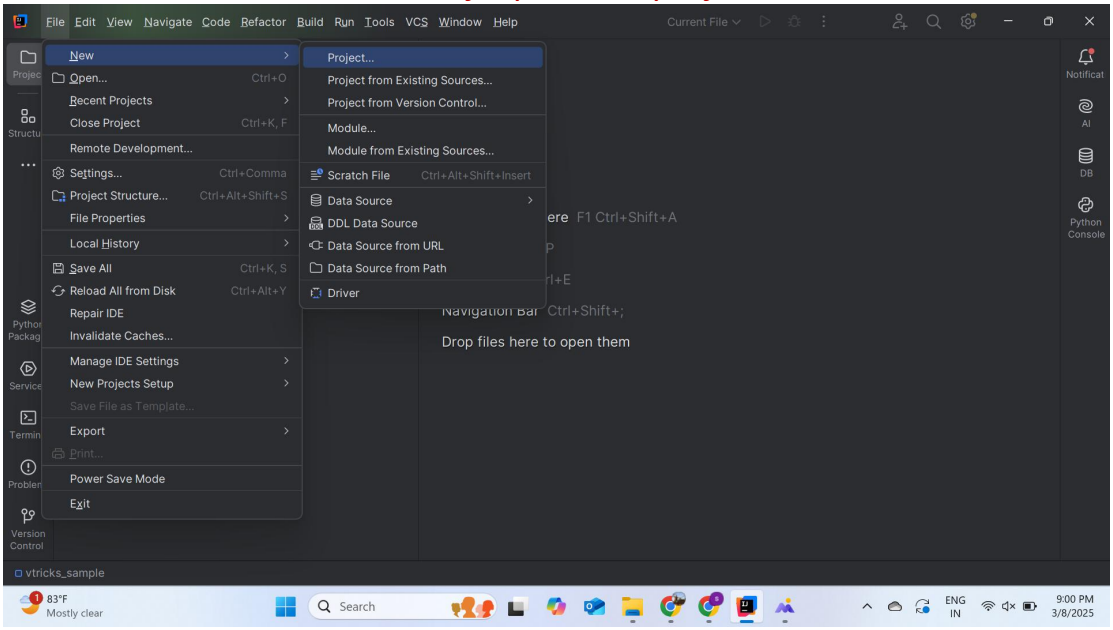
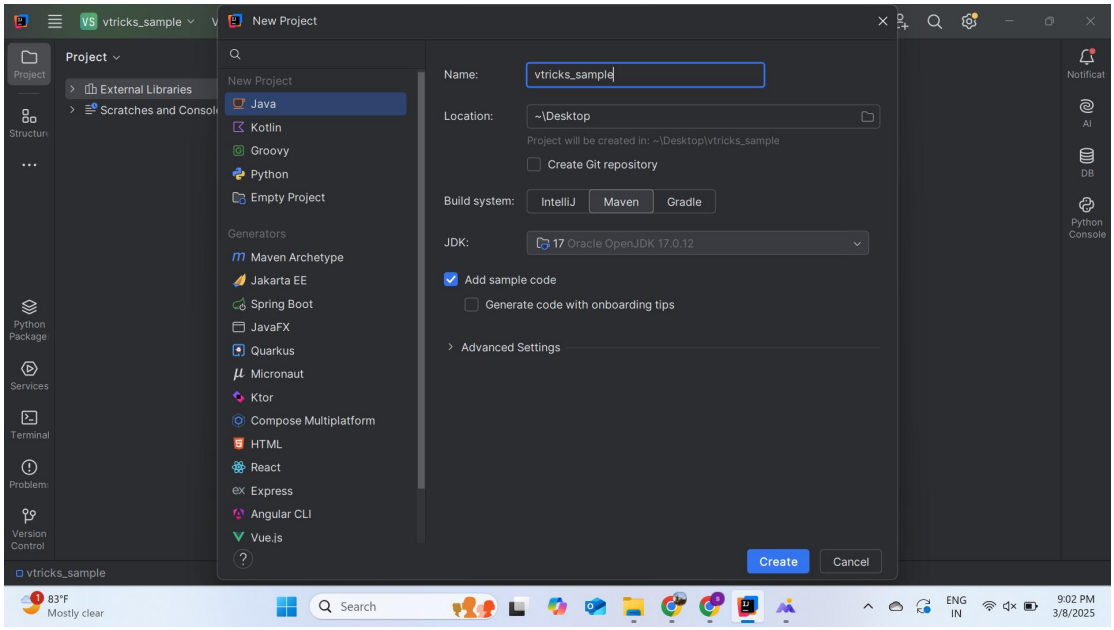
Experiment 10 : Creating Build Pipelines: Building a Maven/Gradle Project with Azure Pipelines, Integrating Code Repositories (e.g., GitHub, Azure Repos), Running Unit Tests and Generating Reports

In intellij, open new project.



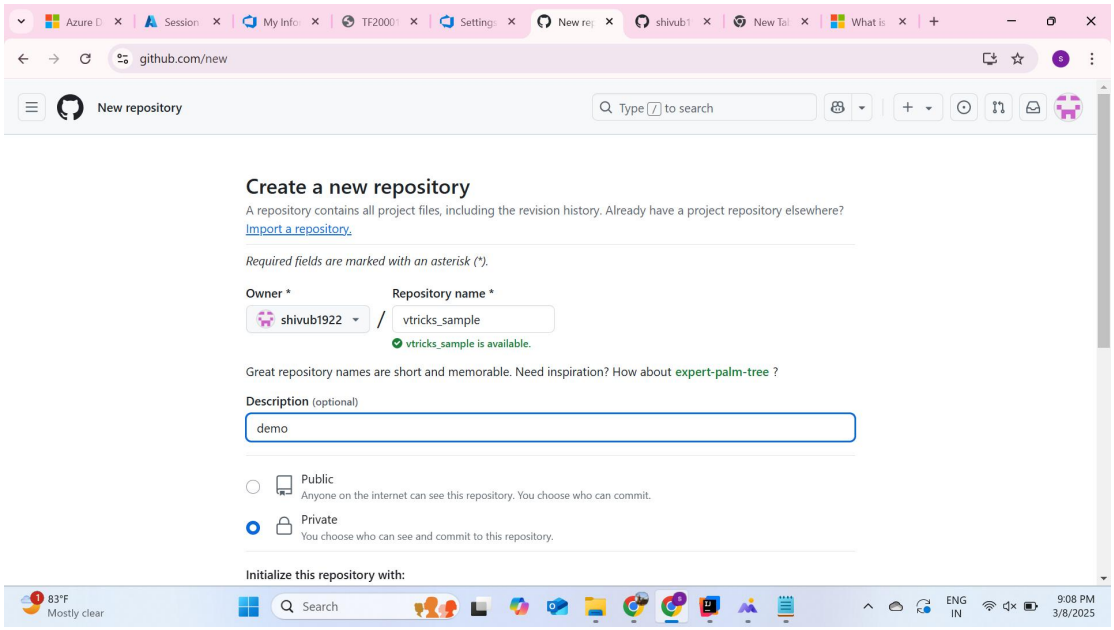
Provide the project name and choose build system as maven



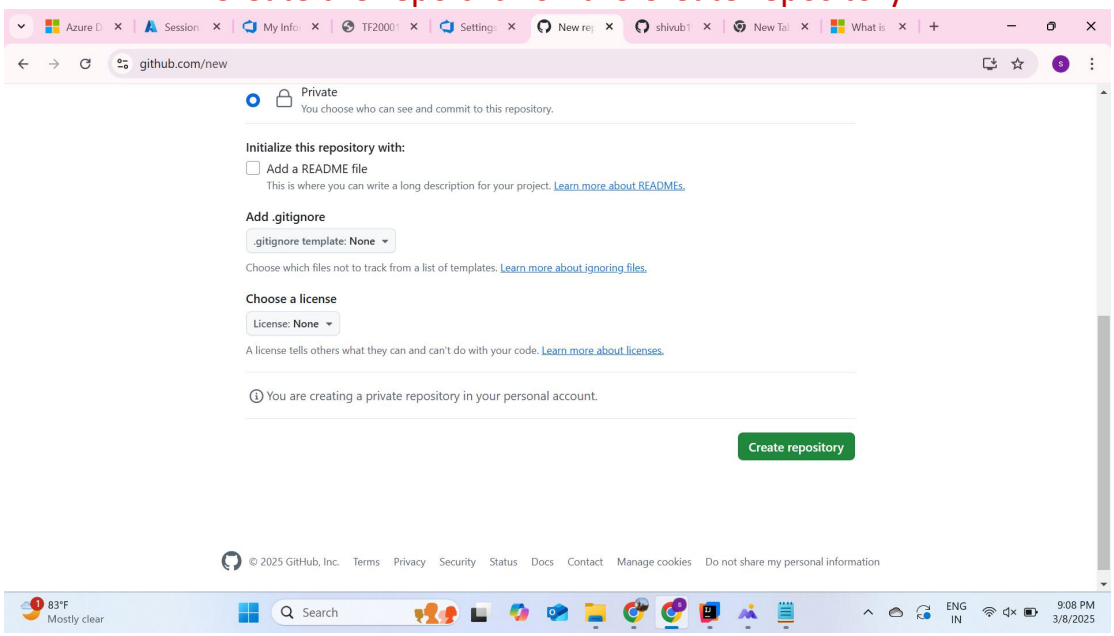
You will be getting a default pom.xm l and main.java file

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/
    <modelVersion>4.0.0</modelVersion>

    <groupId>org.example</groupId>
