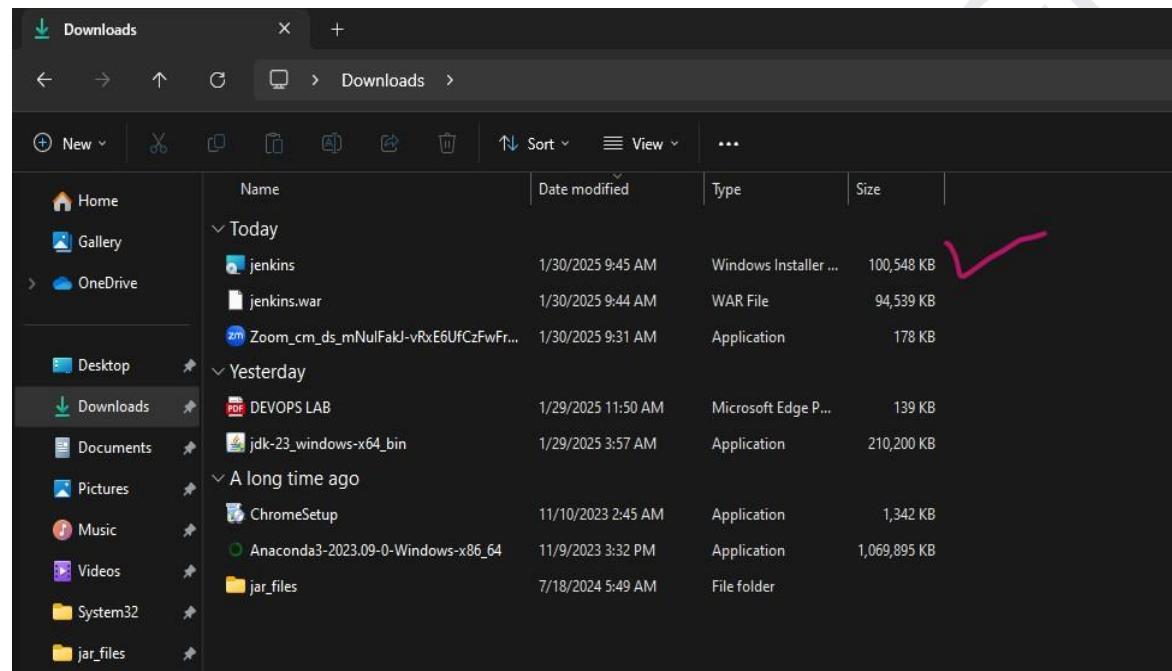
PROGRAM5:Introduction to Jenkins: What is Jenkins?, Installing Jenkins on Local or Cloud Environment, Configuring Jenkins for First Use .

STEP1: Type jenkins download for windows

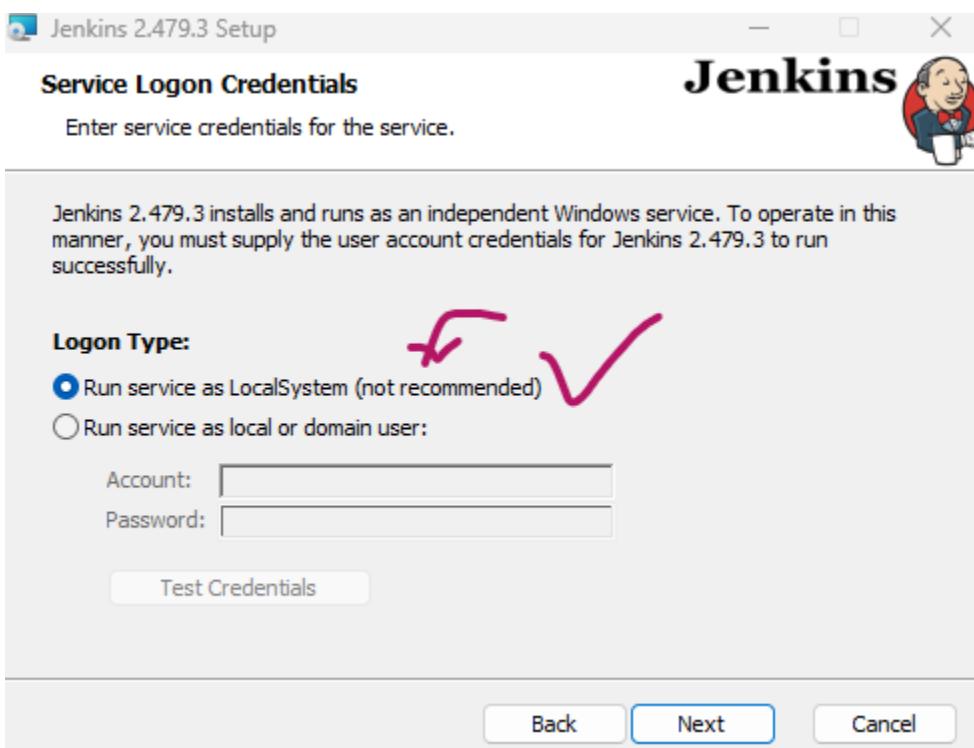
<https://www.jenkins.io/download/>



STEP2: After clicking on Windows Jenkins MSI Installer exe file will be installed

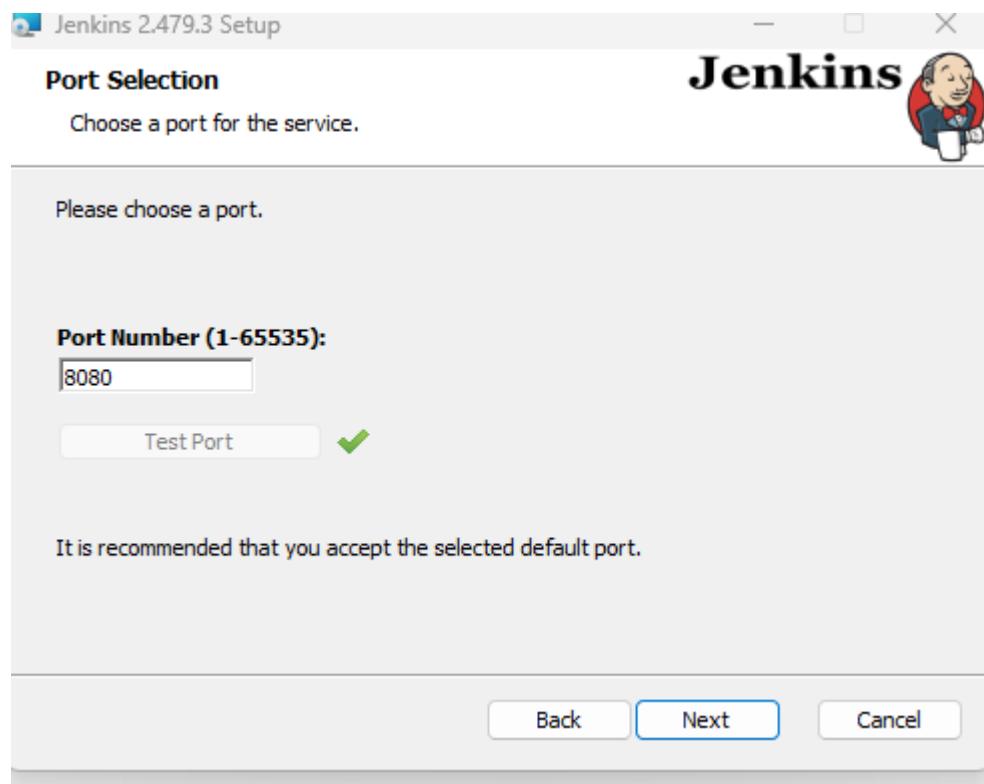


STEP3: Go to Jenkins MSI Installer click on it & opt for “Run service as Local System”



XX Need not to Provide Account & Password XX

STEP4: Choose a port as 8080 and test the port and click Next



STEP5:It takes current jdk version that's available for safer side once goto cmd prompt and type command

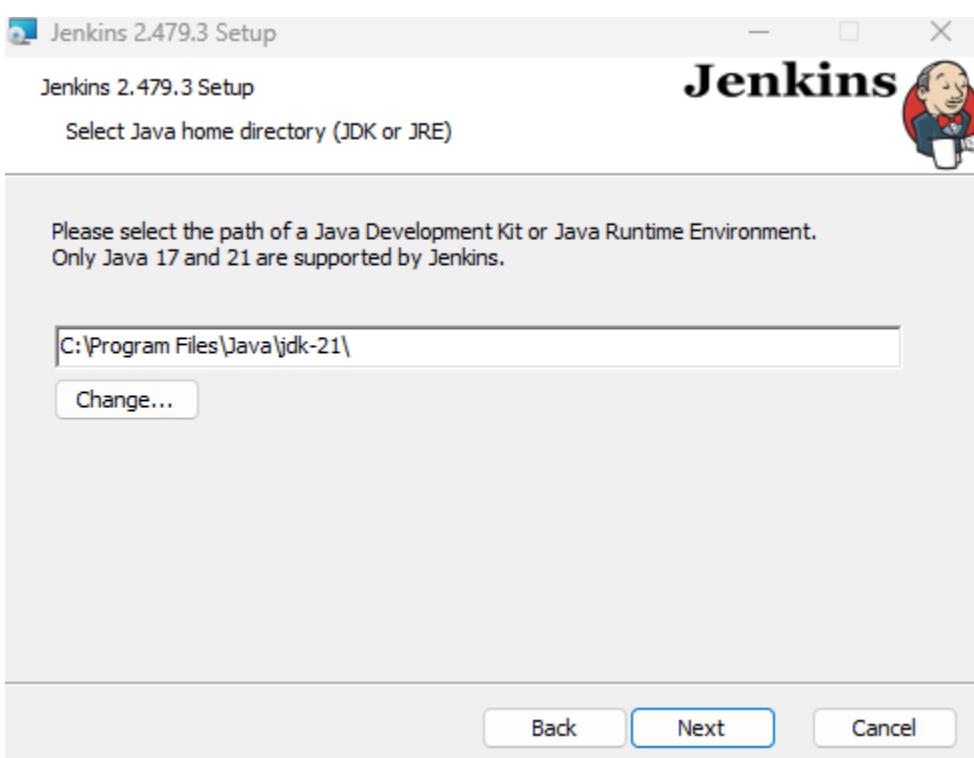
java -version

If matching click next

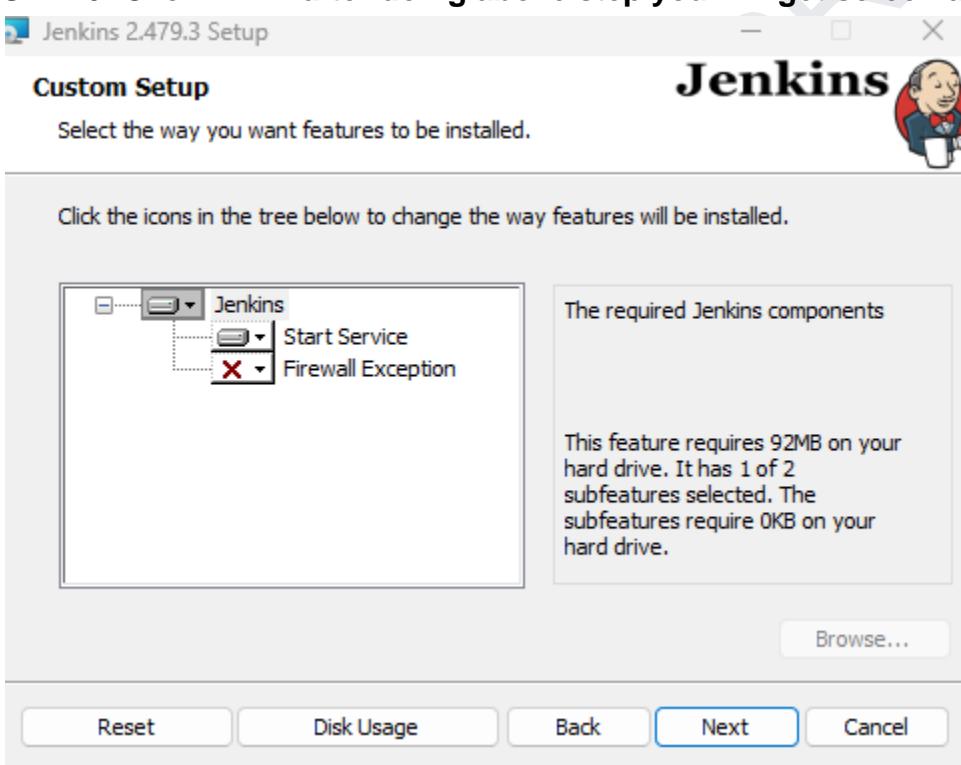
If failed to accept download jdk version 17 to 21 any of it

<https://www.oracle.com/java/technologies/javase/jdk21-archive-downloads.html>

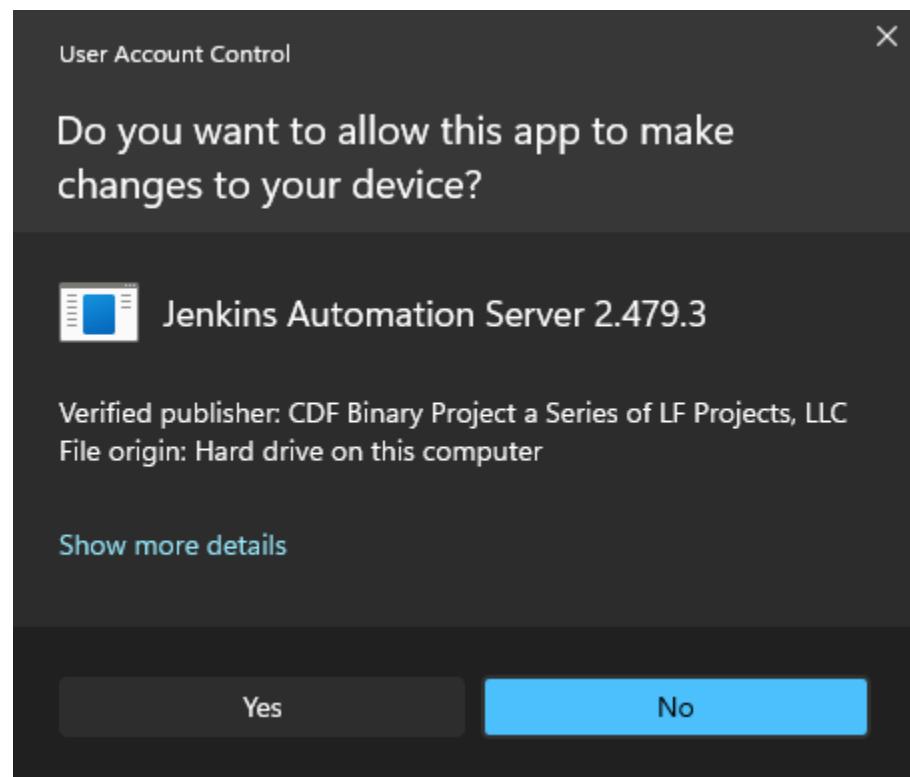
Platform	File Type	Size	Link
Linux x64 Debian Package	http	160.30 MB	https://download.oracle.com/java/21/archive/jdk-21.0.5_linux-x64_bin.deb (sha256)
Linux x64 RPM Package	http	188.18 MB	https://download.oracle.com/java/21/archive/jdk-21.0.5_linux-x64_bin.rpm (sha256)
macOS Arm 64 Compressed Archive	http	182.27 MB	https://download.oracle.com/java/21/archive/jdk-21.0.5_macos-aarch64_bin.tar.gz (sha256)
macOS Arm 64 DMG Installer	https://download.oracle.com/java/21/archive/jdk-21.0.5_macos-aarch64_bin.dmg	181.55 MB	(sha256)
macOS x64 Compressed Archive	https://download.oracle.com/java/21/archive/jdk-21.0.5_macos-x64_bin.tar.gz	184.51 MB	(sha256)
macOS x64 DMG Installer	https://download.oracle.com/java/21/archive/jdk-21.0.5_macos-x64_bin.dmg	183.85 MB	(sha256)
Windows x64 Compressed Archive	https://download.oracle.com/java/21/archive/jdk-21.0.5_windows-x64_bin.zip	185.91 MB	(sha256)
Windows x64 Installer	https://download.oracle.com/java/21/archive/jdk-21.0.5_windows-x64_bin.exe	164.28 MB	(sha256)
Windows x64 msi Installer	https://download.oracle.com/java/21/archive/jdk-21.0.5_windows-x64_bin.msi	163.03 MB	(sha256)



STEP6: Click NEXT after doing above step you will get screen as in Below again continue to click Next



