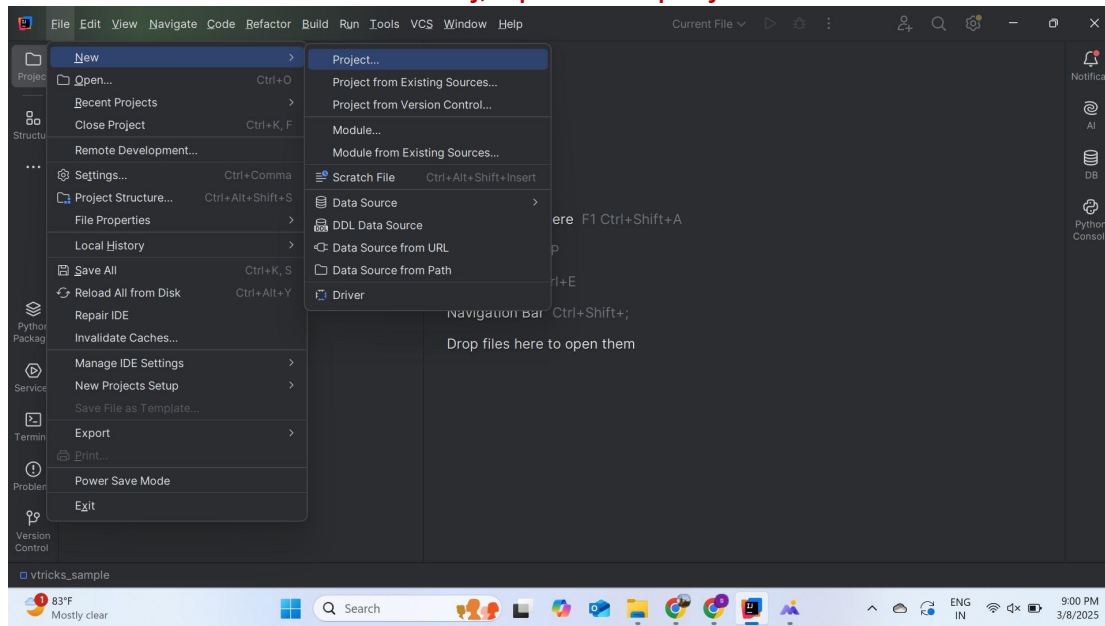
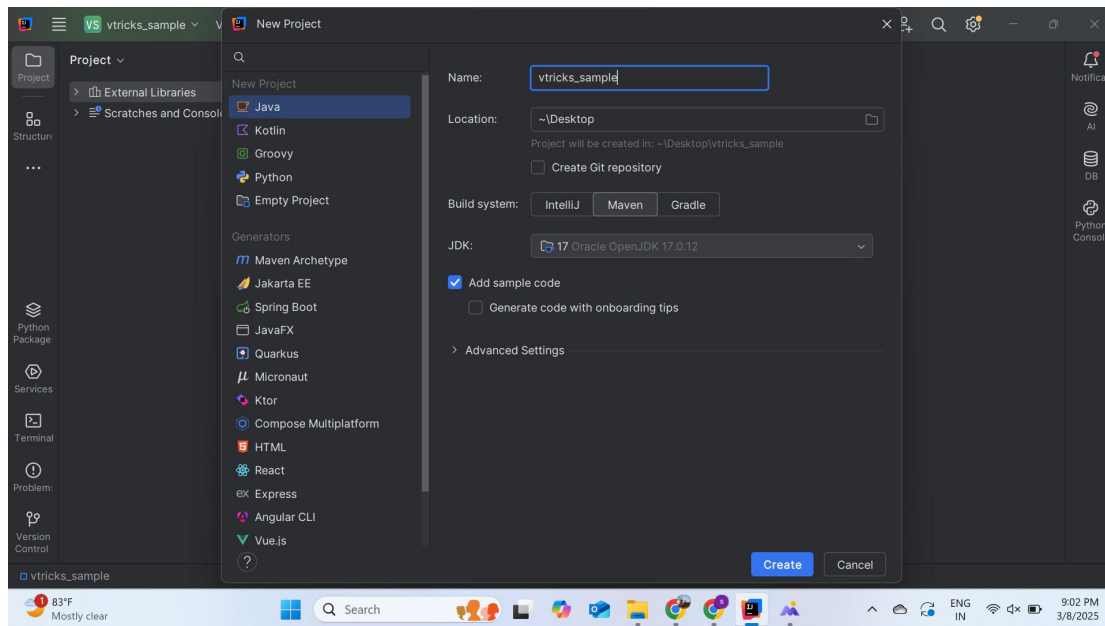


## Experiment 10 : Creating Build Pipelines: Building a Maven/Gradle Project with Azure Pipelines, Integrating Code Repositories (e.g., GitHub, Azure Repos), Running Unit Tests and Generating Reports

In intellij, open new project.



Provide the project name and choose build system as maven



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

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <project xmlns="http://maven.apache.org/POM/4.0.0"
3     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4     xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/
5     <modelVersion>4.0.0</modelVersion>
6
7     <groupId>org.example</groupId>
8     <artifactId>vtricks_sample</artifactId>
9     <version>1.0-SNAPSHOT</version>
10
11     <properties>
12         <maven.compiler.source>23</maven.compiler.source>
13         <maven.compiler.target>23</maven.compiler.target>
14         <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
15     </properties>
16 </project>
```

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

github.com/new

## Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Required fields are marked with an asterisk (\*).

Owner \* shivub1922 / Repository name \* vtricks\_sample  
✔ vtricks\_sample is available.

Great repository names are short and memorable. Need inspiration? How about [expert-palm-tree](#)?

Description (optional)

☐ Public  
Anyone on the internet can see this repository. You choose who can commit.

☒ Private  
You choose who can see and commit to this repository.

Initialize this repository with:

## Create the repo click on the Create repository

github.com/new

☒ Private  
You choose who can see and commit to this repository.