    <artifactId>vtricks_sample</artifactId>
    <version>1.0-SNAPSHOT</version>

    <properties>
        <maven.compiler.source>23</maven.compiler.source>
        <maven.compiler.target>23</maven.compiler.target>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>
</project>
```

After that create a git repo with the same name as of your project name



Create the repo click on the Create repository



After creating the git repository, you need to give some commands.

git init --to initialize the git

git add . -- add all files to the git

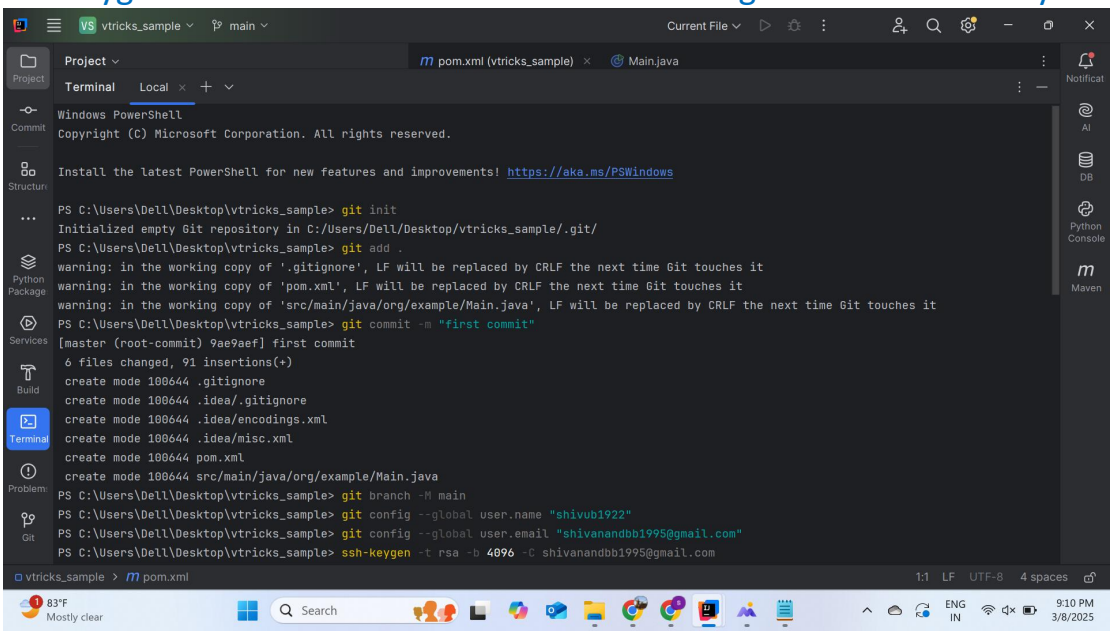
git commit -m “first commit” -- to commit the added files