STEP7: The popup allow format comes for Java Automation Server allow it click install----- > Finally Click Finish



Now By default Our Jenkins run at

<http://localhost:8080/>

Final step very important Once  It will ask for Administrator Password so u should locate as in directory mention copy paste as in mention in file location:
C:\ProgramData\Jenkins\.jenkins\secrets\initialAdminPassword and paste password as in mentioned belows administration password



Then select Install Suggested Plugins it starts to install as in shown below

Getting Started

Getting Started

<input checked="" type="checkbox"/> Folders	<input checked="" type="checkbox"/> OWASP Markup Formatter	<input checked="" type="checkbox"/> Build Timeout	<input checked="" type="checkbox"/> Credentials Binding	Jenkins OWASP Markup Formatter ** ASM API ** JSON Path API ** Structs ** Pipeline: Step API ** Token Macro Build Timeout ** bouncycastle API ** Credentials ** Plain Credentials ** Variant ** SSH Credentials Credentials Binding ** SCM API ** Pipeline: API ** commons-lang3 v3.x Jenkins API Timestamper ** Caffeine API ** Script Security ** JavaBeans Activation Framework (JAF) API ** JAXB ** SnakeYAML API ** - required dependency
<input checked="" type="checkbox"/> Timestamper	<input type="checkbox"/> Workspace Cleanup	<input type="checkbox"/> Ant	<input type="checkbox"/> Gradle	
<input type="checkbox"/> Pipeline	<input type="checkbox"/> GitHub Branch Source	<input type="checkbox"/> Pipeline: GitHub Groovy Libraries	<input type="checkbox"/> Pipeline Graph View	
<input type="checkbox"/> Git	<input type="checkbox"/> SSH Build Agents	<input type="checkbox"/> Matrix Authorization Strategy	<input type="checkbox"/> PAM Authentication	
<input type="checkbox"/> LDAP	<input type="checkbox"/> Email Extension	<input type="checkbox"/> Mailer	<input type="checkbox"/> Dark Theme	

Jenkins 2.479.3

Then it asks for minimum registration **You can skip and continue as admin**

Getting Started

Create First Admin User

Username

Password

Confirm password

Full name

E-mail address

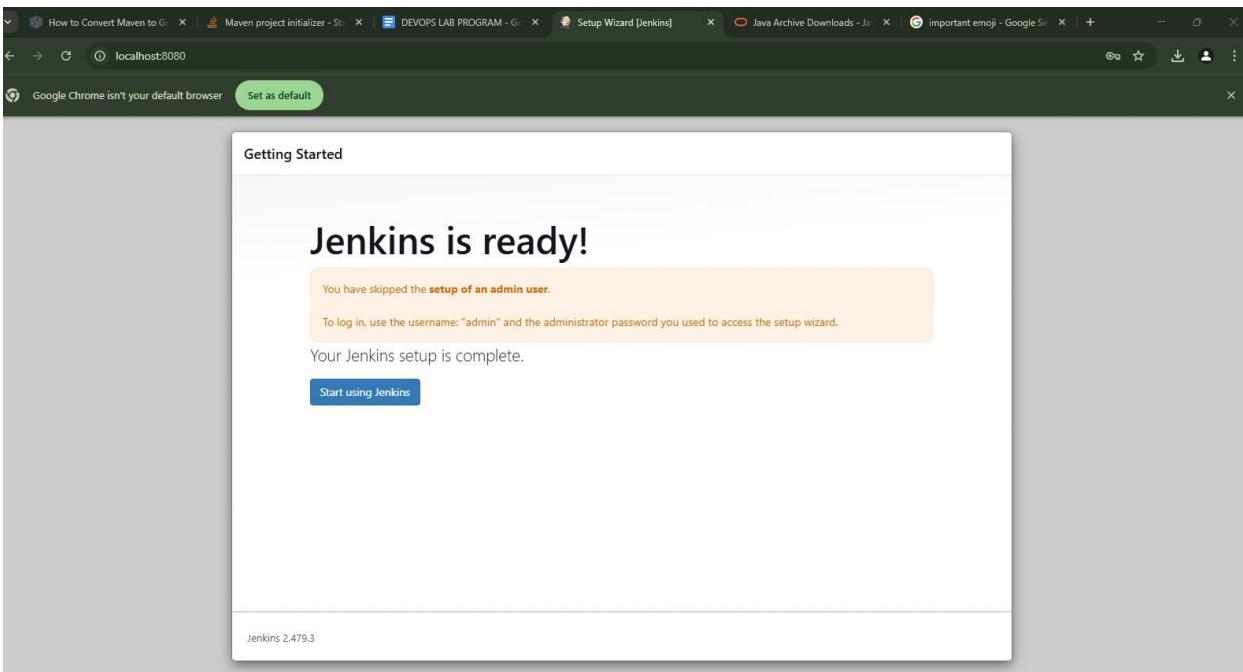
Skip and continue as admin

Save and Continue

Jenkins 2.479.3



Final screen be:



PROGRAM6 :Continuous Integration with Jenkins: Setting Up a CI Pipeline, Integrating Jenkins with Maven/Gradle, Running Automated Builds and Tests

How Is Jenkins Used for Continuous Integration?

Continuous Integration (CI) is a software development practice where developers integrate code into a shared repository frequently, usually several times a day. Jenkins is an open-source automation server that facilitates CI by automating the build, testing, and deployment processes.

With Jenkins, developers can easily detect and fix integration issues early, improving collaboration and accelerating software delivery. By continuously integrating code, teams can maintain a high level of code quality, reduce development time, and minimize the risk of release failures.

Continuous Integration Features in Jenkins

Continuous integration involves the automatic building and testing of code whenever changes are committed to the version control system. Jenkins provides several features that facilitate CI, including:

- **Version control system integration:** Jenkins integrates with various version control systems (VCS) such as Git, Subversion, and Mercurial. This allows Jenkins to monitor repositories for changes, trigger builds, and incorporate updates automatically.
- **Build automation:** Jenkins supports build automation using build tools like Maven, Gradle, and Ant. It can compile, package, and deploy code, ensuring that the latest changes are continuously integrated into the software project.
- **Automated testing:** Jenkins can execute automated tests for each build, using testing frameworks like JUnit, TestNG, and Selenium. This ensures that any issues introduced during development are quickly detected and reported, allowing developers to address them promptly.
- **Pipeline as code:** Jenkins Pipeline allows users to define their entire CI/CD pipeline as code using a domain-specific language called “Groovy.” This makes the pipeline easily versionable, shareable, and more maintainable.
- **Distributed builds:** Jenkins supports distributed builds across multiple build agents, which allows for faster and more efficient build processes by distributing the workload across multiple machines.
- **Plugins and extensibility:** Jenkins offers a vast ecosystem of plugins that extend its functionality, allowing users to customize and adapt Jenkins to their specific needs. Plugins are available for various tasks, such as integrating with different VCS, build tools, notification systems, and more.
- **Notifications and reporting:** Jenkins can send notifications through various channels like email, Slack, or other messaging systems to keep the team informed about build status, test results, and potential issues. It also generates reports and visualizations for various metrics, such as test results, code coverage, and build trends.
- **Access control and security:** Jenkins provides fine-grained access control and user management, allowing administrators to control who can access specific projects, pipelines, or configuration settings. It also supports integration with LDAP and Active Directory for centralized user management.
- **REST API:** Jenkins exposes a REST API that enables users to interact with Jenkins programmatically, allowing for integration with external tools, automation, and custom applications.

Benefits and Drawbacks of Using Jenkins for CI

Jenkins CI offers numerous benefits that can streamline software development processes and improve overall efficiency:

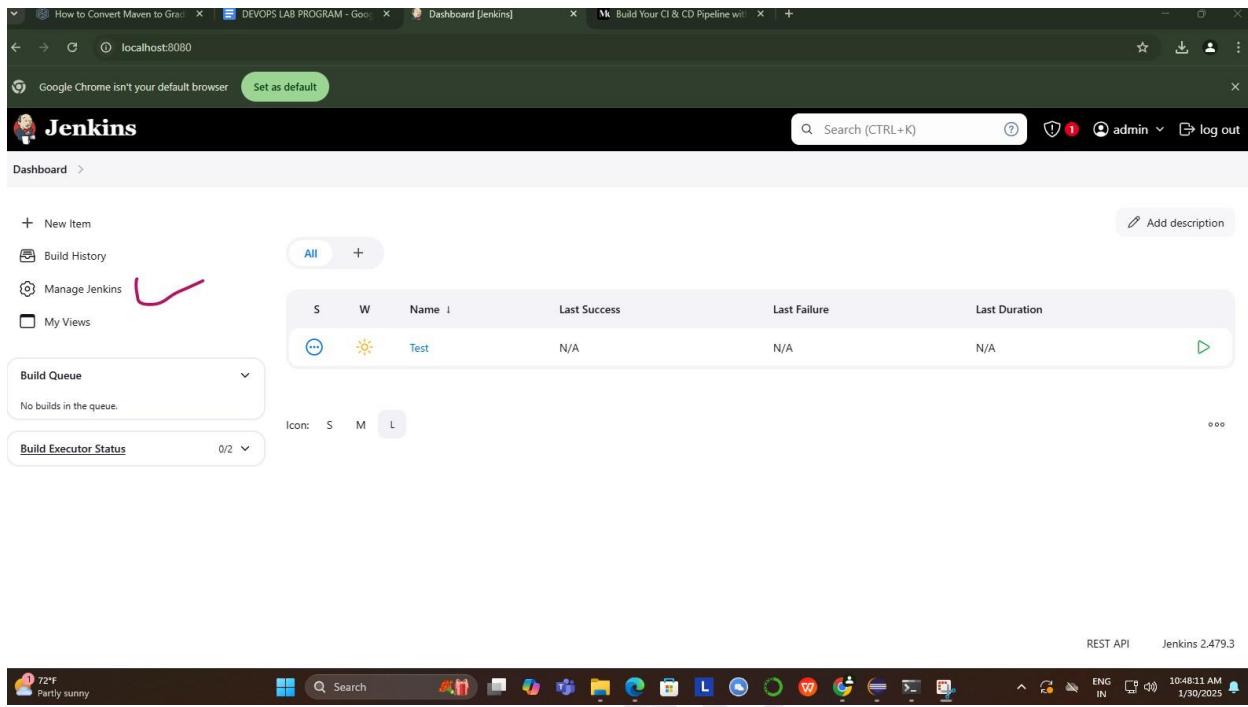
- **Shorter development cycles:** By automating repetitive tasks such as building, testing, and deployment, Jenkins CI reduces the time developers spend on manual tasks, enabling them to focus on writing code and addressing critical issues. This accelerates the development cycle and speeds up time-to-market.
- **Fast code integration:** Jenkins CI facilitates frequent code integration into a shared repository, making it easier to detect and fix integration issues early on. This prevents the accumulation of integration problems, leading to more stable and reliable software.
- **Short feedback loops:** The automation provided by Jenkins CI allows developers to receive immediate feedback on the success or failure of their code changes. Rapid feedback helps in identifying problems early, ensuring that they can be addressed before they become more difficult and time-consuming to resolve.
- **Automated workflows:** Jenkins CI can be configured to trigger automated workflows based on specific events, such as code commits or pull requests. This enables a seamless and efficient flow of work, helping teams maintain a high level of productivity and consistency.

However, there are potential concerns associated with using Jenkins CI:

- **Expense:** Although Jenkins itself is an open-source tool, the resources and infrastructure required to run and maintain it can be costly, especially for larger projects or organizations. Costs may include hardware, cloud services, or additional plugins and integrations needed for specific use cases.
- **Maintenance:** Jenkins CI requires regular maintenance to ensure its optimal performance, including updating plugins, monitoring the system for potential issues, and troubleshooting any problems that arise. This maintenance can be time-consuming and may require dedicated personnel with expertise in Jenkins and the underlying technologies.
- **Not cloud native:** Jenkins was designed before the advent of cloud computing, which means it doesn't naturally lend itself to cloud-based environments. To make Jenkins work in a cloud environment, substantial customization and additional tooling may be needed.

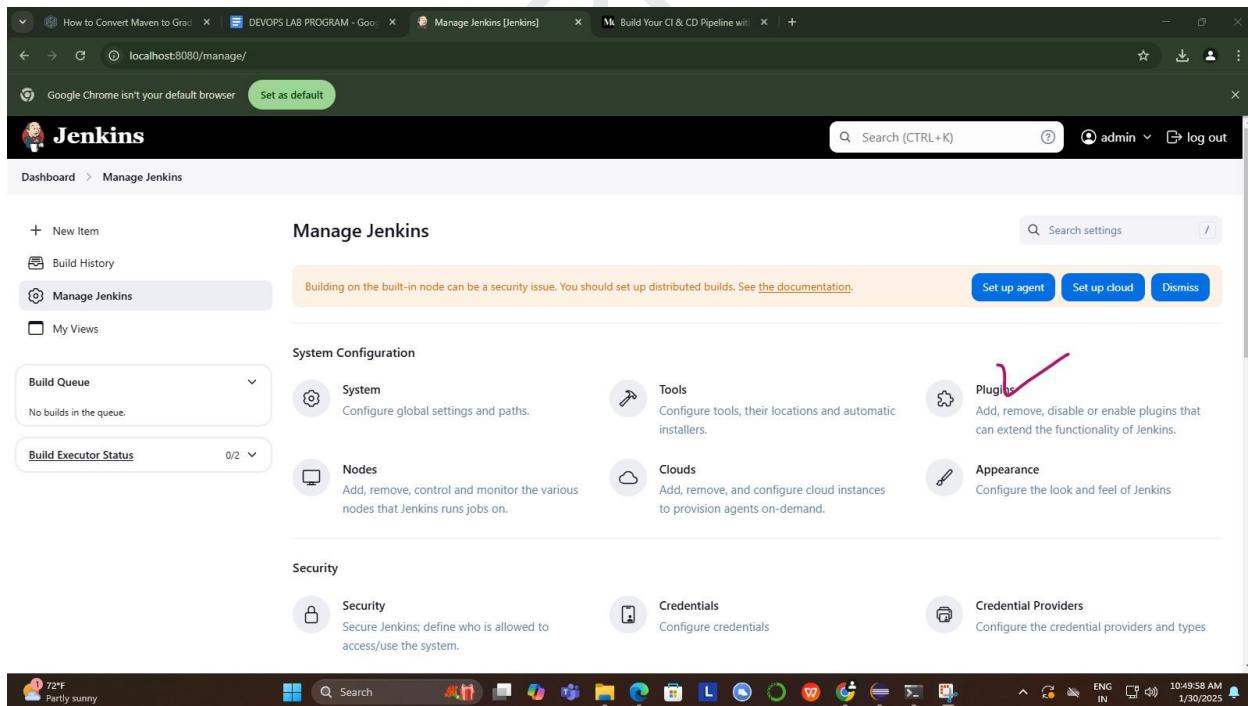
STEP1: Now coming to our Program to set CI Pipeline for Maven

Go to Jenkins Dashboard and Click on Manage Jenkins



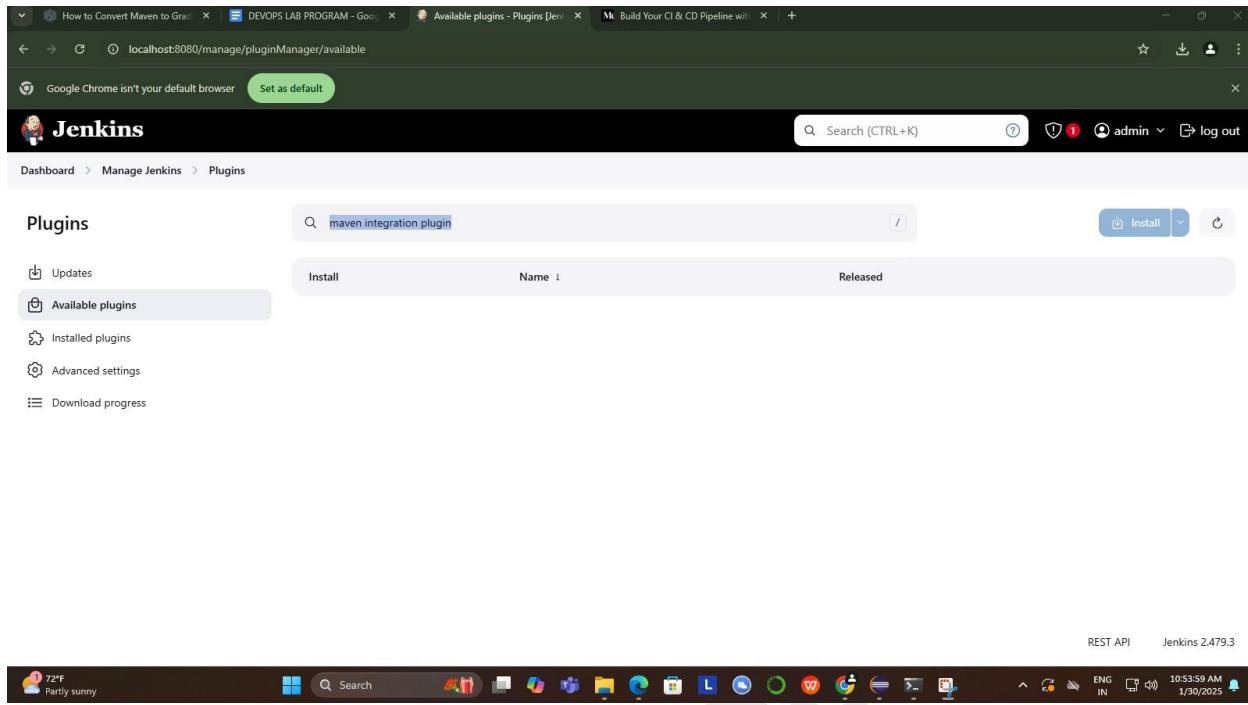
The screenshot shows the Jenkins dashboard. At the top, there are several tabs: 'How to Convert Maven to Gradle', 'DEVOPS LAB PROGRAM - Go...', 'Dashboard [Jenkins]', and 'Build Your CI & CD Pipeline with...'. Below the tabs, the URL 'localhost:8080' is displayed. A message 'Google Chrome isn't your default browser' with a 'Set as default' button is shown. The main area has a 'Jenkins' logo and a search bar. On the left, there's a sidebar with links like '+ New Item', 'Build History', 'Manage Jenkins' (which is highlighted with a red arrow), and 'My Views'. The main content area shows a table with columns 'S', 'W', 'Name', 'Last Success', 'Last Failure', and 'Last Duration'. One row is visible: 'Test' with 'N/A' in all other columns. There are also sections for 'Build Queue' (empty) and 'Build Executor Status' (0/2). The bottom right corner shows 'REST API' and 'Jenkins 2.479.3'.