Initialize this repository with:

☒ Add a README file  
This is where you can write a long description for your project. [Learn more about READMEs.](#)

Add .gitignore  
.gitignore template: None  
Choose which files not to track from a list of templates. [Learn more about ignoring files.](#)

Choose a license  
License: None  
A license tells others what they can and can't do with your code. [Learn more about licenses.](#)

🔒 You are creating a private repository in your personal account.

Create repository

© 2025 GitHub, Inc. [Terms](#) [Privacy](#) [Security](#) [Status](#) [Docs](#) [Contact](#) [Manage cookies](#) [Do not share my personal information](#)

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

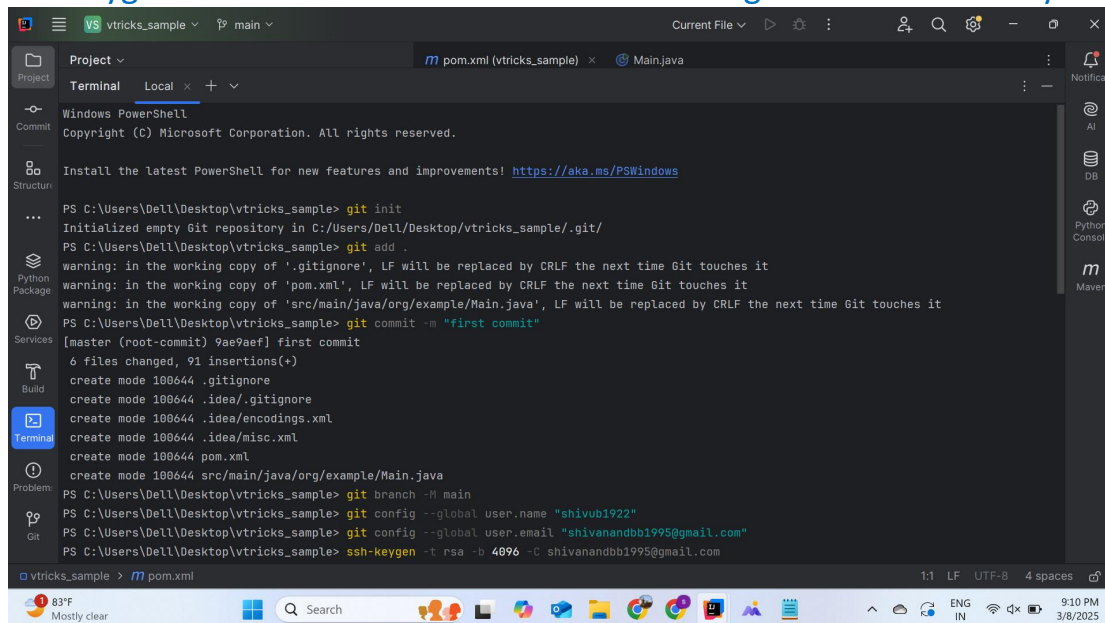
git init --to initialize the git

git add . -- add all files to the git

git commit -m "first commit" -- to commit the added files

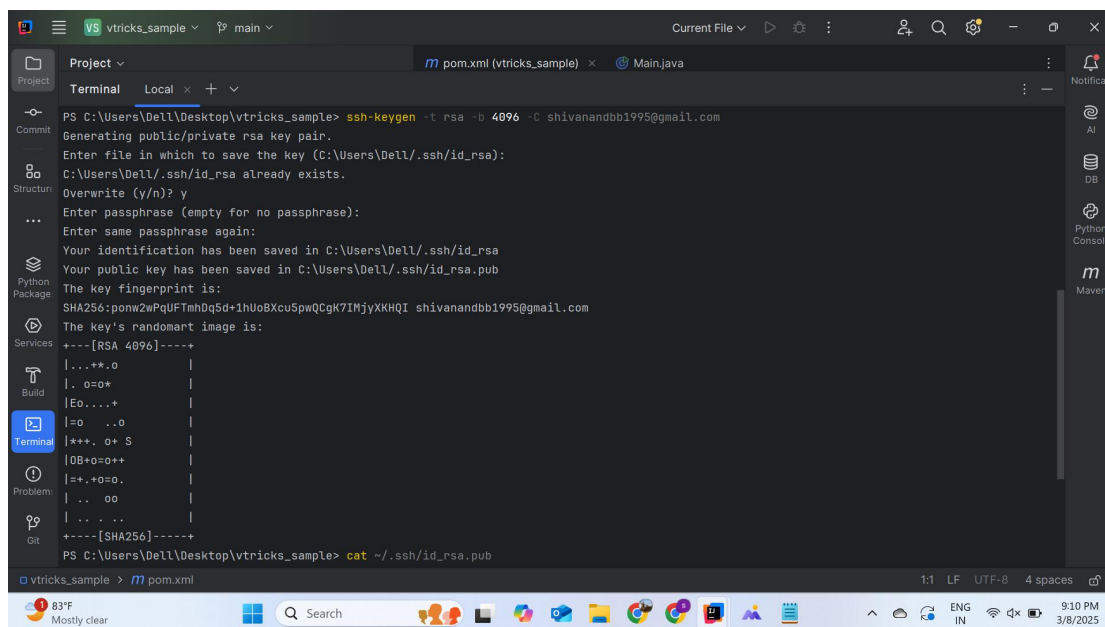
git branch -M main -- to switch to branch main

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



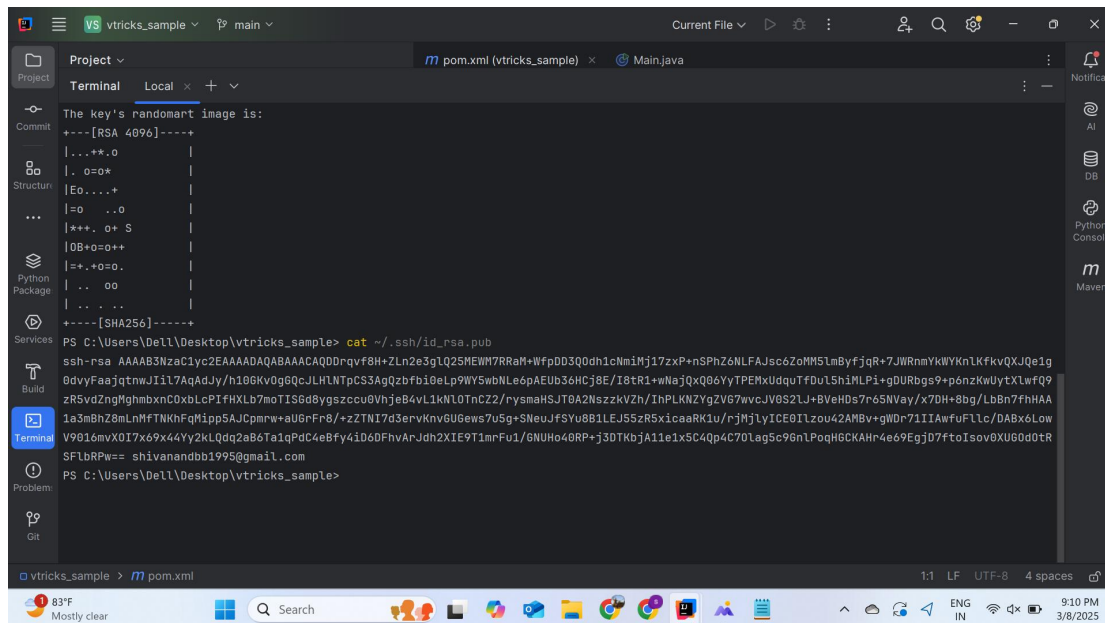
```
PS C:\Users\De\l\Desktop\vtricks_sample> git init
Initialized empty Git repository in C:/Users/De\l/Desktop/vtricks_sample/.git/
PS C:\Users\De\l\Desktop\vtricks_sample> git add .
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'pom.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'src/main/java/org/example/Main.java', LF will be replaced by CRLF the next time Git touches it