git branch -M main -- to switchto branch main

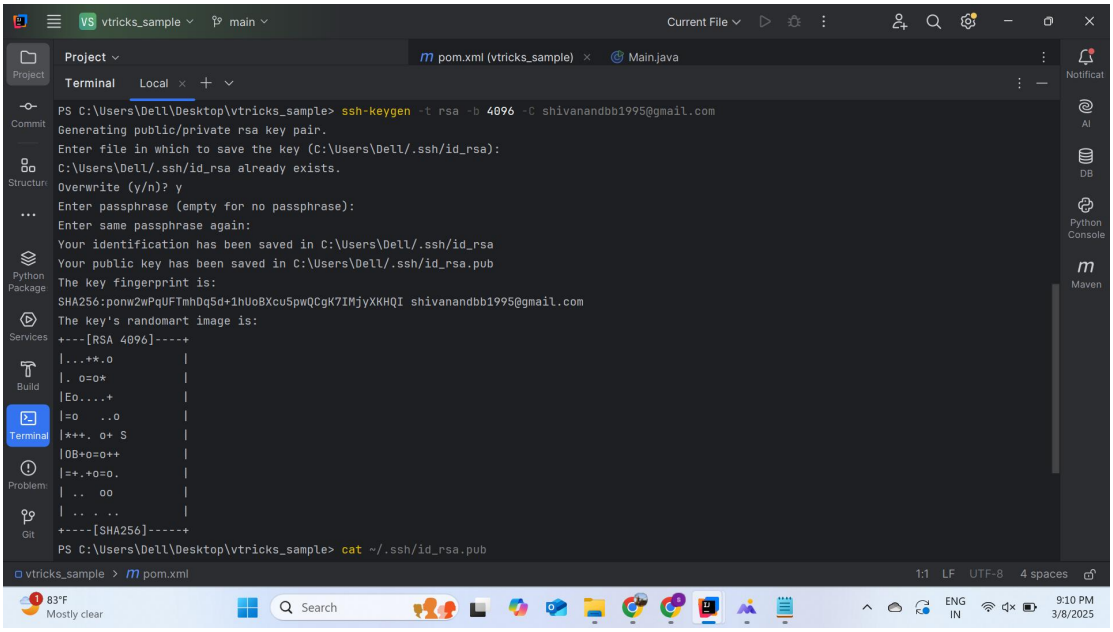
git config --global user.name “username” -- to configure your git account using

git config --global user.email “email-id”

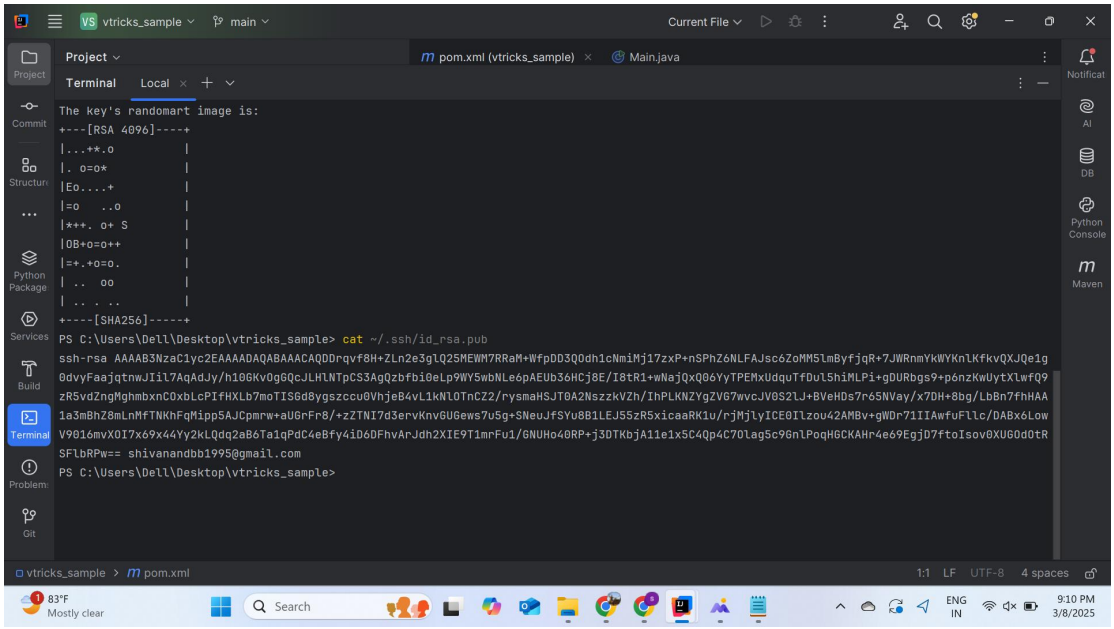
ssh-keygen -t rsa -b 4096 -C <email-id> --to generate the ssh key



press ENTER for all questions

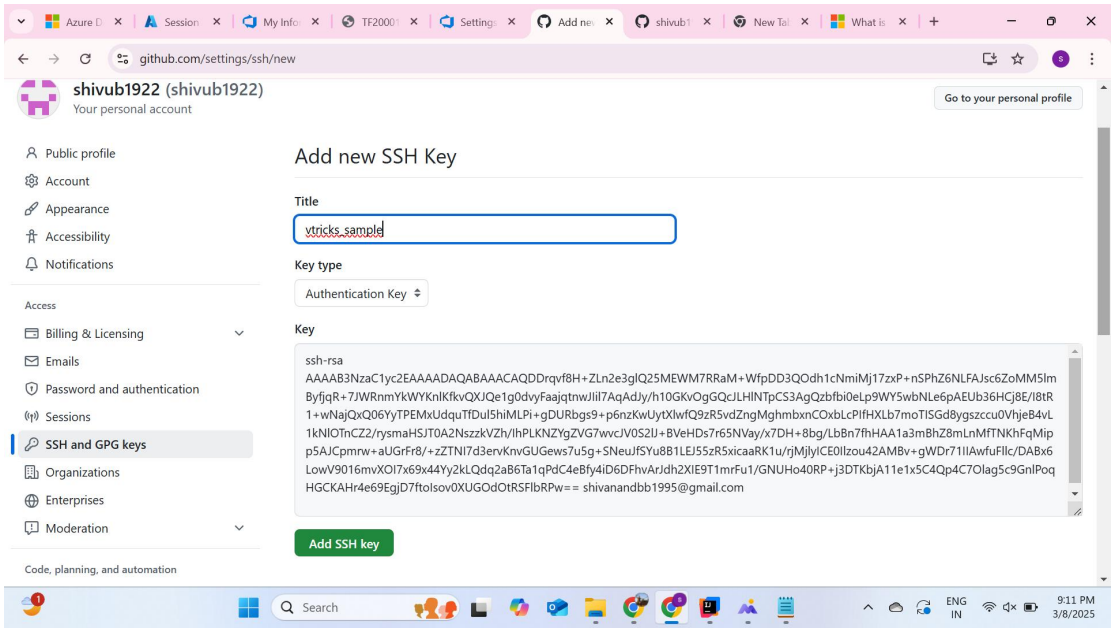


$ cat ~/.ssh/id_rsa.pub (copy the printed SSH key)



1. Now go to the SSH and GPG section in the GitHub settings option.
2. Click on the New SSH key button.

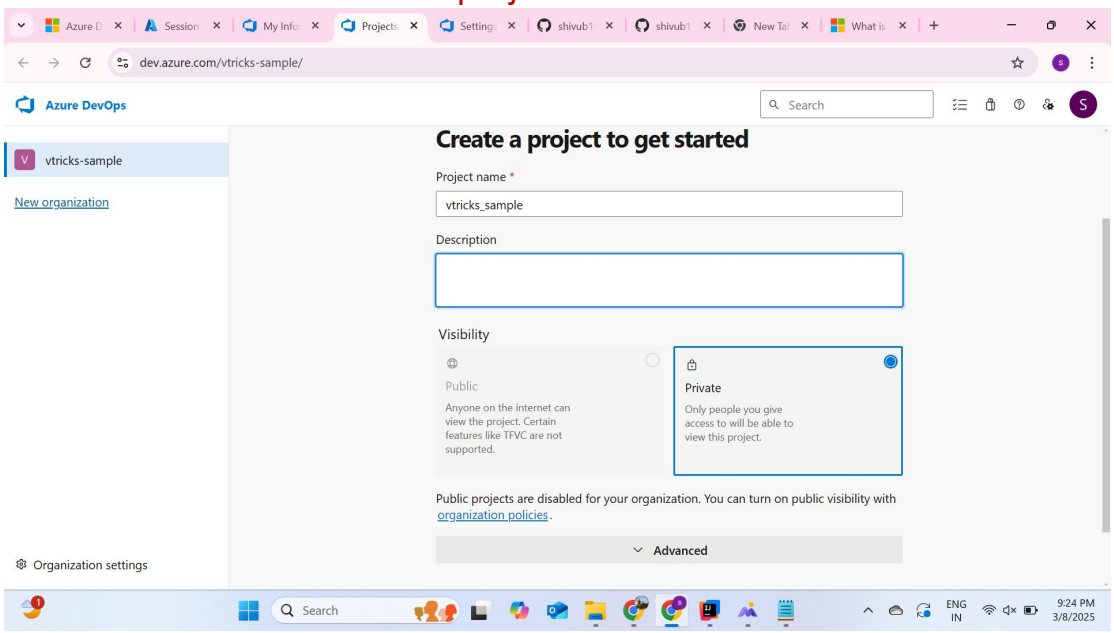
Choose a suitable name and paste the SSH key into the provided space.