STEP2: Select Plugins

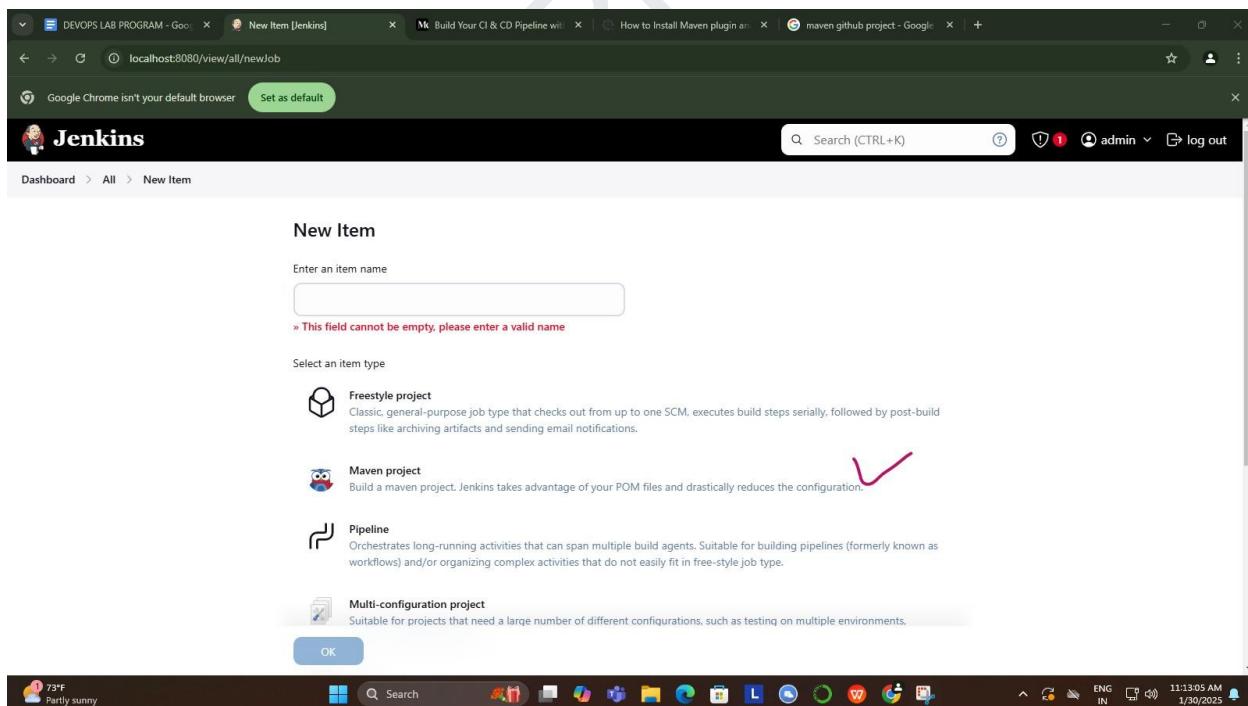


The screenshot shows the 'Manage Jenkins' page. The title 'Manage Jenkins' is at the top. Below it, a message says 'Building on the built-in node can be a security issue. You should set up distributed builds. See the documentation.' with three buttons: 'Set up agent', 'Set up cloud', and 'Dismiss'. The main area is titled 'System Configuration' and contains several sections: 'Build Queue' (empty), 'Build Executor Status' (0/2), 'System' (Configure global settings and paths), 'Nodes' (Add, remove, control and monitor nodes), 'Tools' (Configure tools), 'Clouds' (Add, remove, configure cloud instances), 'Appearance' (Configure look and feel), 'Security' (Secure Jenkins), 'Credentials' (Configure credentials), and 'Credential Providers' (Configure credential providers). The 'Plugins' section is highlighted with a red arrow. The bottom right corner shows '72°F Partly sunny' and a system tray with various icons.

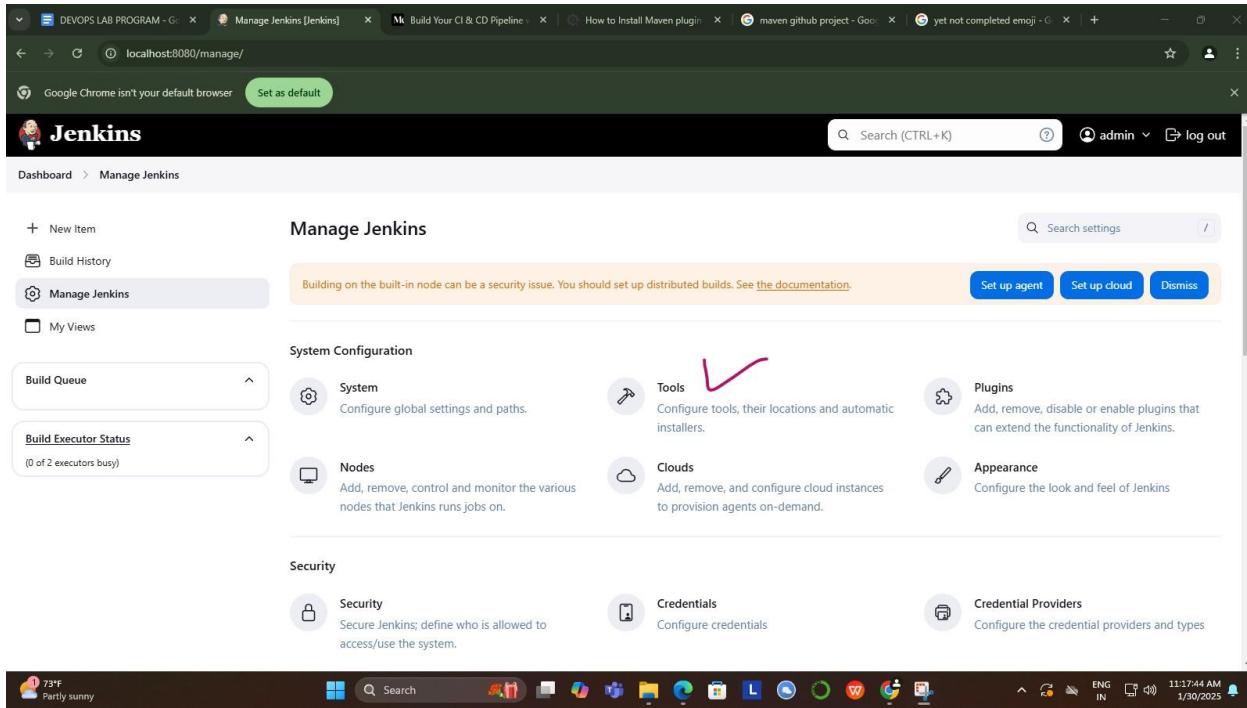
STEP3: Search for Maven IntegrationPlugin in Available Plugins and Install



STEP4: After Maven Integration Plugin is Installed We able to see Maven Project as New Item



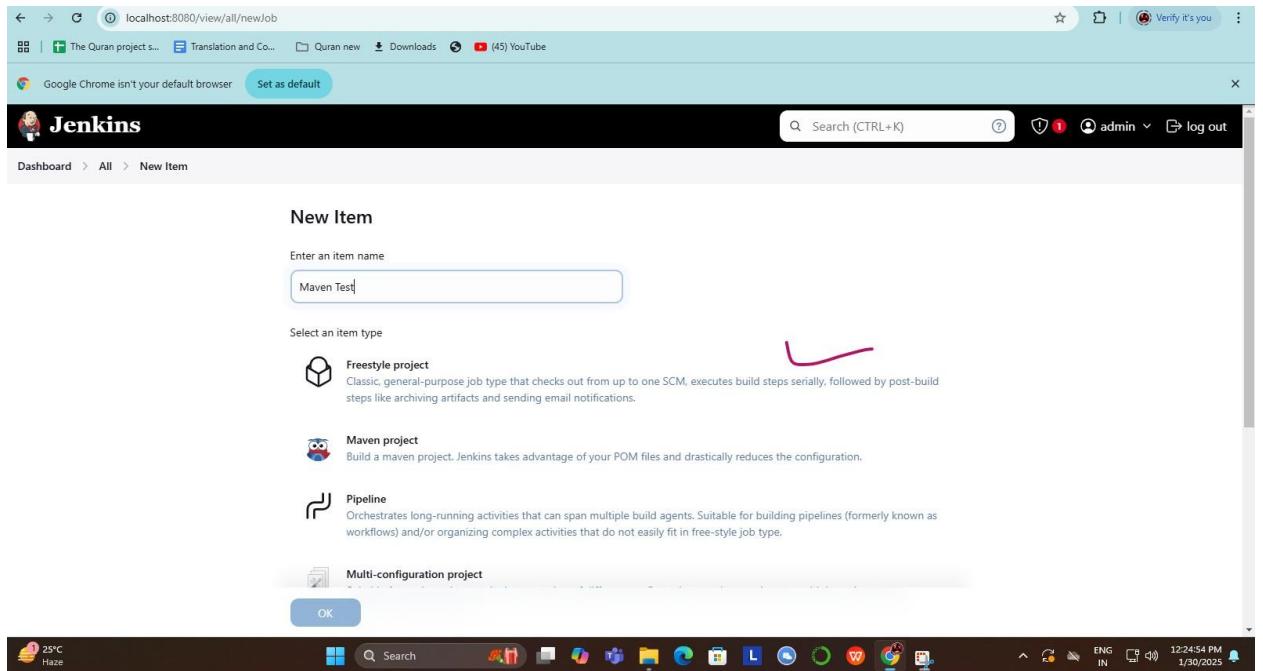
STEP5: YET not completed  **we have to configure the Location to properly Build and Run Maven Project**
So again click on Manage Jenkins and select Tools



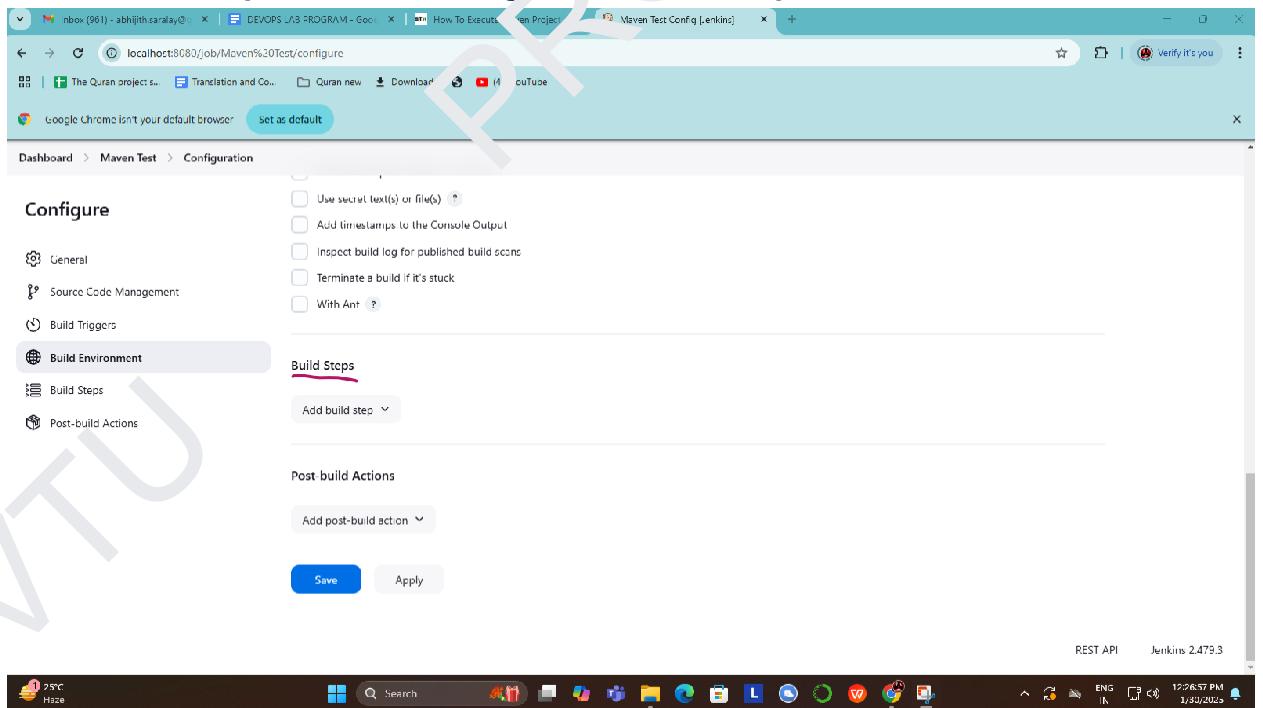
The screenshot shows the Jenkins Manage Jenkins page. On the left, there's a sidebar with links like 'New Item', 'Build History', 'Manage Jenkins' (which is selected and highlighted in blue), and 'My Views'. The main content area is titled 'Manage Jenkins' and contains several sections: 'System Configuration' (with 'System', 'Nodes', 'Tools', 'Clouds', and 'Plugins' sub-links), 'Security' (with 'Security', 'Credentials', and 'Credential Providers' sub-links), and a 'Search settings' bar at the top right. A prominent red checkmark is drawn over the 'Tools' link in the System Configuration section.

STEP6: Now lets not select Maven Project as new Item as we already have Maven project in local systems lets see how we can run the Maven Project with POM.XML

- Click on New Item**
- Provide Item Name and select Freestyle Project**

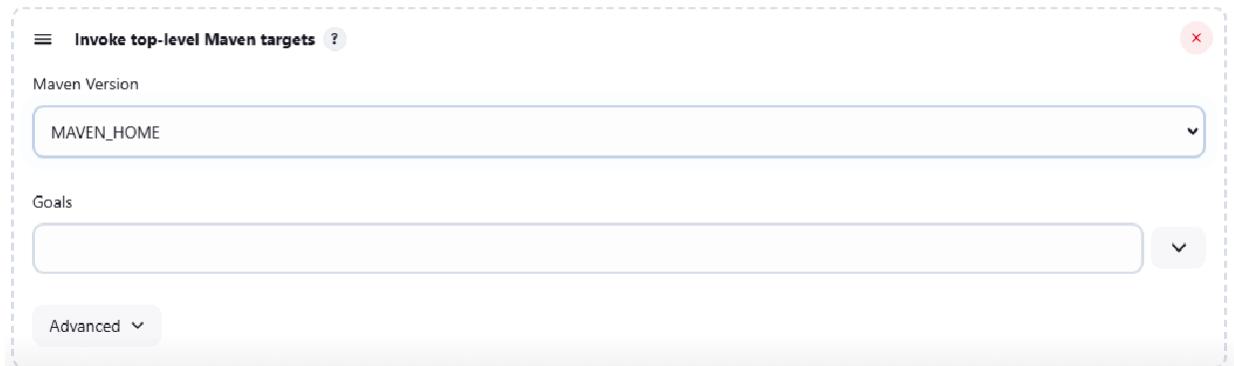


- c) Scroll down to 'Build' option. Click on 'Add Build Step' and choose the value 'Invoke top-level Maven targets' from the drop down list.