PS C:\Users\De\l\Desktop\vtricks_sample> git commit -m "first commit"
[master (root-commit) 9ae9aef] first commit
6 files changed, 91 insertions(+)
create mode 100644 .gitignore
create mode 100644 .idea/.gitignore
create mode 100644 .idea/encodings.xml
create mode 100644 .idea/misc.xml
create mode 100644 pom.xml
create mode 100644 src/main/java/org/example/Main.java
PS C:\Users\De\l\Desktop\vtricks_sample> git branch -M main
PS C:\Users\De\l\Desktop\vtricks_sample> git config --global user.name "shivub1922"
PS C:\Users\De\l\Desktop\vtricks_sample> git config --global user.email "shivanandbb1995@gmail.com"
PS C:\Users\De\l\Desktop\vtricks_sample> ssh-keygen -t rsa -b 4096 -C shivanandbb1995@gmail.com
```

press ENTER for all questions



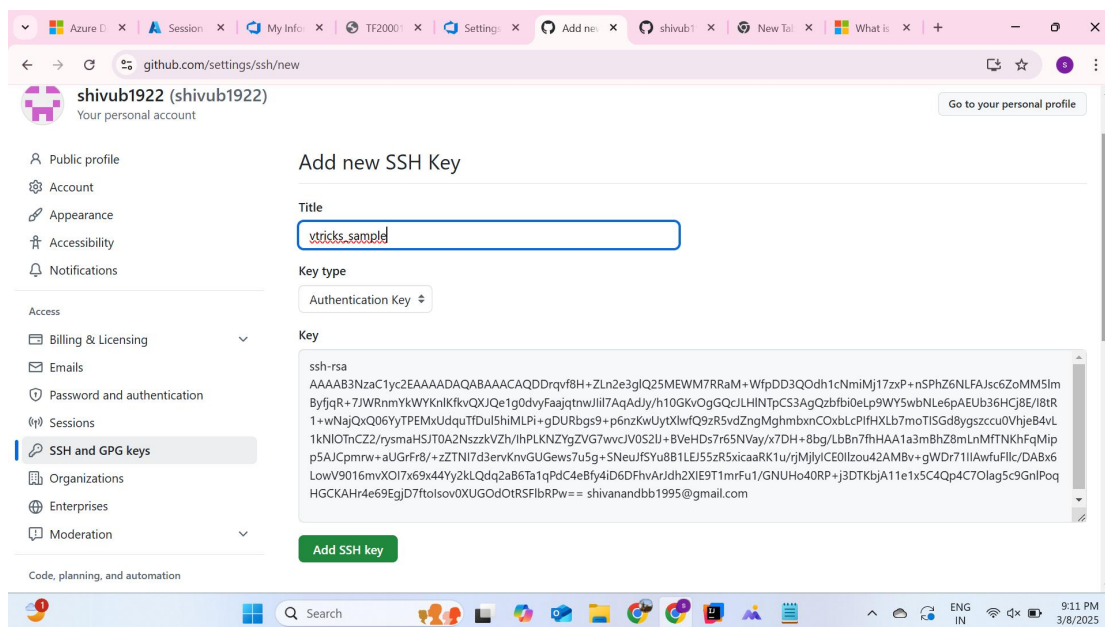
```
PS C:\Users\De\l\Desktop\vtricks_sample> ssh-keygen -t rsa -b 4096 -C shivanandbb1995@gmail.com
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\De\l\.ssh/id_rsa):
C:\Users\De\l\.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\De\l\.ssh/id_rsa
Your public key has been saved in C:\Users\De\l\.ssh/id_rsa.pub
The key fingerprint is:
SHA256:ponw2wPqUFTmhDq5d+1hUo8XcuSpmQcGK7IHjyXKHQI shivanandbb1995@gmail.com
The key's randomart image is:
+---[RSA 4096]-----+
|...+..o|
|. O=O*|
|Eo....+|
|o ..o|
|*+. O+ S|
|OB+O=O++|
|=.+O=O.|
|.. oo|
|.. ..|
+---[SHA256]-----+