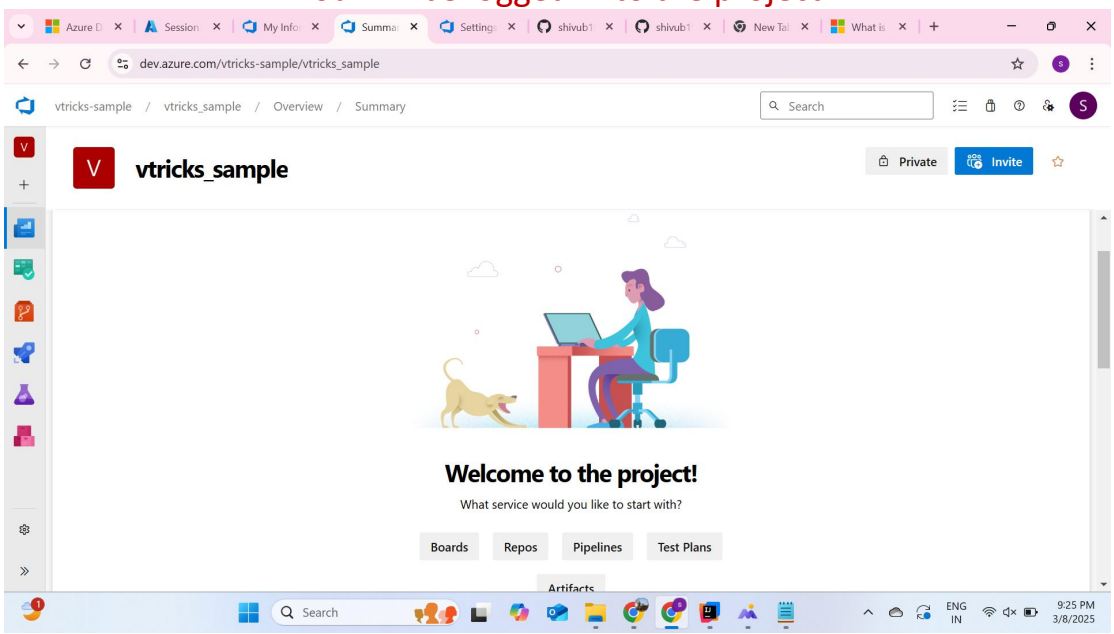
3. Now get back to the IDE's terminal and type the following command
4. git remote set-url origin <ur.git repo url>
5. git remote -v
6. git push --set-upstream origin main

7. git push

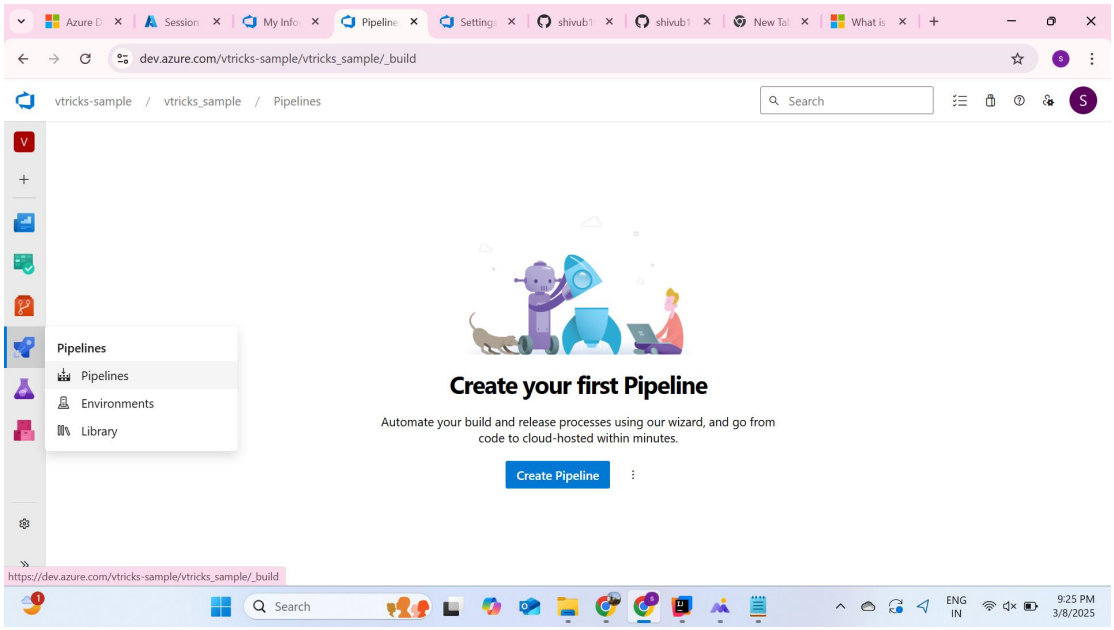
Open the azure devops and click on the create project, provide the project name



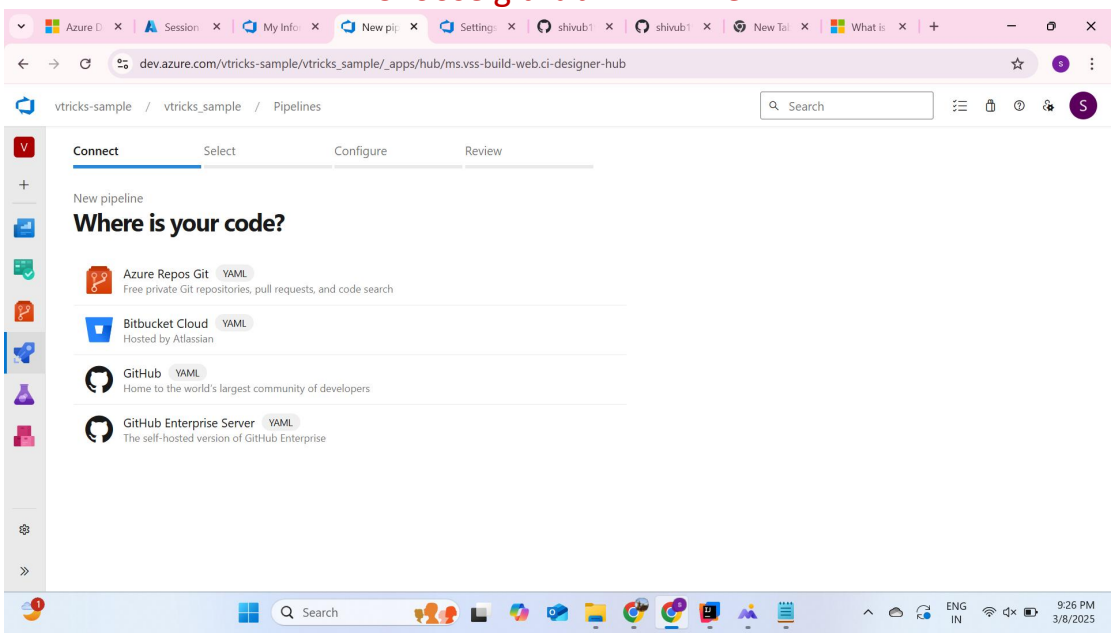
You will be logged in to the project



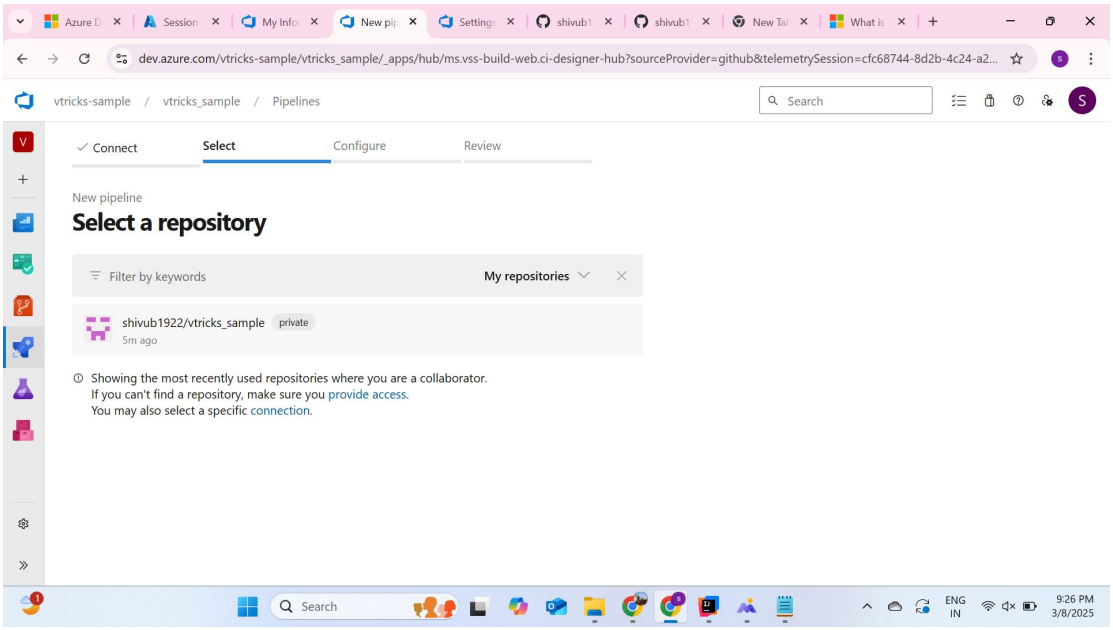
Click on the pipelines



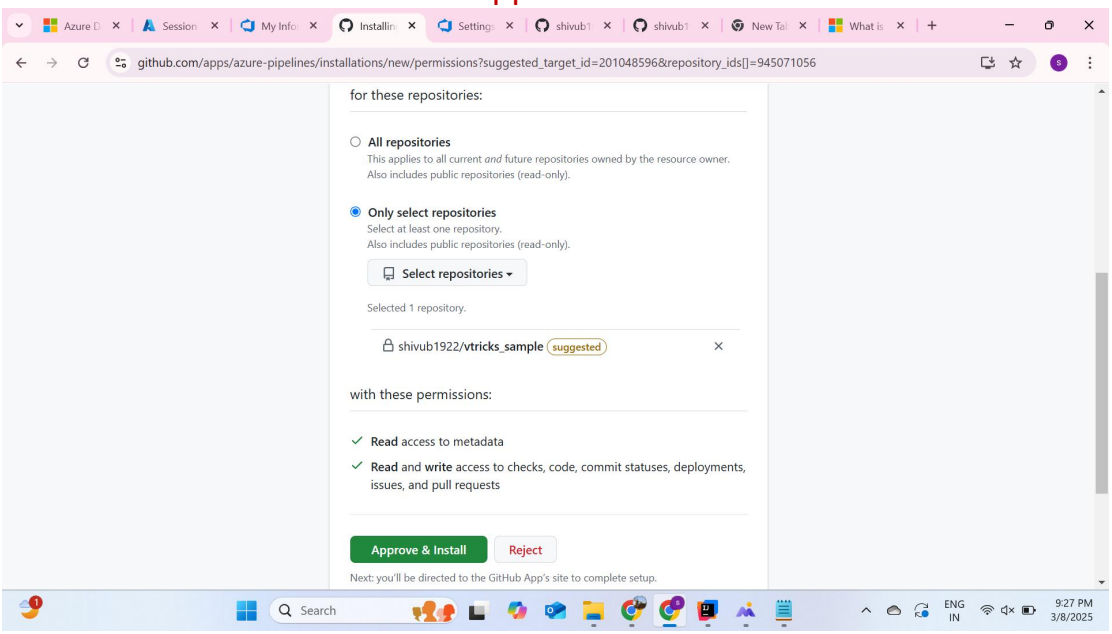