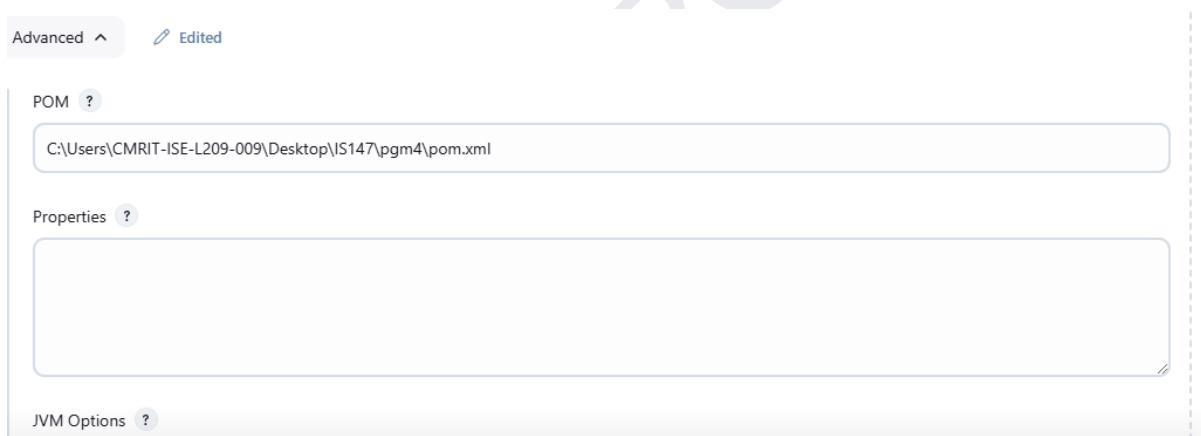
- d) After selecting Invoke top-level Maven targets opt for proper environment version as in set in previous steps in my case its MAVEN_HOME

Build Steps



- e) Enter Goal as
clean install

- f) Before you save and apply just below Goal there is Advance option add pom.xml path



Goto pom.xml of your particular pgm and take path in my case its
C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4\pom.xml

After all Steps is over click on **Build button** the output be as in below

Jenkins

Dashboard > Maven Test >

Maven Test

Status: ✓ Maven Test

Permalinks:

- Last build (#11), 3 min 23 sec ago
- Last stable build (#11), 3 min 23 sec ago
- Last successful build (#11), 3 min 23 sec ago
- Last completed build (#11), 3 min 23 sec ago

Builds:

Filter:

Today: #11 12:51PM

REST API Jenkins 2.179.3

26°C Jaze

Search, File Explorer, Taskbar icons, System tray.

To see either click on build texts and goto console output or u can goto dashboard and opt to see build scripts.

Inbox (96) - abhijith.sarayil@... | DLVOPS LAB PROG (AM - Go... | How to Execute Maven Project | Maven test #11 Console Jenkins | How to run Java program using... | +

localhost:8080/job/Maven%20Test/lastBuild/console

The Quran project... Translation and Co... Quran new Downloads YouTube

Google Chrome is your default browser Set as default

Jenkins

Dashboard > Maven Test > #11 > Console Output

Console Output

Started by user admin
Running as SYSTEM

```

Building in workspace C:\ProgramData\Jenkins\jenkins\workspace\Maven Test
[Maven Test] $ cmd.exe /C ""C:\Program Files\apache-maven-3.9.2\bin\mvn.cmd" -f C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4\pom.xml clean install
&& exit %%ERRRCI PVF %%"
[INFO] Scanning for projects...
[INFO]
[INFO] -----< ccm.pgm4.dev:pgm4 >-----
[INFO] building pgm4 0.0.1 SNAPSHOT
[INFO]   from pom.xml
[INFO]           [ jar ]
[INFO]
[INFO] --- clean:3.2.0:clean (default-clean) @ pgm4 ---
[INFO] Deleting C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4\target
[INFO]
[INFO] --- resources:3.3.1:resources (default-resources) @ pgm4 ---
[INFO] skip non existing resourceDirectory C:\Users\CMRIT-ISE-L209-009\Desktop\IS147\pgm4\src\main\resources
[INFO]
[INFO] --- compiler:3.1.0:compile (default-compile) @ pgm4 ---
[INFO] recompiling the module because of changed source code.

```

Download Copy View as plain text

PROGRAM7: Configuration Management with Ansible: Basics of Ansible: Inventory, Playbooks, and Modules, Automating Server Configurations with Playbooks, Hands-On: Writing and Running a Basic Playbook.

How Do I Install Ansible on Ubuntu?

Installing Ansible on Ubuntu requires setting up an Ansible control node and connecting it to one or more Ansible hosts. The following steps describe how to perform the necessary configuration and test the new Ansible installation.

STEP 1: Configure Ansible Control Node

The Ansible control node is a system used to connect to and manage Ansible host servers. Proceed with the steps below to set up the control node on the main server:

- 1. Create an administrator-level user for the control node. Use the adduser command:**

sudo adduser [username]

- 2. When prompted, define a strong account password.**

```
marko@phoenixnap:~$ sudo adduser ansible
[sudo] password for marko:
Adding user `ansible' ...
Adding new group `ansible' (1001) ...
Adding new user `ansible' (1001) with group `ansible' ...
Creating home directory `/home/ansible' ...
Copying files from `/etc/skel' ...
New password: ←
Retype new password:
passwd: password updated successfully
Changing the user information for ansible
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
marko@phoenixnap:~$ █
```

Optionally, provide more details about the user by answering questions. Press Enter to skip a question.

3. Use the following usermod command to assign superuser privileges to the account:

sudo usermod -aG sudo [username]

A membership in the sudo group allows the user to utilize the sudo command to perform administrative tasks.

4. Switch to the newly created user on the control node:

sudo su [username]

Note: The Ansible control node can be a dedicated server, a local machine, or a virtual machine running Ubuntu.

STEP 2: Set up an SSH Key pair

The Ansible control node uses SSH to connect to hosts. Generate an SSH key pair for the Ansible user by executing the following steps:

1. Enter the command below using the Ansible control node command line:

ssh-keygen

Note: If an SSH key pair with the same name already exists, SSH displays a warning asking the user to decide whether to overwrite it. Overwriting makes the previous SSH key pair unusable, so ensure the old keys are no longer needed before confirming.

2. When prompted, provide a passphrase. While adding a strong passphrase is recommended, pressing Enter allows the user to skip the passphrase creation.

The system generates the public/private key pair and prints the randomart image.

```
ansible@phoenixnap:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ansible/.ssh/id_rsa):
Created directory '/home/ansible/.ssh'.
Enter passphrase (empty for no passphrase): ←
Enter same passphrase again:
Your identification has been saved in /home/ansible/.ssh/id_rsa
Your public key has been saved in /home/ansible/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:89D+0mk6VsCbHevu/kLKOoiWrrvnjsW+Lsgt3jCdRrE ansible@phoenixnap
The key's randomart image is:
+---[RSA 3072]---+
|                               |
|                               |
|                               |
|                               |
| . . . |
| o .o . |
| E S . = o |
| o o Boo+ |
| .oo+ * =+o.. |
| +=o*. ++=o . |
| ...*XBo.0*.o |
+---[SHA256]---+
ansible@phoenixnap:~$
```

STEP 3: Configure an Ansible Host

Ansible hosts are remote servers managed by the Ansible control node. Each host must have the control node's SSH public key into authorized_keys directory. Apply the steps below for each new Ansible host:

1. Use the following ssh-copy-id command on the control node to copy the public key to a host:

ssh-copy-id [username]@[remote-host]

Replace [username] with an existing administrative user on the host system and [remote-host] with the remote host domain or IP address. For example, to copy the key to the user ansible on the host with the local IP address 192.168.0.81, type:

To know IP type command**cat /etc/resolv.conf or hostname -i****ssh ansible@192.168.0.81**

2. Type yes and hit Enter when asked whether to continue connecting to an authenticated host.

3. Enter the remote host account password.

```
ansible@phoenixnap:~$ ssh-copy-id ansible@192.168.0.81
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ansible/.ssh/id_rsa.pub"
The authenticity of host '192.168.0.81 (192.168.0.81)' can't be established.
ED25519 key fingerprint is SHA256:fG67eTA0FjkEJlRAcQyxna/MDc7zX4f0dABzt+aktGM.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
ansible@192.168.0.81's password: ←
Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'ansible@192.168.0.81'"
and check to make sure that only the key(s) you wanted were added.

ansible@phoenixnap:~$
```

The utility uploads the public key to the remote host account.

STEP4 : Install Ansible

Use the APT package manager to install the Ansible package on the control node system:

1. Ensure the package index is up to date

sudo apt update

2. Install Ansible on Ubuntu with the following command:

sudo apt install ansible -y

STEP 5: Verify the Installation

Check that Ansible was successfully installed on your Ubuntu system using the **ansible** command:

ansible --version

The output displays the Ansible version number, the location of the configuration file, the path to the executable, and other information.

```
ansible@phoenixnap:~$ ansible --version
ansible 2.10.8 ←
  config file = /home/ansible/ansible.cfg
  configured module search path = ['/home/ansible/.ansible/plugins/modules', '/usr/share
/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0]
ansible@phoenixnap:~$
```

STEP 6: Set up the Inventory File

Once Ansible is installed on the control node, set up an inventory file to allow Ansible to communicate with remote hosts. The inventory file contains all the information about the remote hosts managed through the Ansible control node.

Note: For an in-depth overview of creating files on remote hosts, refer to our article [How to Create a File In Ansible](#).

Follow the steps below to create an inventory file on the control node:

1. Create the ansible subdirectory in the etc directory:

sudo mkdir -p /etc/ansible

2. Use a text editor such as Nano to create a file named hosts:**`sudo nano /etc/ansible/hosts`****3. Add localhost that the control node will manage. Use the following format:****`[local]`
`localhost ansible_connection=local`**

The [local] line allows for the creation of categories to organize local hosts. The following example adds a local host using its local IP address 127.0.0.1 and sorts it into the servers category:

```
ansible@DESKTOP-VL3E6GS: /home/abhijith
GNU nano 7.2
[local]
localhost ansible_connection=local
```

4. Save the file and exit.**5. Enter the command below to check the items in the inventory:****`ansible-inventory --list -y`**

The output lists the hosts:

```
ansible@DESKTOP-VL3E6GS: /home/abhijith$ ansible-inventory --list -y
all:
  children:
    local:
      hosts:
        localhost:
          ansible_connection: local
ansible@DESKTOP-VL3E6GS: /home/abhijith$
```

STEP 7: Test the Connection

To ensure the Ansible control node can connect to the local hosts and run commands, use the following ansible command to ping the hosts from the control node:

sudo ansible all -m ping

Note: When a user connects to the remote hosts for the first time, Ansible asks for confirmation that the hosts are authentic. To confirm the authenticity, enter yes when prompted.

The output confirms the successful connection.

```
ansible@DESKTOP-VL3E6GS:/home/abhijith$ sudo ansible all -m ping
localhost | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
ansible@DESKTOP-VL3E6GS:/home/abhijith$
```

The Ansible control node is now set up to control the connected remote hosts.

Conclusion

After following the steps in this guide, you have successfully installed Ansible on Ubuntu and can execute commands and playbooks on remote hosts. The guide provided instructions for setting up the Ansible control node and connecting it with the hosts via SSH.

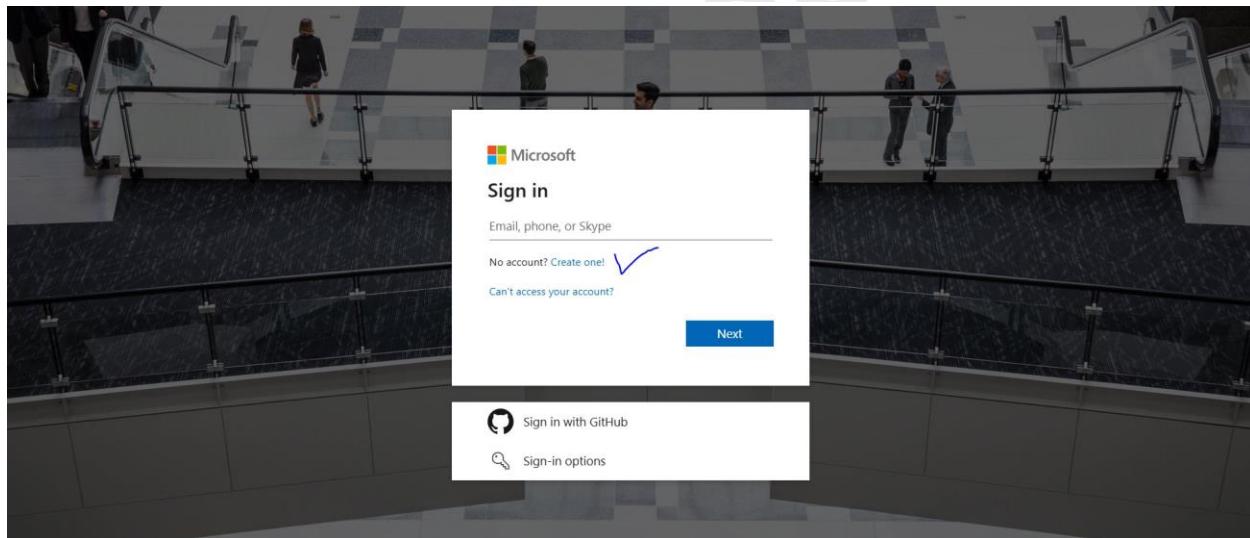
PROGRAM9:Introduction to Azure DevOps: Overview of Azure DevOps Services, Setting Up an Azure DevOps Account and Project.

STEP1: Go to Google chrome and type azure for students

<https://azure.microsoft.com/en-us/free/students>

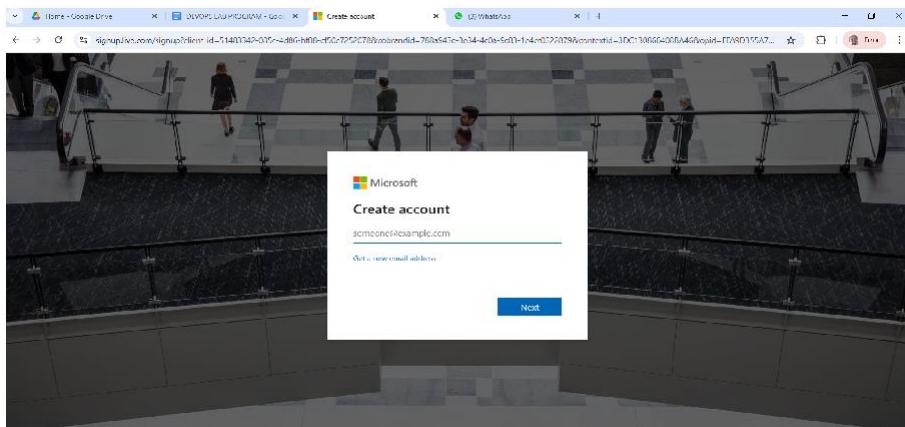
Google search results for "azure for students". The top result is a Microsoft Azure page titled "Azure for Students – Free Account Credit". The page describes getting a \$100 credit for creating a free account with no credit card needed and 12 months of free Azure services. Below it is another Microsoft Azure page titled "Azure for College Students—Offer Details", which states that college students enrolled full time are eligible for a free account with \$100 in credits.