PS C:\Users\De\l\Desktop\vtricks_sample> cat ~/.ssh/id_rsa.pub
```

\$ cat ~/.ssh/id\_rsa.pub (copy the printed SSH key)



```
The key's randomart image is:  
+----[RSA 4096]----+  
|...+*..o|  
|.o=+*|  
|Eo....+|  
|..o..o|  
|*+..o+S|  
|OB+o=+o+|  
|+=..+o=+o|  
|..oo|  
|..o..|  
+-----[SHA256]-----+  
PS C:\Users\De11\Desktop\vtricks_sample> cat ~/.ssh/id_rsa.pub  
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCAQDrqvf8H+ZLn2e3glQ25MEWM7RRaM+WfpDD3Q0dh1cNmIj17zxP+nSPHz6NLFajsc6ZoMM5lmByfjqR+7JWRnmYkWyKnLkfkvQXJqE1g  
0dvYFaajqtnwJI17AqAdjy/h10GKvOgGQcJLHNTpCS3AgQzbfbi0eLp9WY5wbNLe6pAEUbs36HCj8E/I8tR1+wNajQx06YyTPEMxUdquTFduLShiMLPi+gDURbgs9+p6nzKwUytXlwFQ9  
zR5vdZngMghmbxnc0xbLcPIfHXLB7mTISg8Ygszccu0VhjeB4yL1kNL0TnG22/rysmahSJTOA2NszzkVZh/IhPLKNZygZVG7wvcJV0S2LJ+BVeHDs7r65NVay/x7DH+8bg/LbBn7FhHAA  
1a3mBhZ8mLnMFTNKHFqMipSAJCpmrw+aUGrFr8/+zZTNI7d3ervKvGUGews7u5g+SNeuJfSYu8B1LEJ55zR5xicaaRK1u/rjMjlyICE0ILzou42AMBv+gWDr711IAwfuFllc/DABx6Low  
V9016mvXOI7x69x44Yy2kLQdq2aB6Ta1qPdC4eBfy4iD6DFhArJdh2XIE9T1mrFu1/GNUHo40RP+j3DTKbjA11e1x5C4Qp4C70Lag5c9GnlPoqHGCKAHR4e69EgJd7ftoIsv0XUG0d0tR  
SFLbRPw== shivanandbb1995@gmail.com  
PS C:\Users\De11\Desktop\vtricks_sample>
```

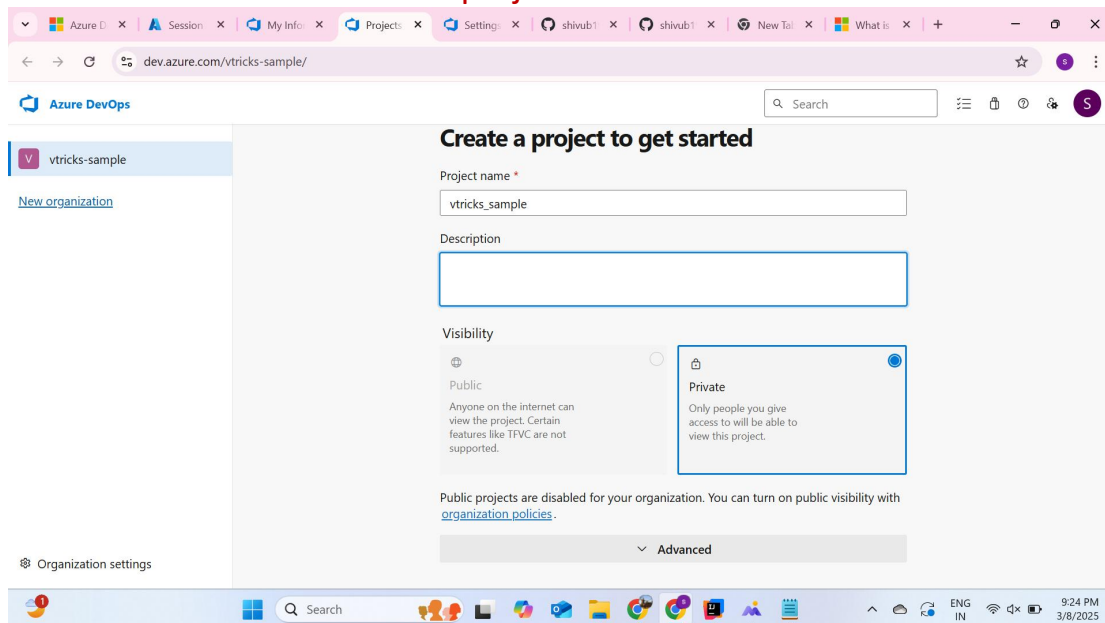
1. Now go to the SSH and GPG section in the GitHub settings option.
  2. Click on the New SSH key button.
- Choose a suitable name and paste the SSH key into the provided space.