Choose github YAML file



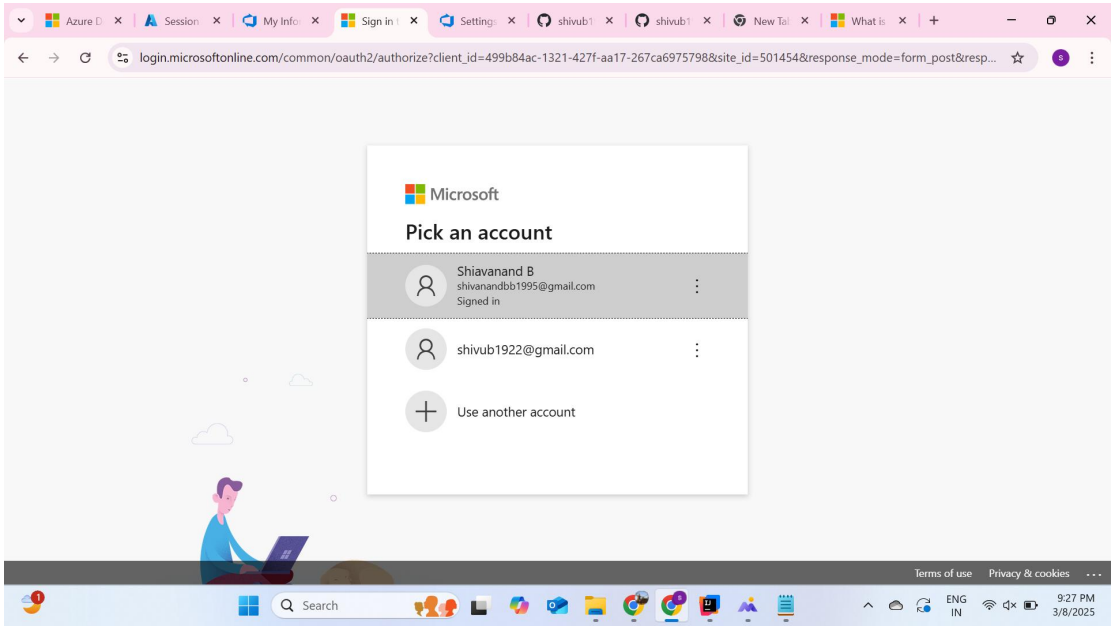
Then you will be prompted to your repo in the github, choose the necessary git repo



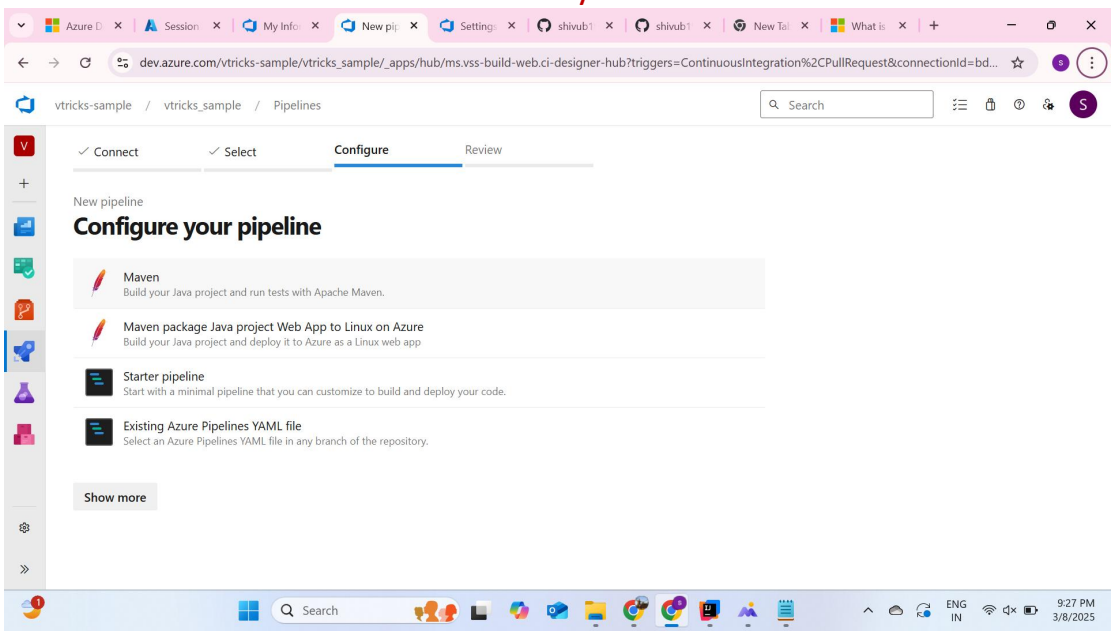
Click on approve and install



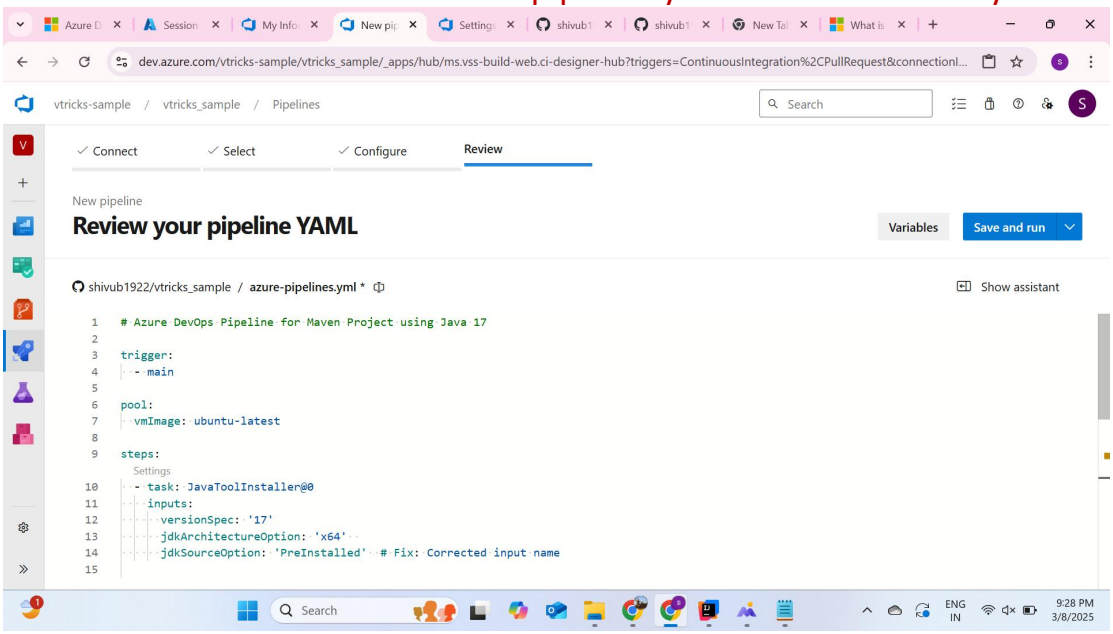
Choose the azure account



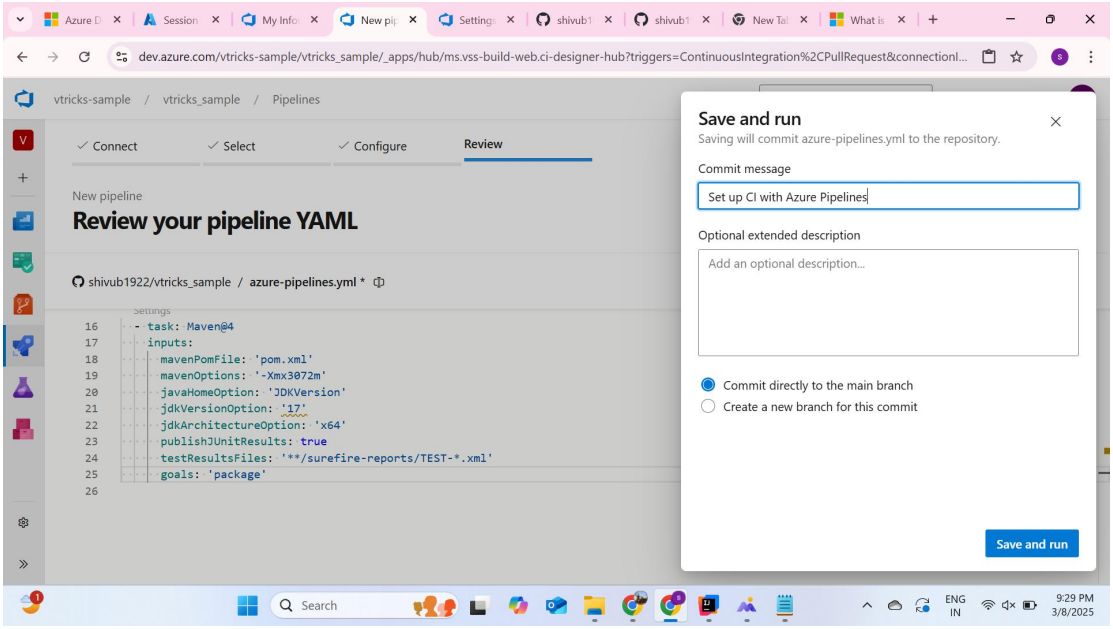
Choos ethe build system as maven



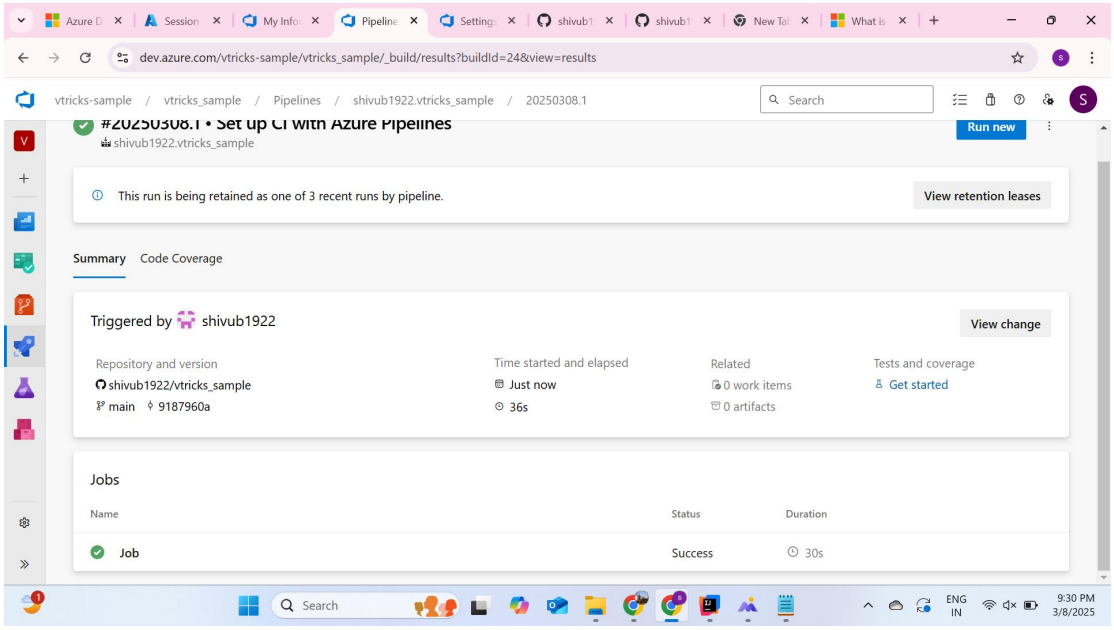
Then it will create the azurepipeline.yaml file automatically



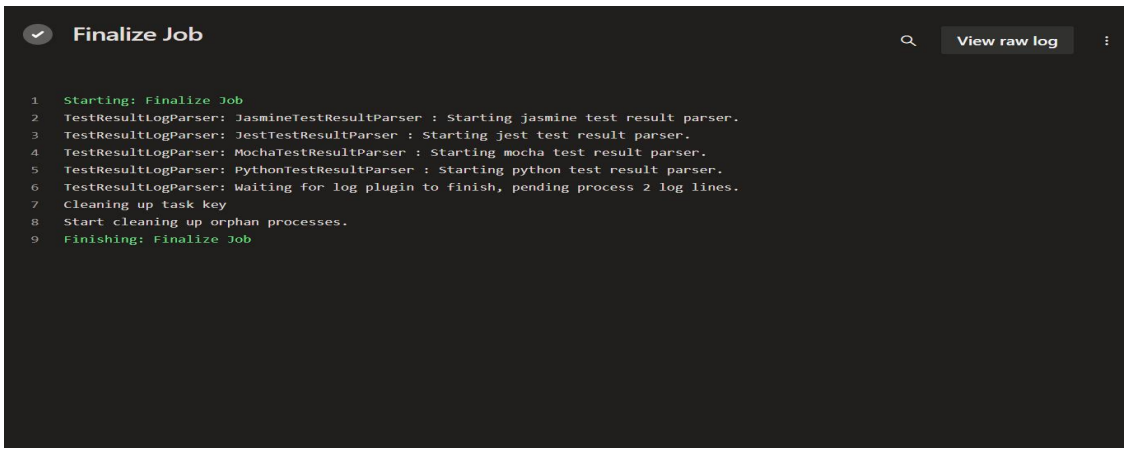