STEP2: Click on Start Free after that u get screen as in below

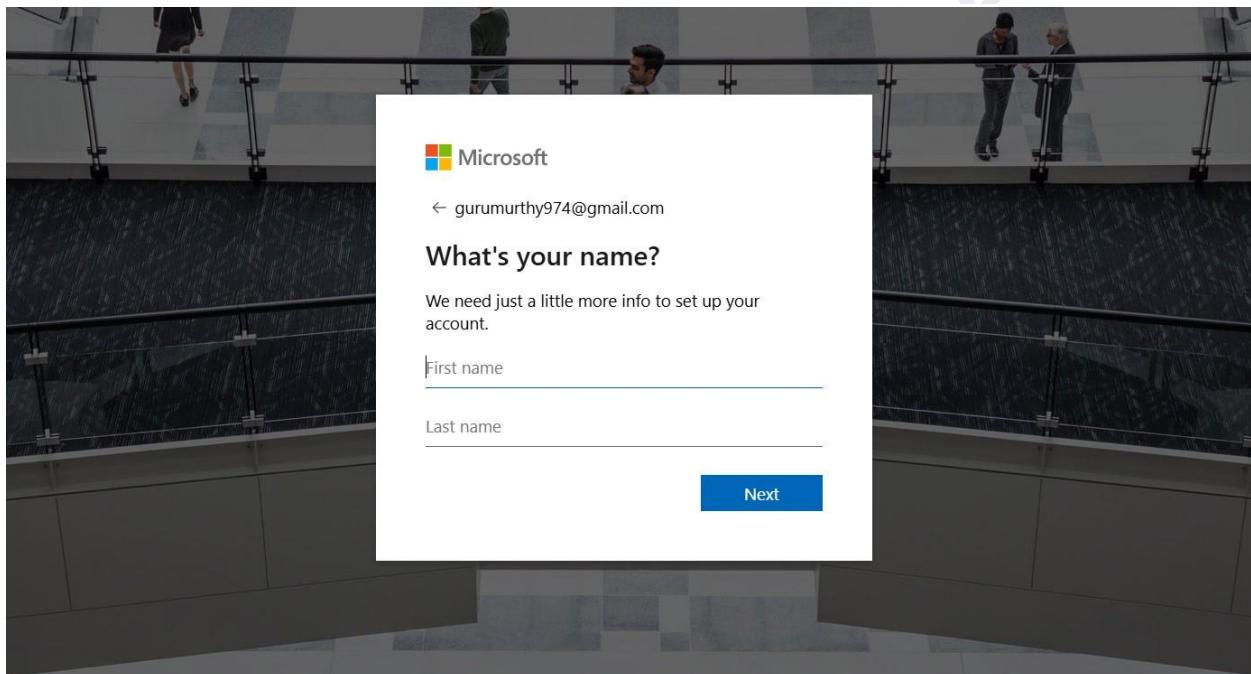


Click on Create one, If u have Github account u can Sign in using github account better way is to create one account

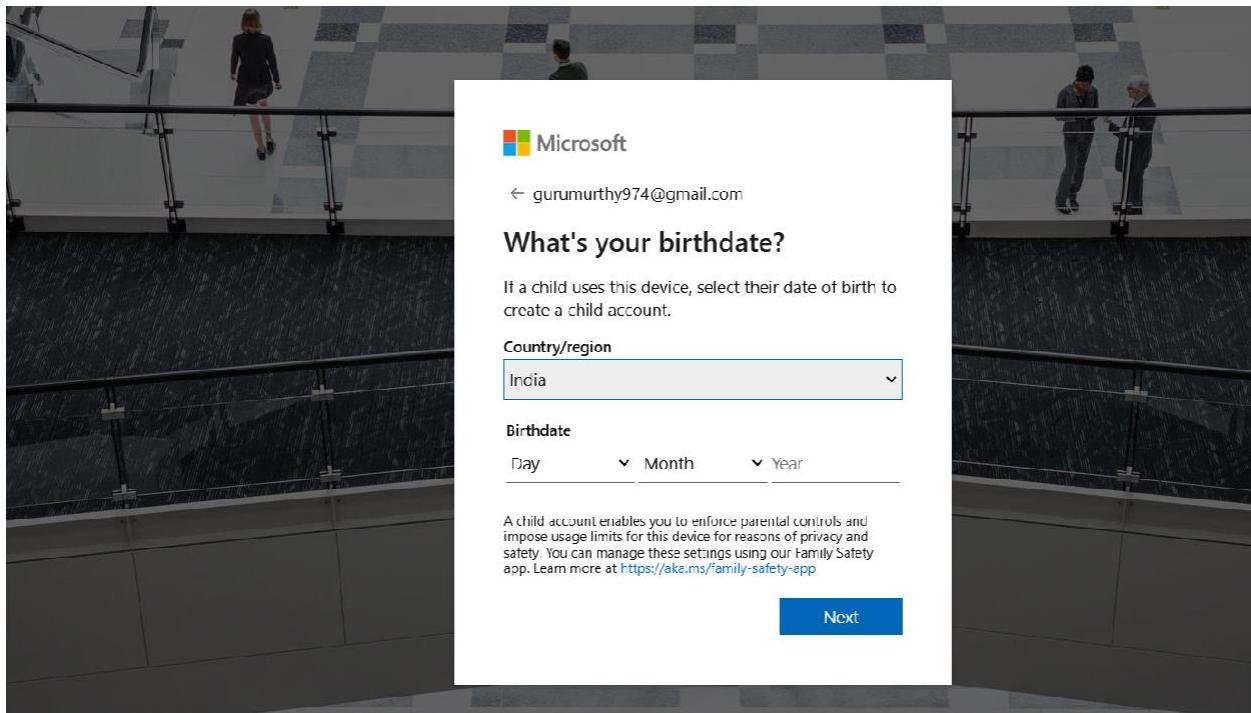
STEP3: Provide your email id at place of create account



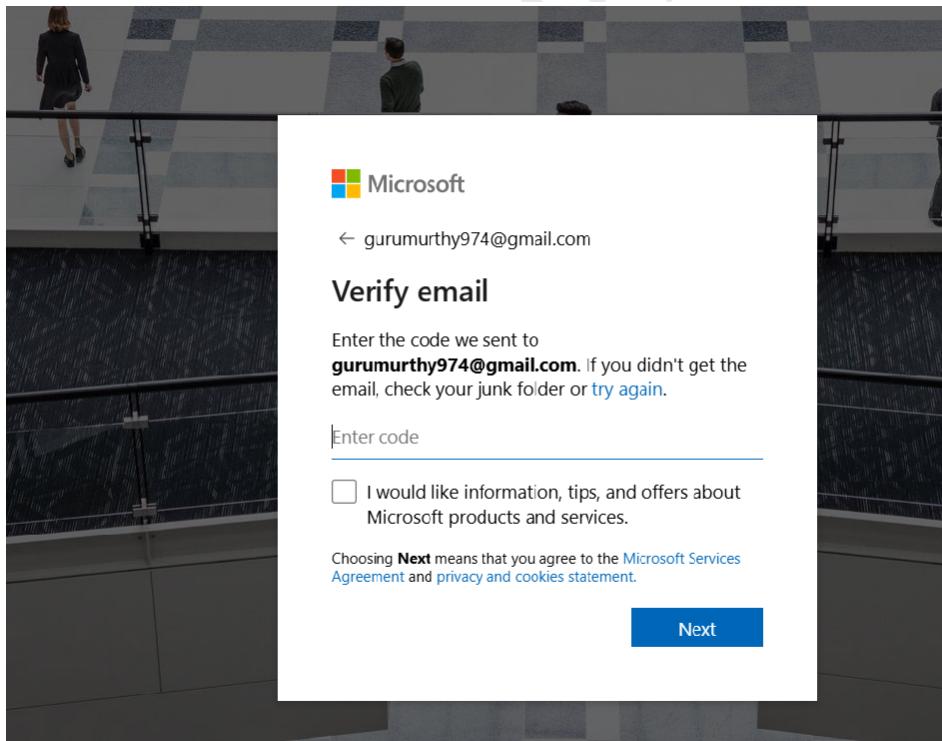
STEP4:After password is set provide your First name Last name



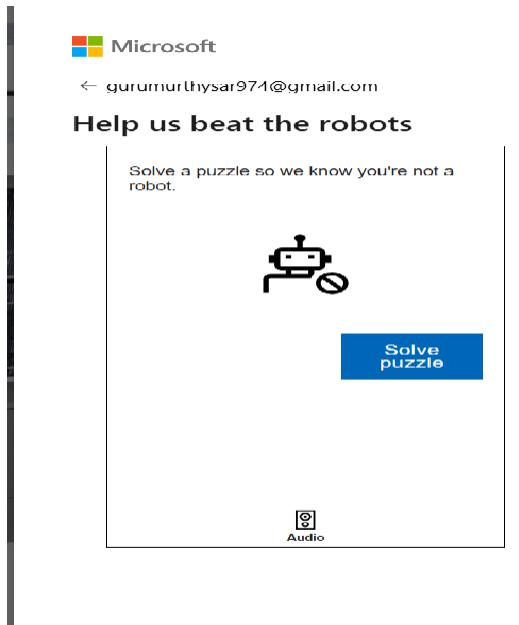
Then provide Country,Date of Birth



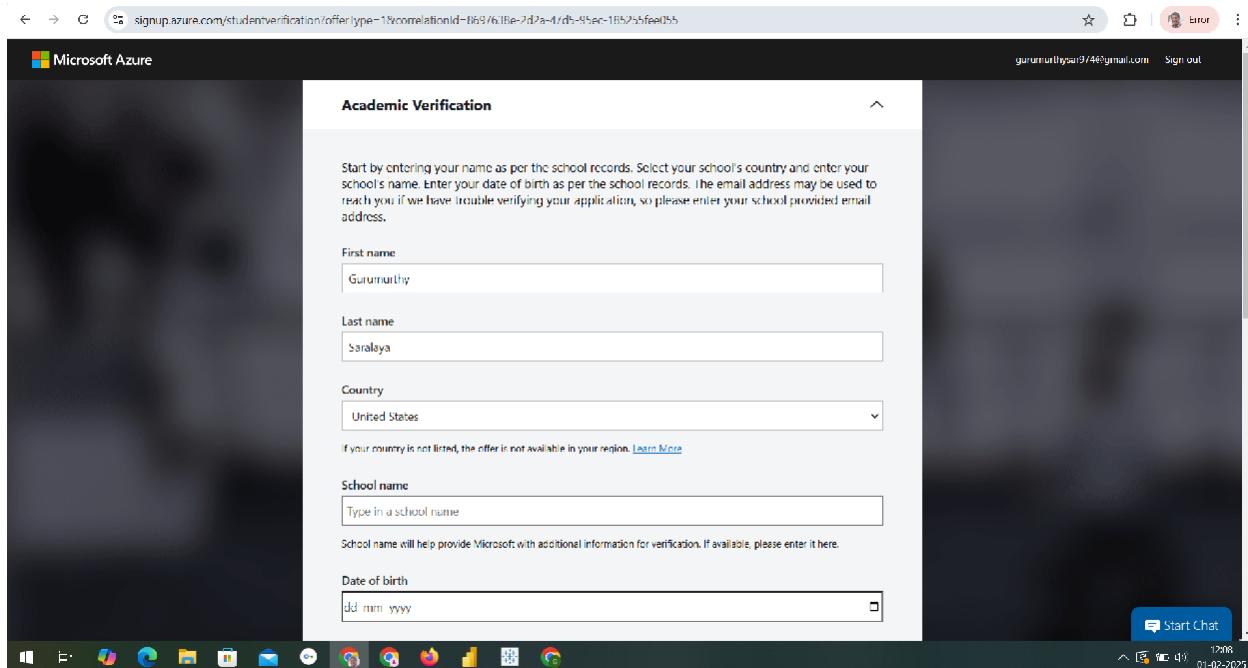
STEP5: Verification code be mailed to the mentioned once kindly type it



**STEP6:After code is verified as u got in the mail referred
U be given an option to solve puzzlegame**



STEP7:This step is the important once where u fill your Academic Details properly where u provide College email id as in provided by your Individual colleges later the verification code again comes



After proper college email is given u get verification mail with link to mail u have provided

Hello,

You have received this email because you recently requested verification via **Microsoft's Academic Verification** service. If you did not submit your email for this program, please disregard this email.

To complete your academic status verification, please click the link below. The link will automatically expire if not used within 5 days.

After clicking the link, your verification status will be confirmed and you will return to the site.

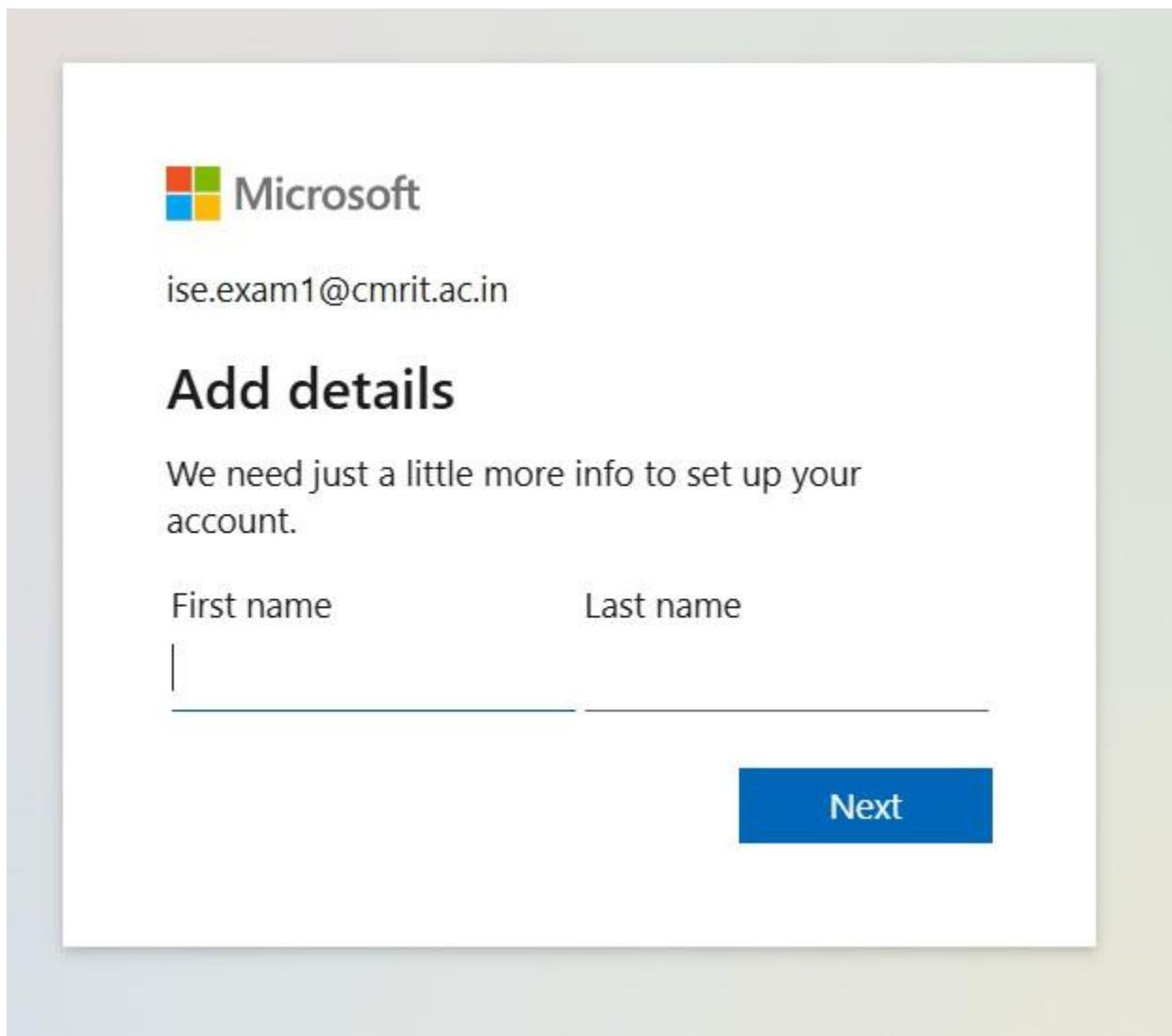
-Navigate to: <https://verifyemail.microsoft.com/v1.0/tokenverification/verify?signature=YPQIdNoTloPJ8nJy8QXZhbyR5Y5wAfvkVaNghX5hgX6Yb0hOyqw5Aa5CsLqDGTWbHGIFSKjx37ROJFB7B0BoqKqDTcsJ3ADCIXL9McGPZs97Ms2qbP54fx0AGGTgdu7Y2SGVdpLBk98PiP33rVZf%2F2ES3z4lR8zM%2BjjuRvGxNuTK%2B4IM2tFKm2kSsbp%2Bi754BLIZSJW4216NcWohhks8i%2Fd2qk7fgLurMrUhi8MaiPwQjLzyBmWbd9bjRY4PtX%2FfhwpOZTPGdROYFUpjyUf6vwYojSylbfBATxAj1se5jlzzsAl2qdHWV03x8Yhm3giN4TGYdxzizDlE0CCGn6h&GVjyls%2BQEIO96N0Rvgj%2FnIccNbsdcmtAN0u9ivHcdpoHRnwX22Q58JgggCzyefDnDbFgxuiteaHQn%2BPkgKnOs260HSdeVVEc%2B0MBsBAQjBTfiHeL7XEkYdahHXReTh8a77XxbRAQAdXGXIwfW0caHpUHafaNKxiQBM28dR%2BPgZB0n3kKFMiR20ltYQtxpSkOGa6DOssh38bumS2WrSQ%3D>