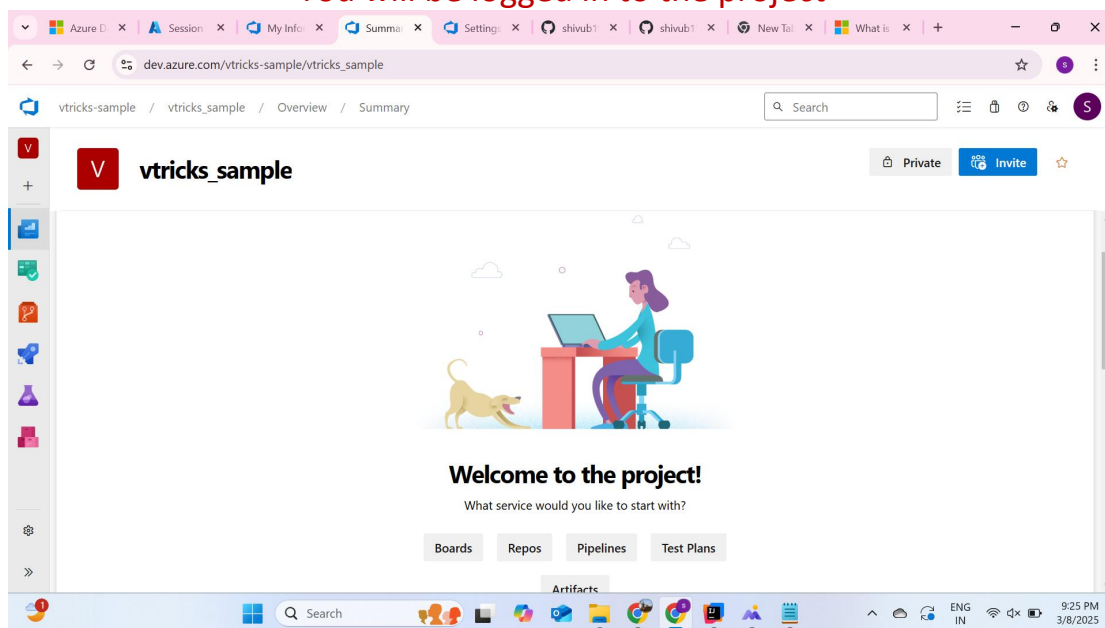
3. Now get back to the IDE's terminal and type the following command
4. git remote set-url origin <ur.git repo url>
5. git remote -v
6. git push --set-upstream origin main

## 7. git push

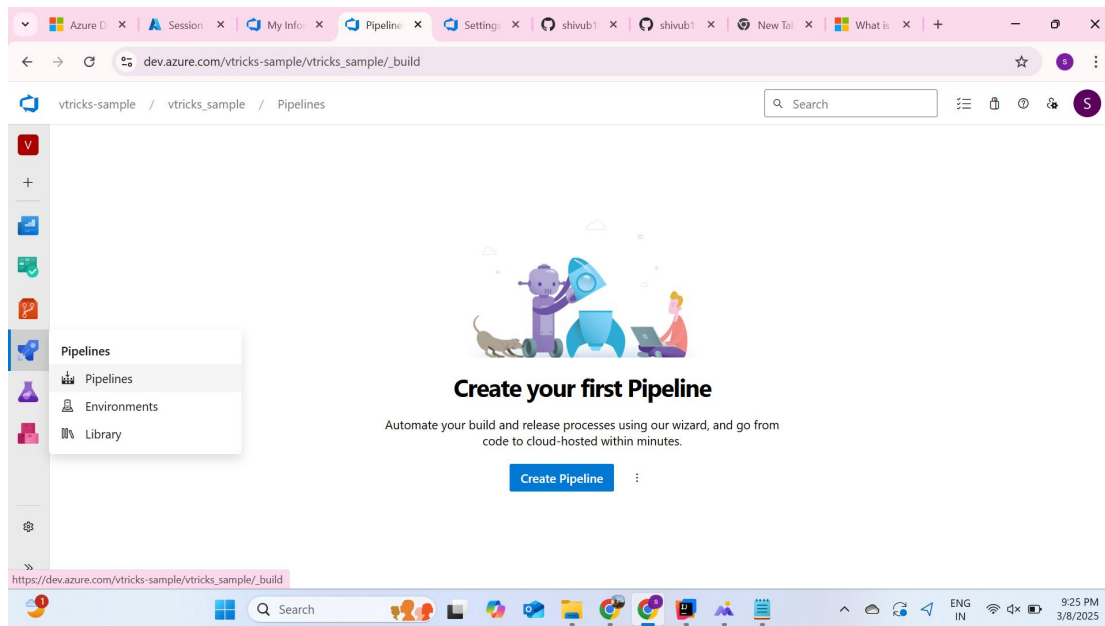
Open the azure devops and click on the create project, provide the project name



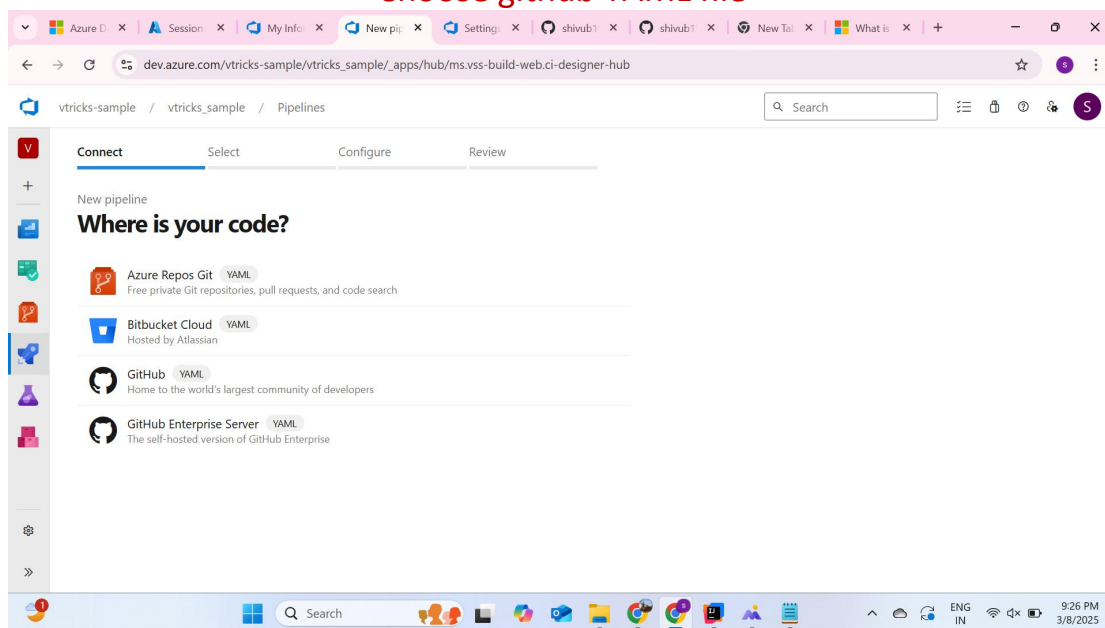
You will be logged in to the project



Click on the pipelines

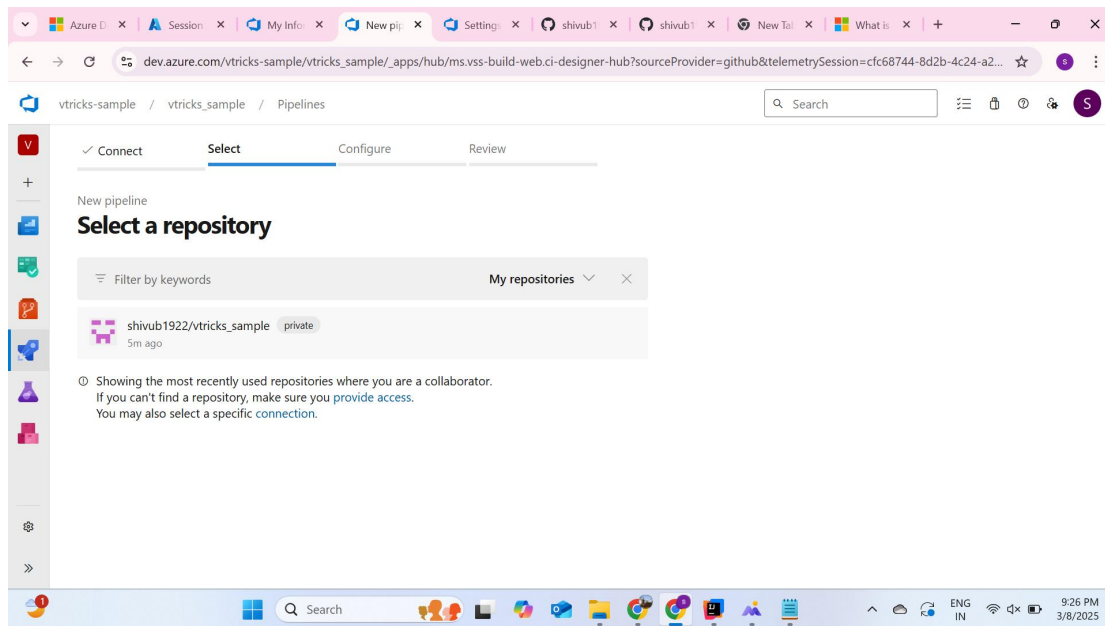


## Choose github YAML file

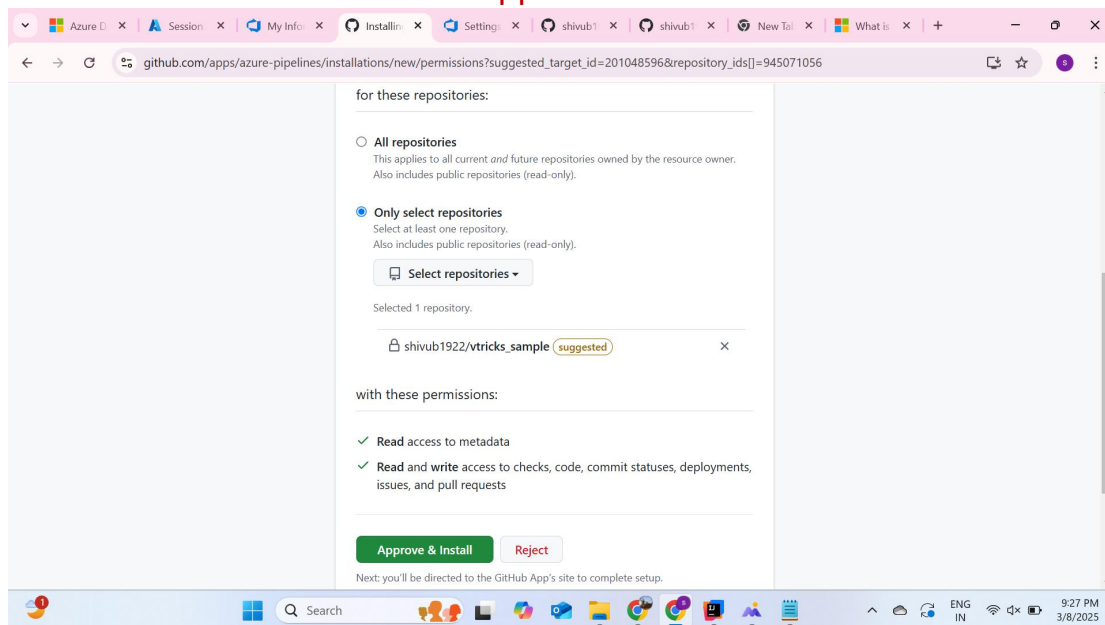


Then you will be prompted to your repo in the github, choose the necessary git repo