Then Save and run the pipeline,
Create a commit message and press the run button again.
Click on the created Job from the Jobs table.



Then it will take a minute to build the pipeline,



A successful job completion would be like this.



Running Unit Tests and Generating Reports

with Maven in Azure DevOps When you build your Maven project using Azure Pipelines, the build process usually includes running unit tests with the Maven Surefire plugin. This plugin executes tests (typically written with JUnit) and produces test result files in XML format. Azure Pipelines can then pick up these XML files and present them as part of

the build summary. Below are the steps and details to ensure that your unit tests are executed and the reports are published.

1. Maven Surefire Plugin and Test Reports What Happens During the Maven Build?

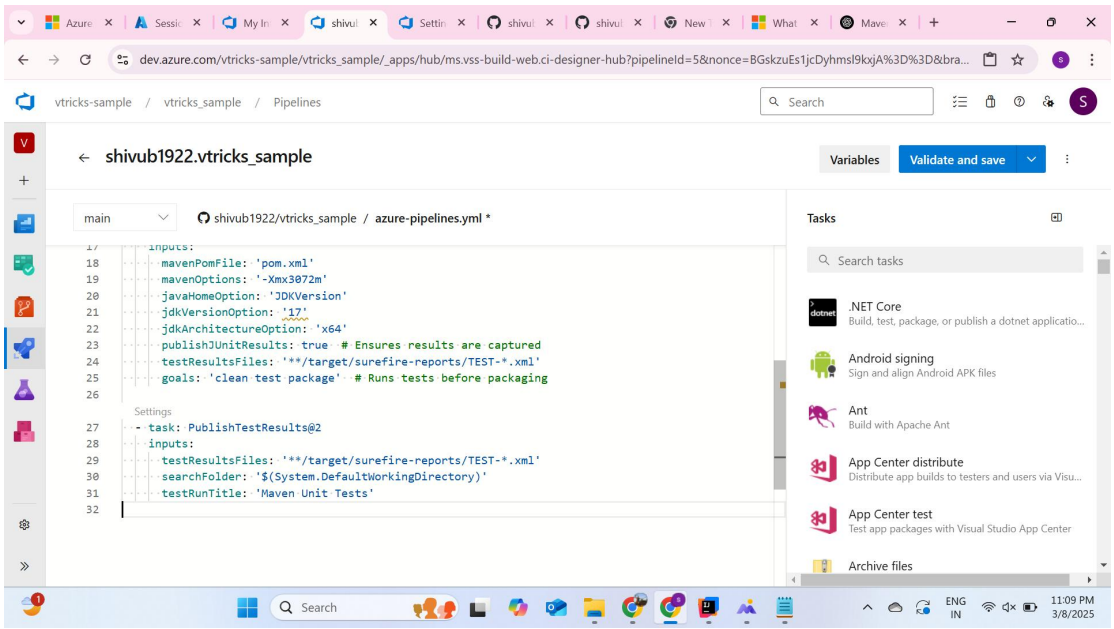
- Maven Surefire Plugin: When you run the command mvn clean package (or mvn test), the Surefire plugin automatically executes the unit tests found in the src/test/java directory.