Thank You,

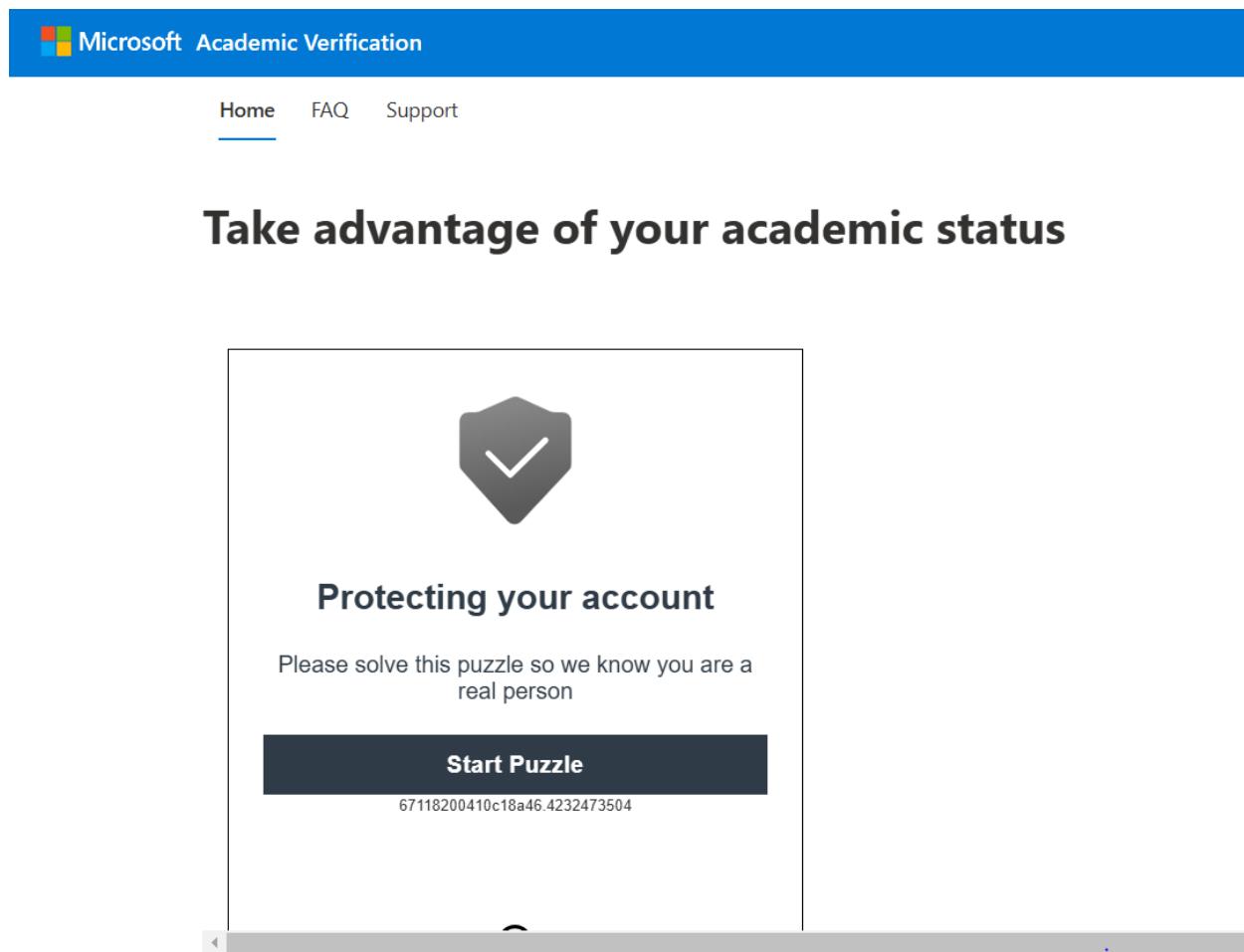
The **Microsoft Academic Verification Team**

Click on link sent

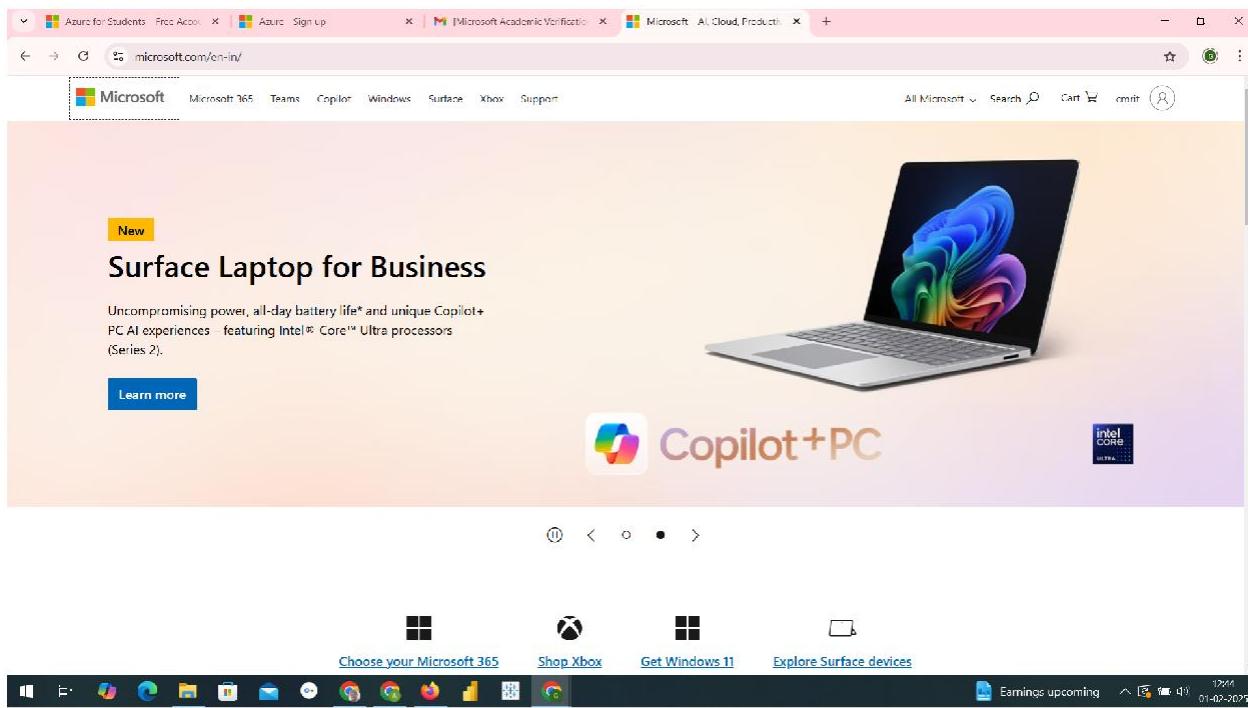
After u Click The screen be as in Below



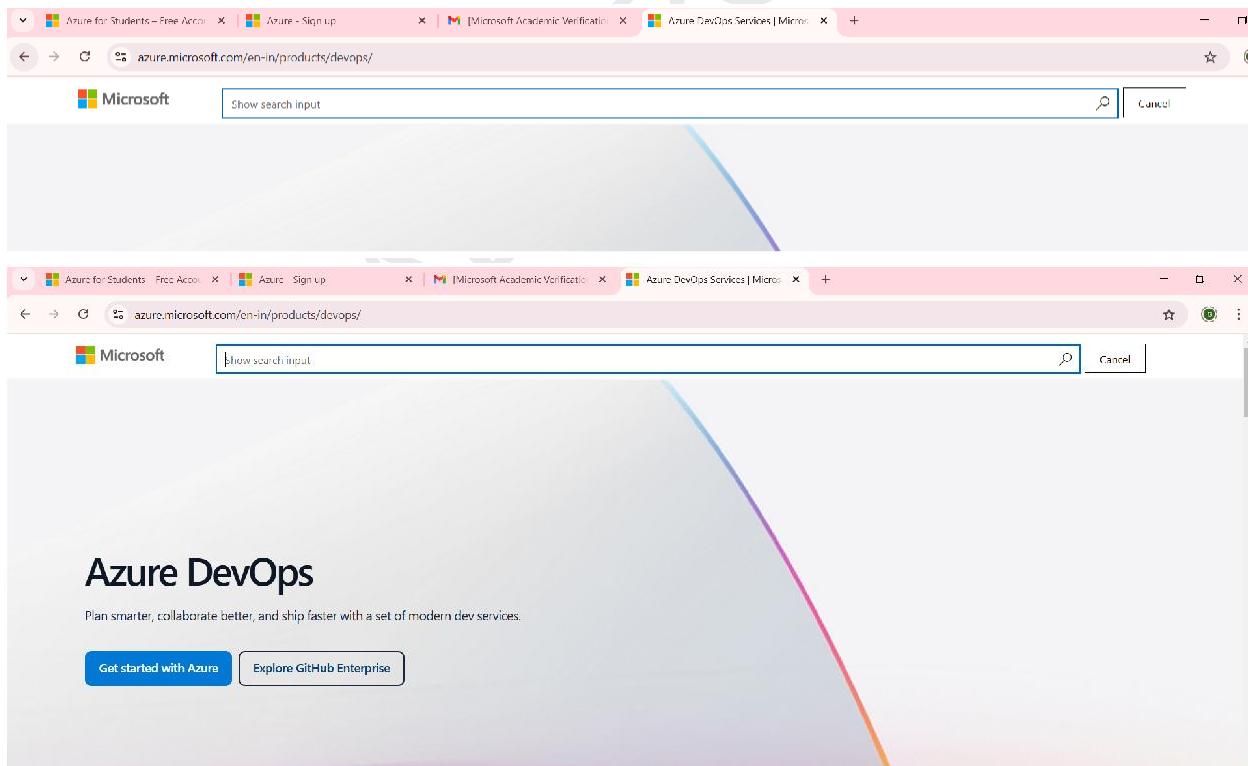
TO MAKE UR ACCOUNT SECURE IT AGAIN HAVE PUZZLE



Finally ur screen be like this



Go To search and type Azure Devops



Click on Get started with Azure

After the click u get the screen of Get free need not to do anything just click on Signin You will get screen as in below

Welcome to Azure!

Don't have a subscription? Check out the following options.

Start with an Azure free trial

Get \$200 free credit toward Azure products and services, plus 12 months of popular [free services](#).

[Start](#)

Manage Microsoft Entra ID

Manage access, set smart policies, and enhance security with Microsoft Entra ID.

[View](#) [Learn more](#)

Access student benefits

Get free software, Azure credit, or access Azure Dev Tools for Teaching after you verify your academic status.

[Explore](#) [Learn more](#)

Azure services

[Create a resource](#)
[Quickstart Center](#)
[Azure AI services](#)
[Kubernetes services](#)
[Virtual machines](#)
[App Services](#)
[Storage accounts](#)
[SQL databases](#)
[Azure Cosmos DB](#)
[More services](#)

THIS IS THE HOME PAGE OF THE MICROSOFT AZURE where you can see a number of services now our target is Azure Devops

In top where have search for services

Welcome to Azure!

Don't have a subscription? Check out the following options.

Start with an Azure free trial

Get \$200 free credit toward Azure products and services, plus 12 months of popular [free services](#).

[Start](#)

Manage Microsoft Entra ID

Manage access, set smart policies, and enhance security with Microsoft Entra ID.

[View](#) [Learn more](#)

Access student benefits

Get free software, Azure credit, or access Azure Dev Tools for Teaching after you verify your academic status.

[Explore](#) [Learn more](#)

Azure services

[Create a resource](#)
[Quickstart Center](#)
[Azure AI services](#)
[Kubernetes services](#)
[Virtual machines](#)
[App Services](#)
[Storage accounts](#)
[SQL databases](#)
[Azure Cosmos DB](#)
[More services](#)

Type Azure Devops

STEP8:Select Azure Devops Organization

Welcome to Azure!

Start with an Azure free trial

Azure services

Create a resource Quickstart Center

Services (991)

Resources

See more

student benefits

Learn more

SQL databases Azure Cosmos DB More services

STEP9:

After u opting for Azure Devops Organizations u get a screen as in below now select **My Azure DevOps Organizations**

All services > Azure DevOps ...

We've made it easier to manage Azure DevOps billing and subscriptions. You can set up billing, change your subscription or pay for more users and resources within Azure DevOps. Learn more

Azure DevOps

Plan smarter, collaborate better, and ship faster with a set of modern dev services

My Azure DevOps Organizations

Get started using Azure DevOps Billing management for Azure DevOps

Give feedback

Tell us about your experience with the Azure DevOps page

After above selection it once again reverifies name and email just click **Continue**
After it U get a Screen

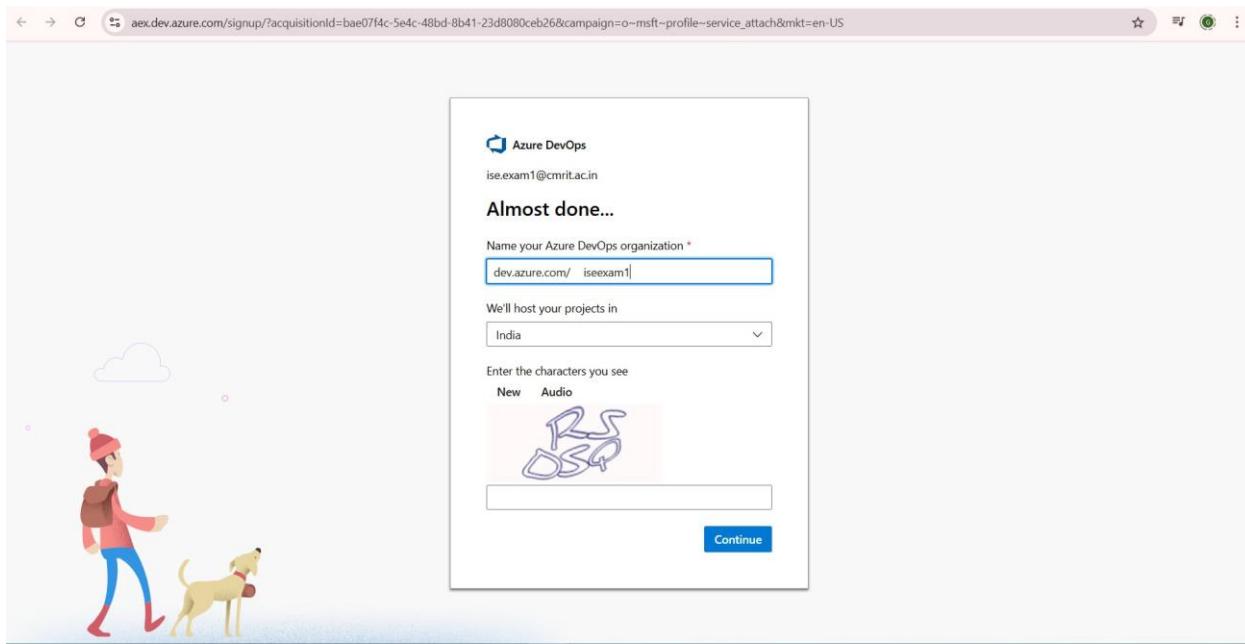


Get started with Azure DevOps

Plan better, code together, ship faster with Azure DevOps

[Create new organization](#)

VTU



You will be able to see Organization is Created

Azure DevOps Organizations

[Create new organization](#)

✓ dev.azure.com/iseexam10557 (Owner)

Create a Team Project and start collaborating with your team now!

New project



Actions

[Open in Visual Studio](#)

Finally After Creating a New Organization

U can create Project of ur choice as per requirement

Every time u need not to signin u can bookmark or add the below link as shortcut

<https://aex.dev.azure.com/>

<https://portal.azure.com/#home>

PROGRAM10: Creating Build Pipelines: Building a Maven/Gradle Project with Azure Pipelines, Integrating Code Repositories (e.g., GitHub, Azure Repos), Running Unit Tests and Generating Reports.

STEP1:On creating organization goto Organization settings goto Policy And Allow Public Projects active

The screenshot shows the Azure DevOps Policies page for the organization 'gurumurthysar974'. The left sidebar is collapsed. The main area displays 'Application connection policies' (Off), 'Security policies' (On, with a blue arrow pointing to the 'Allow public projects' option), and 'User policies' (Off). The 'Allow public projects' option is highlighted with a blue circle and a checkmark. The status bar at the bottom shows the date as 04-02-2025 and the time as 17:39.