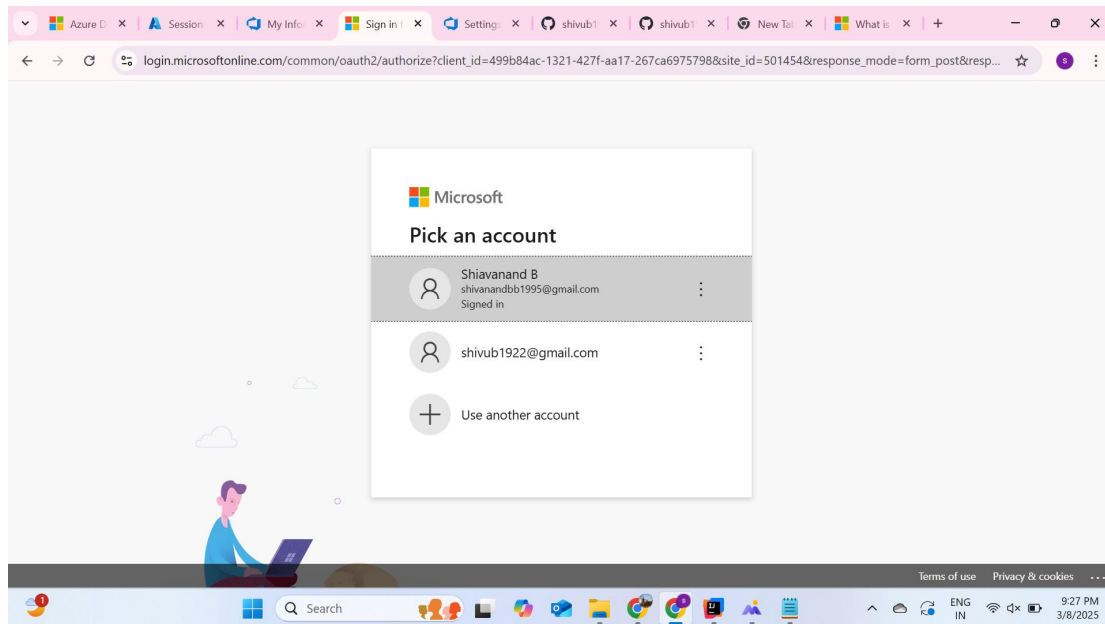


Click on approve and install

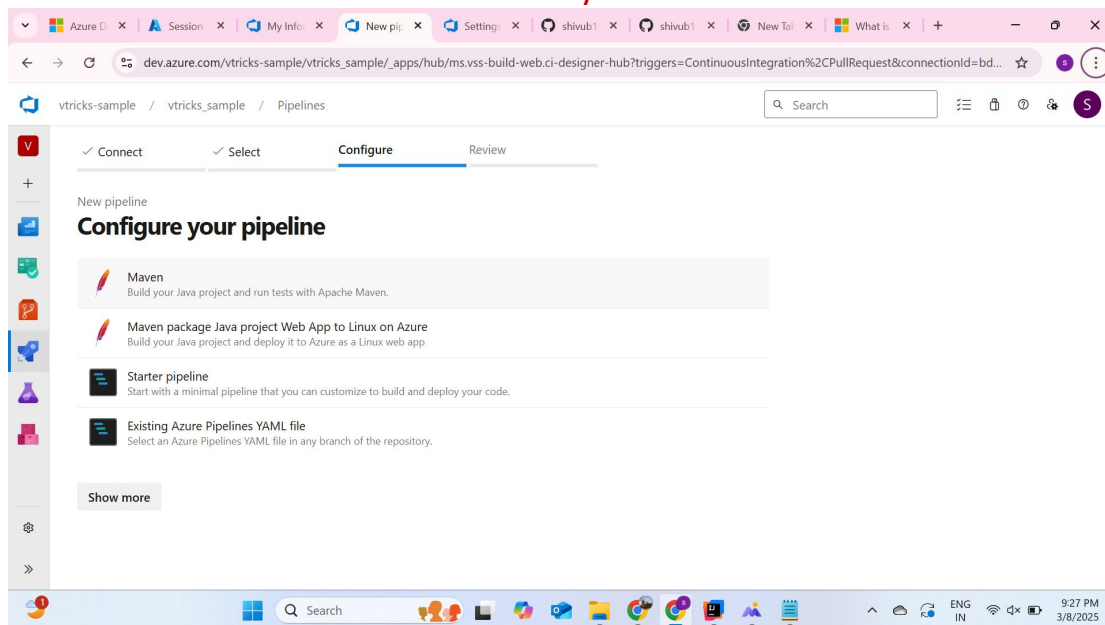




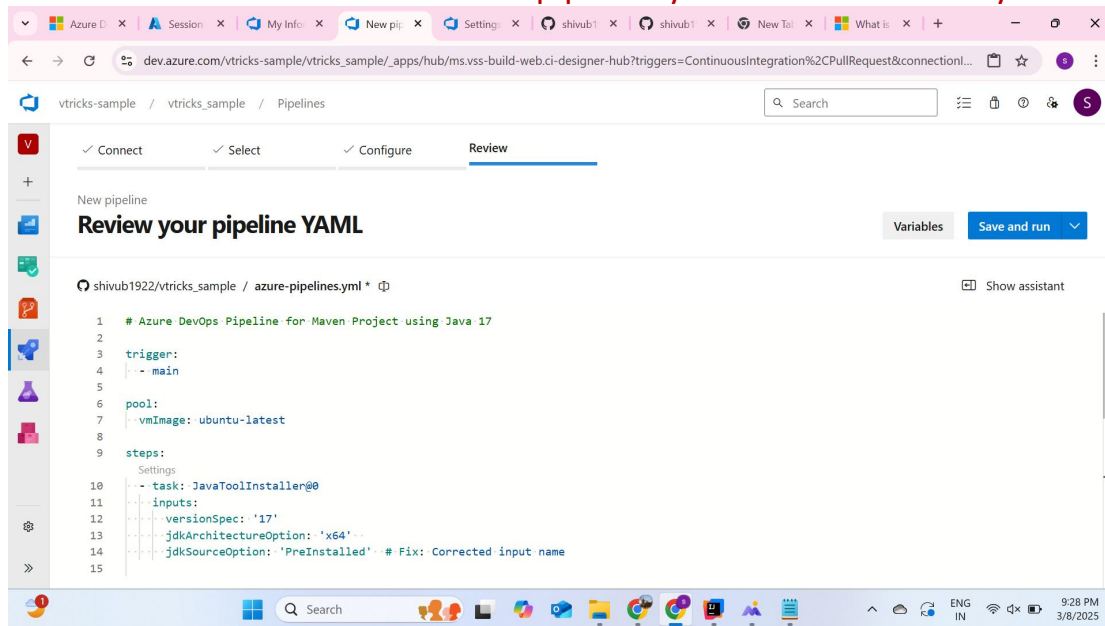
## Choose the azure account



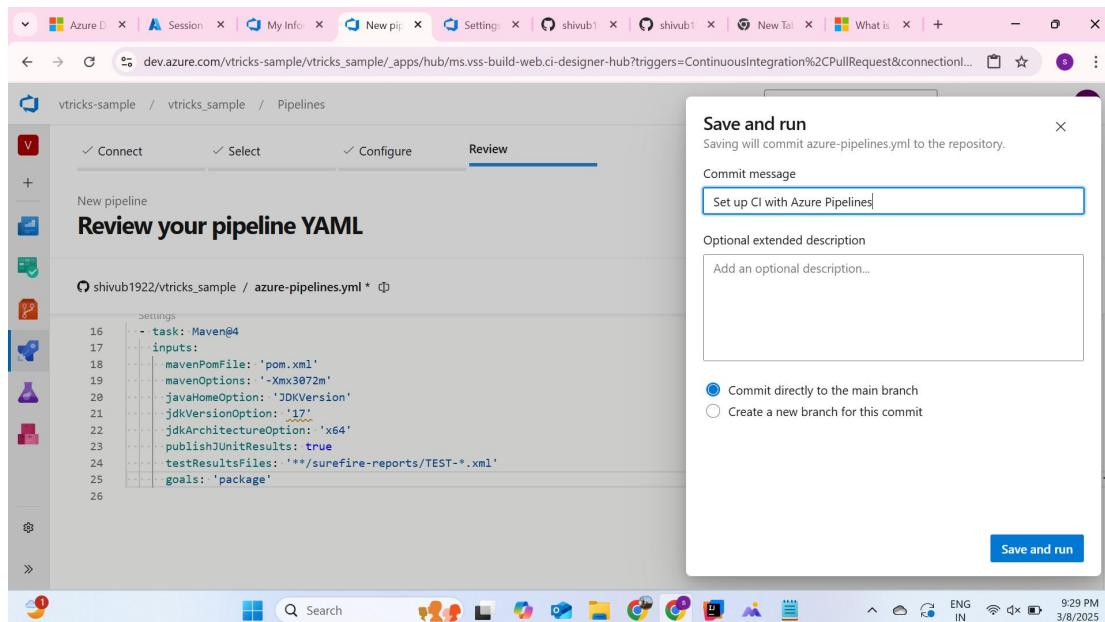
## Choose the build system as maven



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,

The screenshot shows the Azure DevOps web interface for a pipeline named 'Set up CI with Azure Pipelines'. The pipeline is in a 'Completed' state, indicated by a green checkmark. The build ID is 248, and the view is set to 'Results'. The interface shows the pipeline's summary, including the repository 