- Test Report Generation: By default, the Surefire plugin creates XML reports in the target/surefire-reports/ directory. These files usually have names like TEST-.xml.
- Importance of Test Reports: These XML files contain detailed information on test execution, including the number of tests run, passed, failed, and any error messages or stack traces.

2. Configuring Your Azure Pipeline to Publish Test Results After your Maven build runs and tests are executed, you need to add a step in your Azure Pipeline YAML file that locates these test reports and publishes them in Azure DevOps. This is accomplished by using the **PublishTestResults@2** task.

Azurepipeline.yml file to publish the results

```
# Azure DevOps Pipeline for Maven Project using Java 17

trigger:
 - main

pool:
 vmImage: ubuntu-latest

steps:
 - task: JavaToolInstaller@0
   inputs:
    versionSpec: '17'
    jdkArchitectureOption: 'x64'
    jdkSourceOption: 'PreInstalled'

 - task: Maven@4
   inputs:
    mavenPomFile: 'pom.xml'
    mavenOptions: '-Xmx3072m'
```

```
    javaHomeOption: 'JDKVersion'
    jdkVersionOption: '17'
    jdkArchitectureOption: 'x64'
    publishJUnitResults: true  # Ensures results are captured
    testResultsFiles: '**/target/surefire-reports/TEST-*.xml'
    goals: 'clean test package'  # Runs tests before packaging

- task: PublishTestResults@2
  inputs:
    testResultsFiles: '**/target/surefire-reports/TEST-*.xml'
    searchFolder: '$(System.DefaultWorkingDirectory)'
    testRunTitle: 'Maven Unit Tests'
```



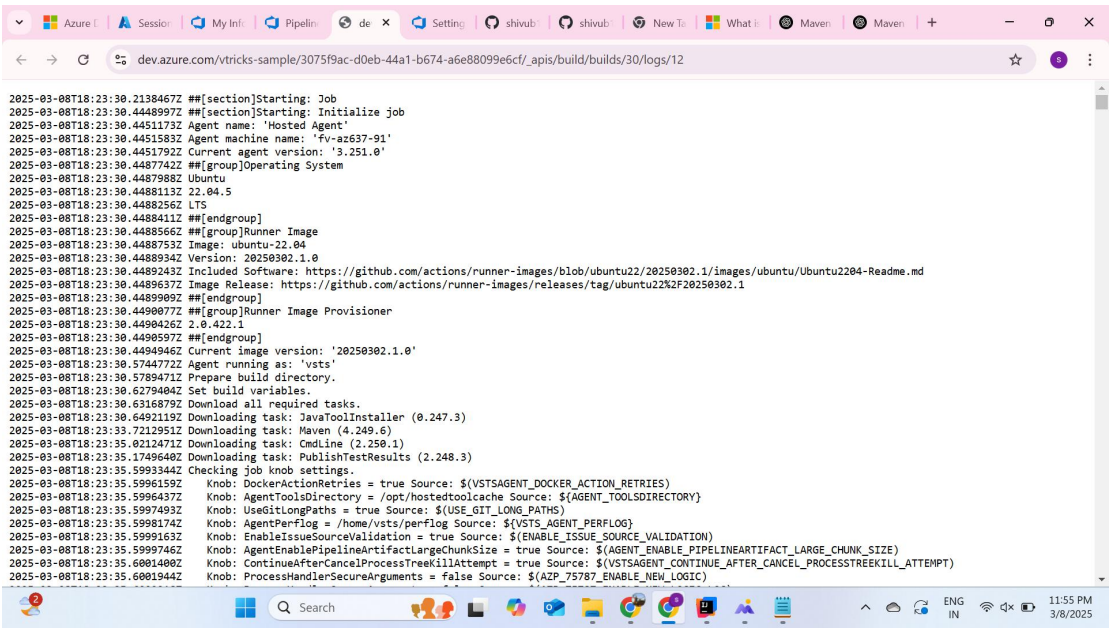
Running and Verifying the Pipeline

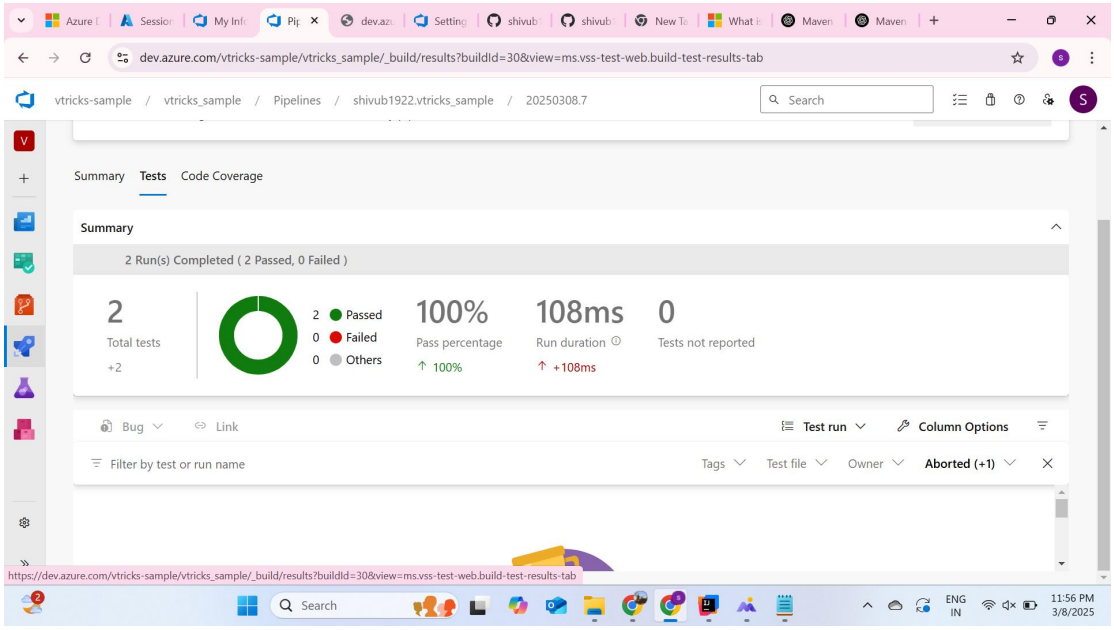
After committing the YAML file to your repository, the pipeline is triggered (either automatically or manually):

1. Trigger the Pipeline: Once your YAML file is saved in your repository, Azure Pipelines will pick up the changes. If not automatically triggered, you can click “Run pipeline” manually.

2. Monitor the Build Output: Navigate to the “Build” or “Logs” section of the pipeline run. o Confirm that the Maven task logs show the execution of tests and that the Surefire reports are created.

3. Review Test Reports: o Once the build completes, click on the “Tests” tab (often found on the pipeline summary page) to review the detailed test results.

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Search
Summary
Tests
Code Coverage
Summary
2 Run(s) Completed (2 Passed, 0 Failed)
2
Total tests
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2 Passed
0 Failed
0 Others
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