STEP2: GOTO GITBASH

TYPE COMMANDS AS IN BELOW

mkdir maventest1

cd maventest1

STEP3: to create simple hellow world maven project type command as in below

mvn archetype:generate -DgroupId=com.dineshonjava -DartifactId=Javateam -DarchetypeArtifactId=maven-archetype-quickstart -DinteractiveMode=false

```

user@DESKTOP-VL3E6GS MINGW64 ~/maventest1 (main)
$ mvn archetype:generate -DgroupId=com.dineshongjava -DartifactId=JavaHelloWorld -DarchetypeArtifactId=maven-archetype-quickstart -DinteractiveMode=false
[INFO] Scanning for projects...
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/3.1.2/maven-install-plugin-3.1.2.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/3.1.2/maven-install-plugin-3.1.2.pom (8.5 kB at 9.8 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/42/maven-plugins-42.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/42/maven-plugins-42.pom (7.7 kB at 60 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/3.1.2/maven-install-plugin-3.1.2.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-deploy-plugin/3.1.2/maven-deploy-plugin-3.1.2.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-deploy-plugin/3.1.2/maven-deploy-plugin-3.1.2.pom (9.6 kB at 171 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-deploy-plugin/3.1.2/maven-deploy-plugin-3.1.2.jar (40 kB at 964 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-assembly-plugin/3.7.1/maven-assembly-plugin-3.7.1.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-assembly-plugin/3.7.1/maven-assembly-plugin-3.7.1.pom (15 kB at 524 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/41/maven-plugins-41.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/41/maven-plugins-41.pom (7.4 kB at 104 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-assembly-plugin/3.7.1/maven-assembly-plugin-3.7.1.jar (240 kB at 1.6 MB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-assembly-plugin/3.7.1/maven-assembly-plugin-3.7.1.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-dependency-plugin/3.7.0/maven-dependency-plugin-3.7.0.pom (19 kB at 301 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-dependency-plugin/3.7.0/maven-dependency-plugin-3.7.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-dependency-plugin/3.7.0/maven-dependency-plugin-3.7.0.jar (207 kB at 4.2 MB/s)
[INFO]
[INFO] -----> org.apache.maven:standalone-pom <-----
[INFO] Building Maven Stub Project (No POM) 1
[INFO] [ pom ]
[INFO]
[INFO] >>> archetype:3.3.1:generate (default-cli) > generate-sources @ standalone-pom >>>
[INFO]
[INFO] <<< archetype:3.3.1:generate (default-cli) < generate-sources @ standalone-pom <<<
[INFO]
[INFO]
[INFO] --- archetype:3.3.1:generate (default-cli) @ standalone-pom ---
[INFO] Generating project in Batch mode
Downloaded From central: https://repo.maven.apache.org/maven2/org/apache/maven/archetypes/maven-archetype-quickstart/1.0/maven-archetype-quickstart-1.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/archetypes/maven-archetype-quickstart/1.0/maven-archetype-quickstart-1.0.jar (4.3 kB at 102 kB/s)
[INFO]
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-archetype-quickstart:1.0
[INFO]
[INFO] Parameter: basedir, Value: C:\Users\User\maventest1
[INFO] Parameter: package, Value: com.dineshongjava
[INFO] Parameter: groupId, Value: com.dineshongjava
[INFO] Parameter: artifactId, Value: JavaHelloWorld
[INFO] Parameter: packageNames, Value: com.dineshongjava
[INFO] Parameter: version, Value: 1.0-SNAPSHOT
[INFO] project created from Old (1.x) Archetype in dir: c:\Users\User\maventest1\JavaHelloWorld
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 5.691 s
[INFO] Finished at: 2025-02-04T17:58:22+05:30
[INFO]
[INFO] -----
```

STEP3: to add files from local to github Follow the procedure

- First create a repository in github as maventestazure
- Then come to gitbash and type

git init
git add .
git commit -m "azure pipeline example"
git branch -M main
git remote add origin <https://github.com/gurumurthy974/maventestazure.git>
git push -u origin main

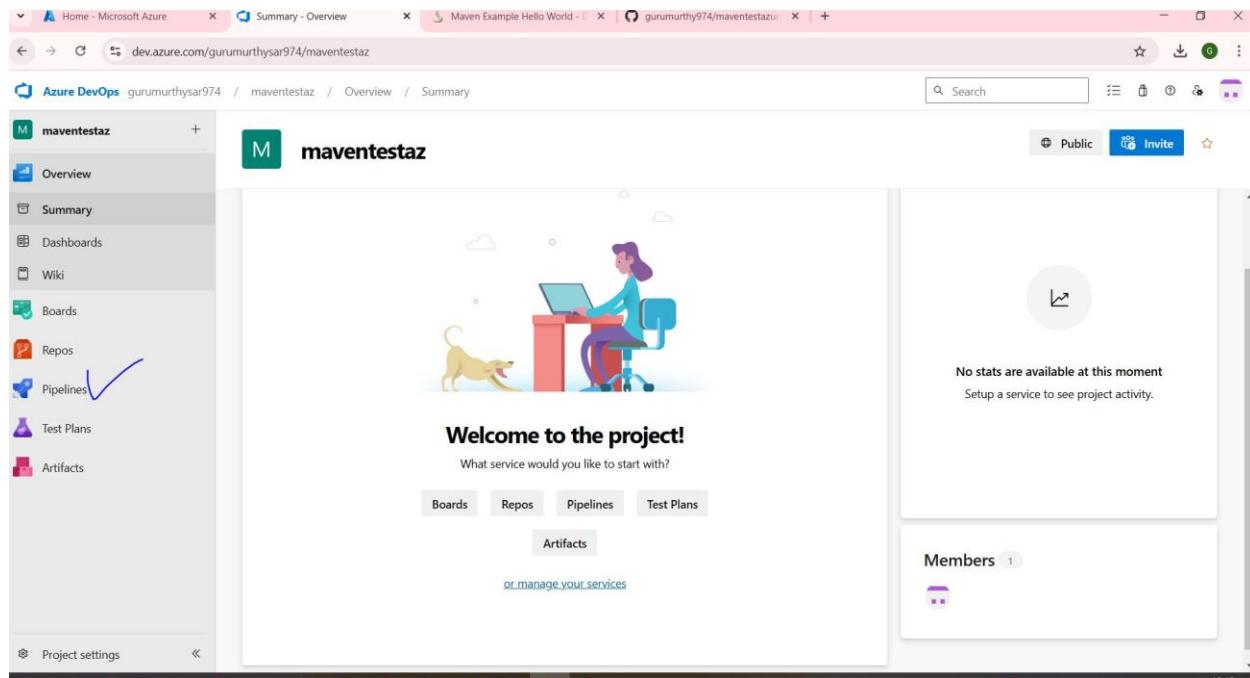
After completion of above command my repository looks

The screenshot shows a GitHub repository page for 'maventestazure'. The repository is public and has one branch ('main') and one commit by 'gurumurthy974' named 'first'. A checkmark is drawn next to the commit message. The README section is visible below the commit history.

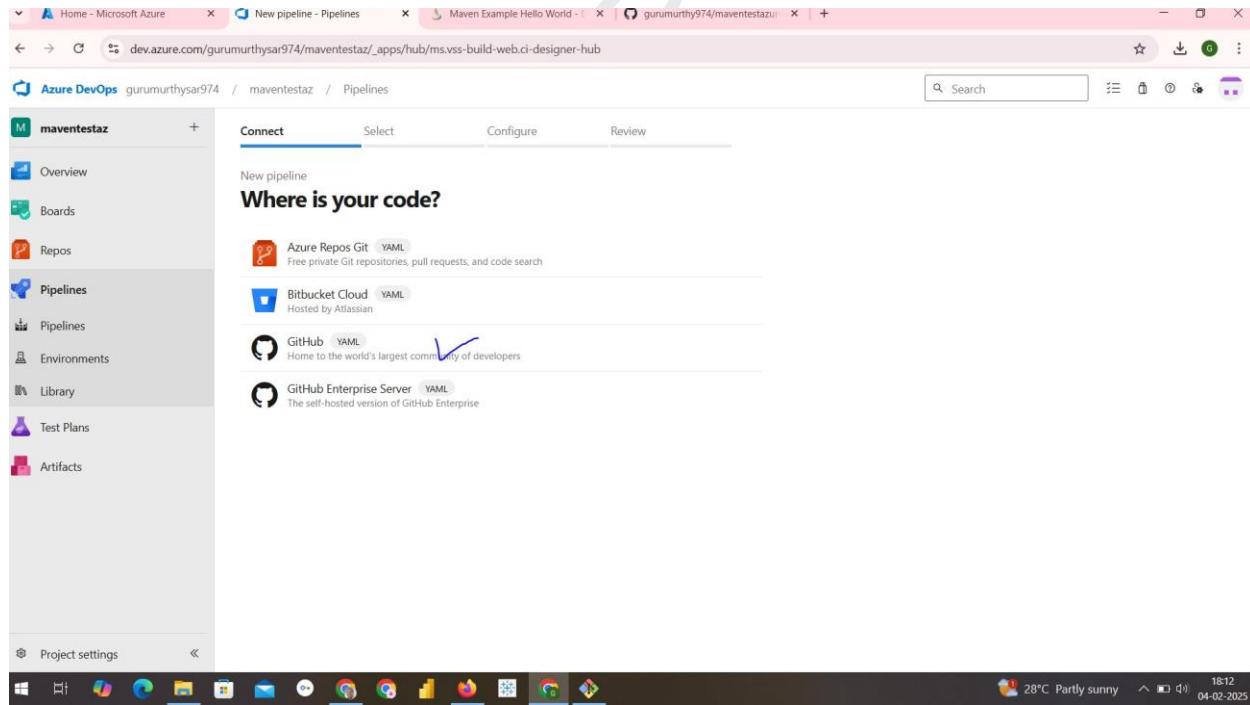
STEP4: Now goto Azure Devops Organization, create a Public Project

The screenshot shows the 'Create a project to get started' page in Azure DevOps. The project name is 'maventestaz', visibility is set to 'Public', and a checkmark is present next to the 'Public' option. The 'Create project' button is at the bottom.

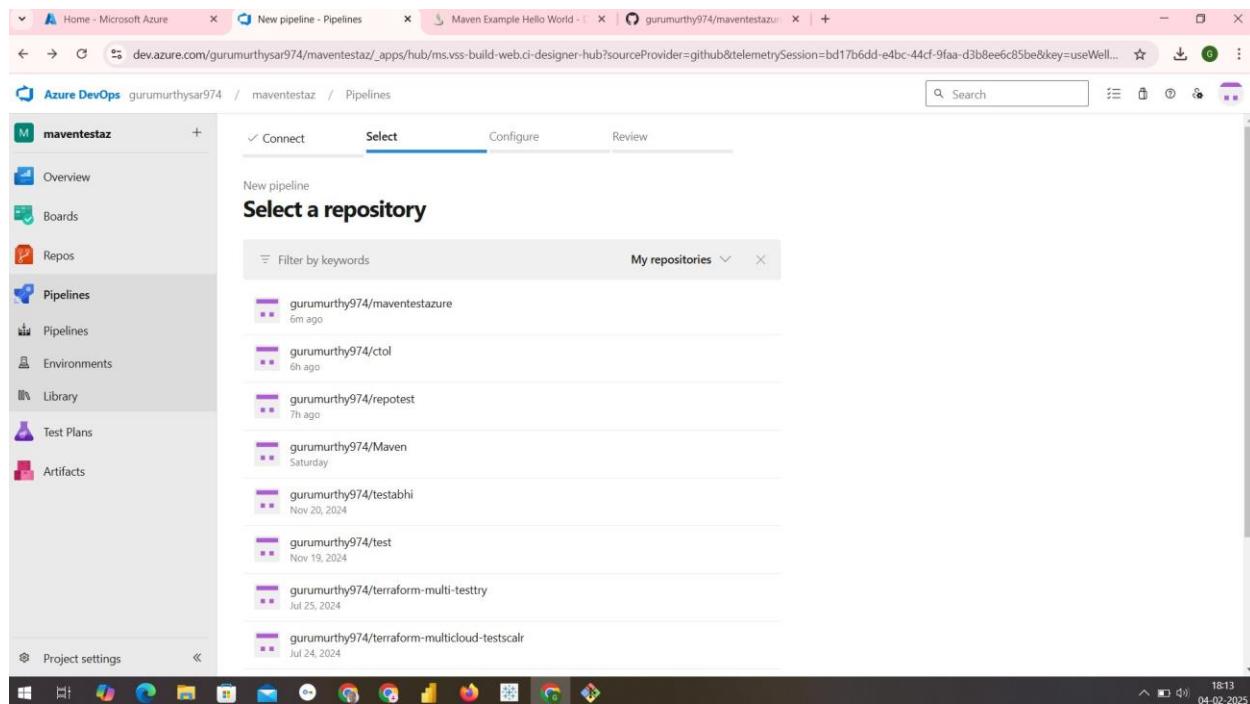
STEP5: SELECT PIPELINE and then click on create pipeline



STEP6: After creating Pipeline select type of repo as Github

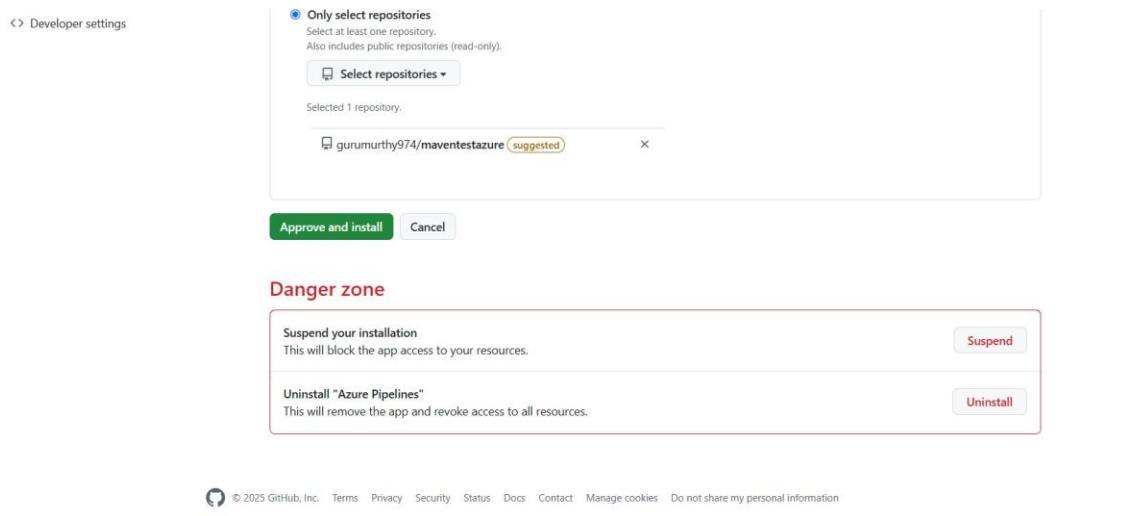


STEP7: It asks for minimum signin verification after that ur screen be as in below select required repository there to run maven project in my case its **maventest123**



STEP8: AFTER REQUIRED REPO IS SELECTED the screen be as in below

Drag the screen down check once again the selected repository is correct or not then click on Approve and Install



STEP9: It again verifies signin verification of microsoft account You be able to see starter pipeline selected for Maven

The screenshot shows the Azure DevOps Pipelines configuration screen for a Maven project named "maventestaz". The left sidebar shows navigation options like Overview, Boards, Repos, Pipelines, Environments, Library, Test Plans, and Artifacts, with "Pipelines" currently selected. The main area is titled "Configure your pipeline" and lists four pipeline creation options: "Maven" (selected, indicated by a checkmark), "Maven package Java project Web App to Linux on Azure", "Starter pipeline", and "Existing Azure Pipelines YAML file". A "Show more" link is at the bottom. The browser address bar shows the URL for the Azure DevOps instance.

After selecting maven it asks for save and run just click on it

The screenshot shows the Azure DevOps interface for creating a new pipeline. The left sidebar is titled 'maventestaz' and includes sections for Overview, Boards, Repos, Pipelines (selected), Environments, Library, Test Plans, and Artifacts. The main area is titled 'Review your pipeline YAML' and displays the following YAML code:

```

1   # Maven
2   # Build your Java project and run tests with Apache Maven.
3   # Add steps that analyze code, save build artifacts, deploy, and more:
4   # https://docs.microsoft.com/azure/devops/pipelines/languages/java
5
6   trigger:
7     - main
8
9   pool:
10    - vmImage: ubuntu-latest
11
12   steps:
13     - task: Maven@3
14       inputs:
15         mavenPomFile: 'pom.xml'
16         mavenOptions: '-Xmx3072m'
17         javaHomeOption: 'JDKVersion'
18         jdkVersionOption: '1.11'
19         jdkArchitectureOption: 'x64'
20         publishJUnitResults: true
21         testResultsFiles: '**/surefire-reports/TEST-*.xml'
22         goals: 'package'
23

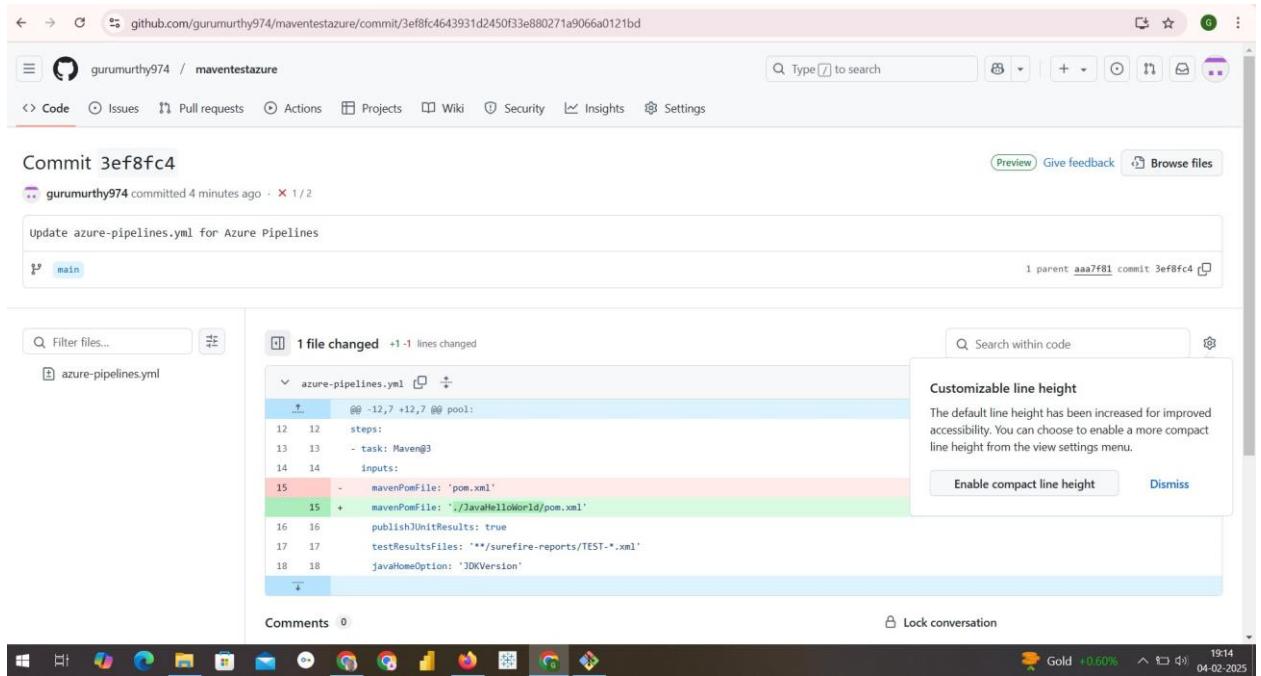
```

At the top right, there are buttons for 'Variables', 'Save and run', and 'Show assistant'. A large blue checkmark icon is overlaid on the right side of the main area.

Finally You be able to see tasks running its failed bec we shld mention proper path For pom.xml

The screenshot shows the 'Summary' tab for a pipeline run. It includes the following details:

- Manually run by:** Gurumurthy Saralaya
- Repository and version:** gurumurthy974/maventestazure, main f6a6b586
- Time started and elapsed:** Just now, 30s
- Related:** 0 work items, 0 artifacts
- Tests and coverage:** Get started
- Errors:** 2, **Warnings:** 2



The commits will also be visible in github

We can download and also see individual Raw Log Reports

```

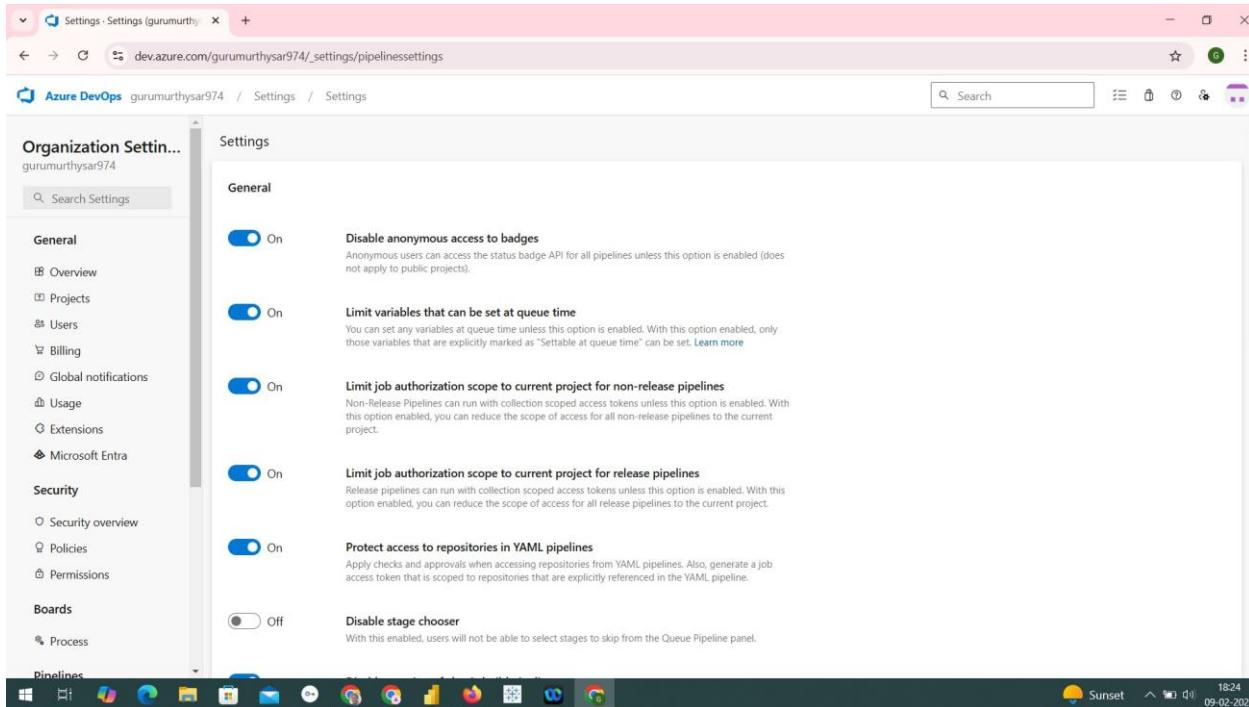
1 Starting: Maven
2 -----
3 Task      : Maven
4 Description : Build, test, and deploy with Apache Maven
5 Version   : 3.249.6
6 Author    : Microsoft Corporation
7 Help      : https://docs.microsoft.com/azure/devops/pipelines/tasks/build/maven
8 -----
9 /usr/bin/mvn -version
10 Apache Maven 3.9.9 (9e8579a9e76f7d015ee5ec7bfcfd97d260186937)
11 Maven home: /usr/share/apache-maven-3.9.9
12 Java version: 21.0.6, vendor: Eclipse Adoptium, runtime: /usr/lib/jvm/tomcat-21-jdk-amd64
13 Default locale: en, platform encoding: UTF-8
14 OS name: "linux", version: "6.5.0-1025-azure", arch: "amd64", family: "unix"
15
16 /usr/bin/mvn -f /home/vsts/work/1/s/JavaHelloWorld/pom.xml package
17 [INFO] Scanning for projects...
18 [INFO]
19 [INFO] -----> com.dineshjavajava:JavaHelloWorld 1.0-SNAPSHOT <-----
20 [INFO] Building JavaHelloWorld 1.0-SNAPSHOT
21 [INFO]   from pom.xml
22 [INFO] -----[ jar ]-----<
23 Downloading From central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-resources-plugin/3.3.1/maven-resources-
24 Progress (1): 1.4/8.2 kB
25 Progress (1): 2.8/8.2 kB
26 Progress (1): 4.1/8.2 kB
27 Progress (1): 5.5/8.2 kB
28 Progress (1): 6.9/8.2 kB
29 Progress (1): 8.2 kB

```

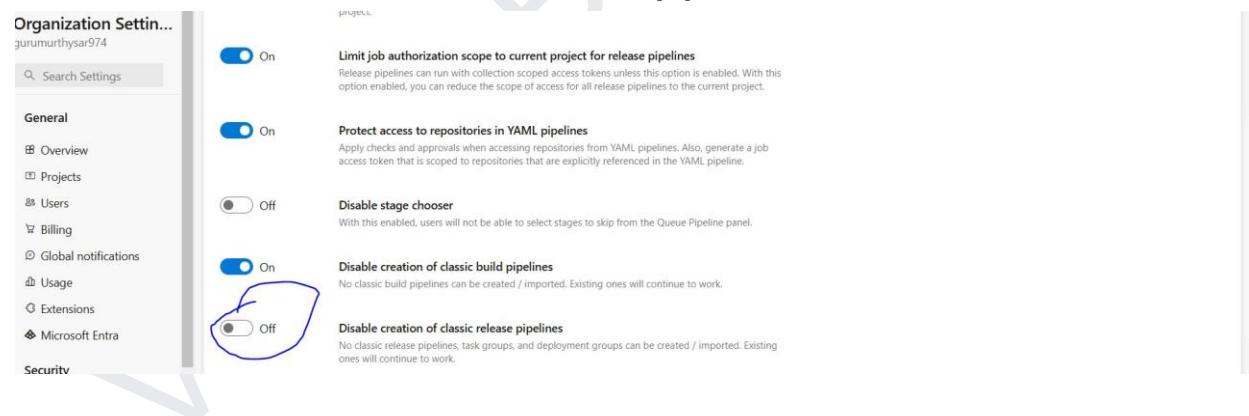
If pipeline permission error comes please complete the registration form of Parallel Jobs after 2 working days(48hrs) u be able to run pipelines for private projects same happens to be for public Projects.

Program11: Creating Release Pipelines: Deploying Applications to Azure App Services, Managing Secrets and Configuration with Azure Key Vault, Hands-On: Continuous Deployment with Azure Pipelines.

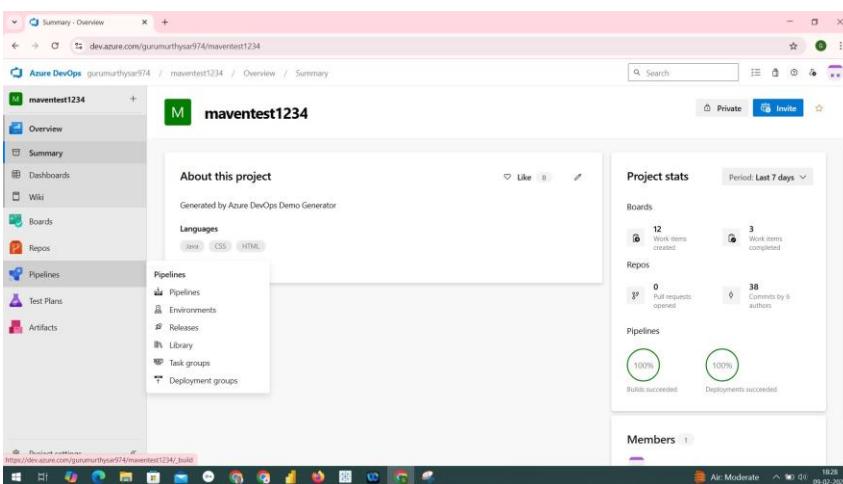
STEP1: Click on Organization setting and click on Pipeline Settings You get screen as in below



STEP2: Off the Disable creation of classic pipeline

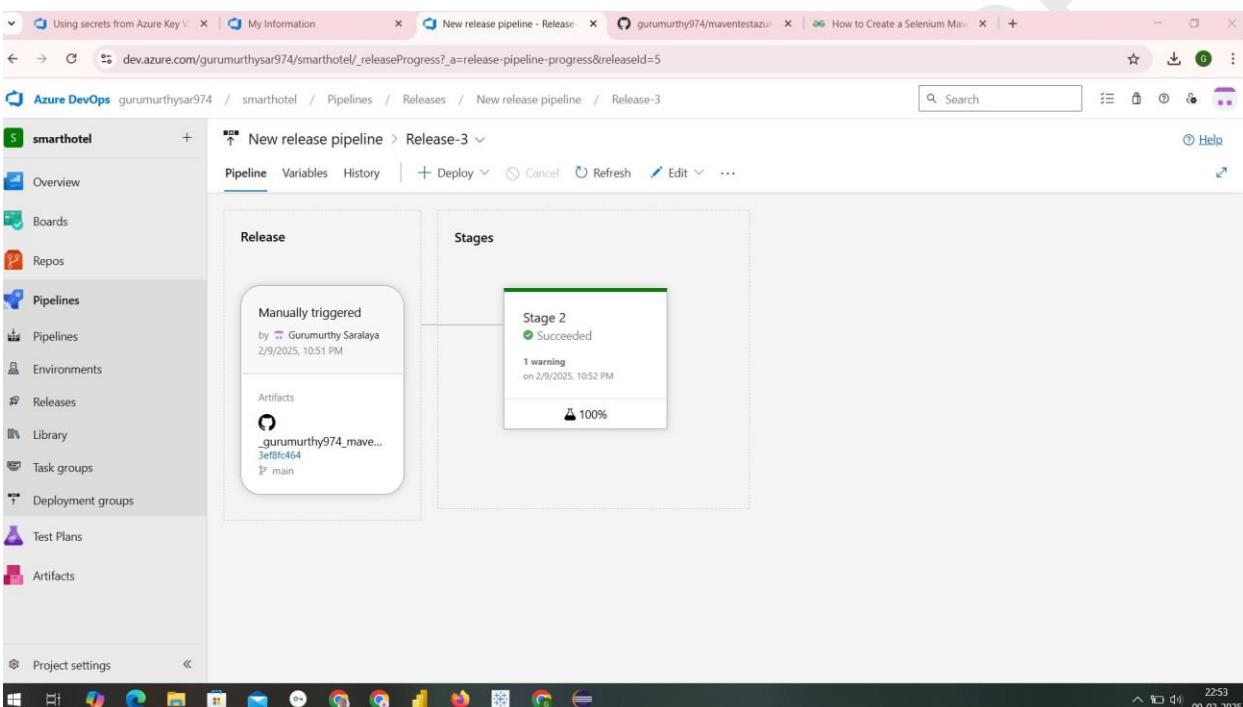
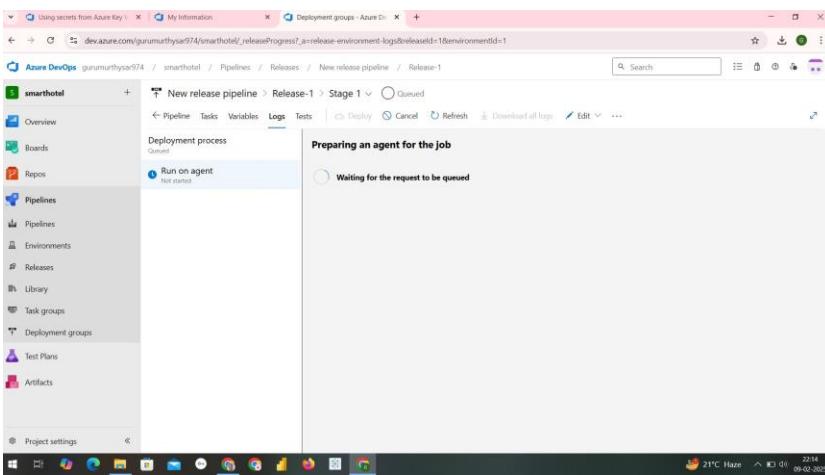


STEP3: Now you be able to see the visibility of Release for any pipeline creation as in screen below.



STEP4: You can run simple test plans

We can build tasks and run them



We can see our Agent Job releases logs

New release pipeline > Release-3 > Stage 2 ✓ Succeeded

← Pipeline Tasks Variables Logs Tests | Deploy Cancel Refresh Download all logs Edit ...

Deployment process succeeded

Agent job Succeeded · 1 warning

Agent job

Pool: Hosted Windows 2019 with ... · Agent: Hosted Agent

Started: 2/9/2025, 10:52:10 PM ... 44s

Initialize job	succeeded	7s
Download Artifacts	succeeded	4s
Maven D:\a\1\gurumurthy974_maventestazure\JavaHelloWorld\pom.xml	succeeded 1 warning	32s
Finalize Job	succeeded	<1s