'shivub1922.vtricks\_sample' and the build configuration. The build was triggered by 'shivub1922' and completed successfully in 30 seconds. The 'Jobs' section shows a single job named 'Job' that also completed successfully in 30 seconds. The interface includes a search bar, a 'Run new' button, and a 'View retention leases' link.

A successful job completion would be like this.

The screenshot shows the 'Finalize Job' log output in the Azure DevOps interface. The log is displayed in a dark-themed editor with line numbers. The output shows the following steps:

```
1 Starting: Finalize Job
2 TestResultLogParser: JasmineTestResultParser : Starting jasmine test result parser.
3 TestResultLogParser: JestTestResultParser : Starting jest test result parser.
4 TestResultLogParser: MochaTestResultParser : Starting mocha test result parser.
5 TestResultLogParser: PythonTestResultParser : Starting python test result parser.
6 TestResultLogParser: Waiting for log plugin to finish, pending process 2 log lines.
7 Cleaning up task key
8 Start cleaning up orphan processes.
9 Finishing: Finalize Job
```

## 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'

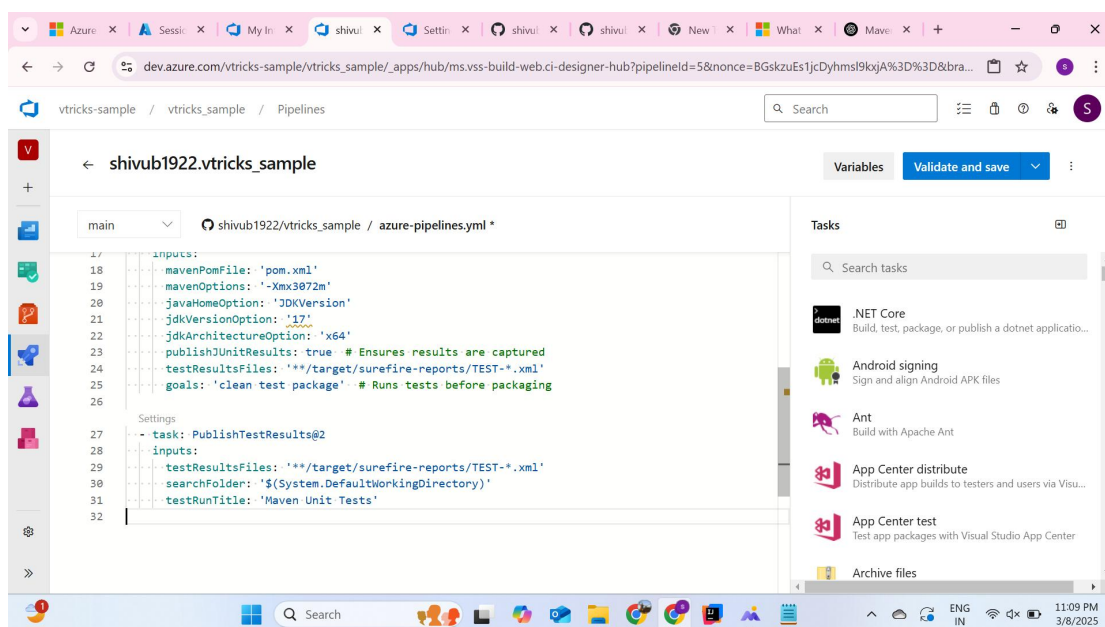
mavenOptions: '-Xmx3072m'

```
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'
```



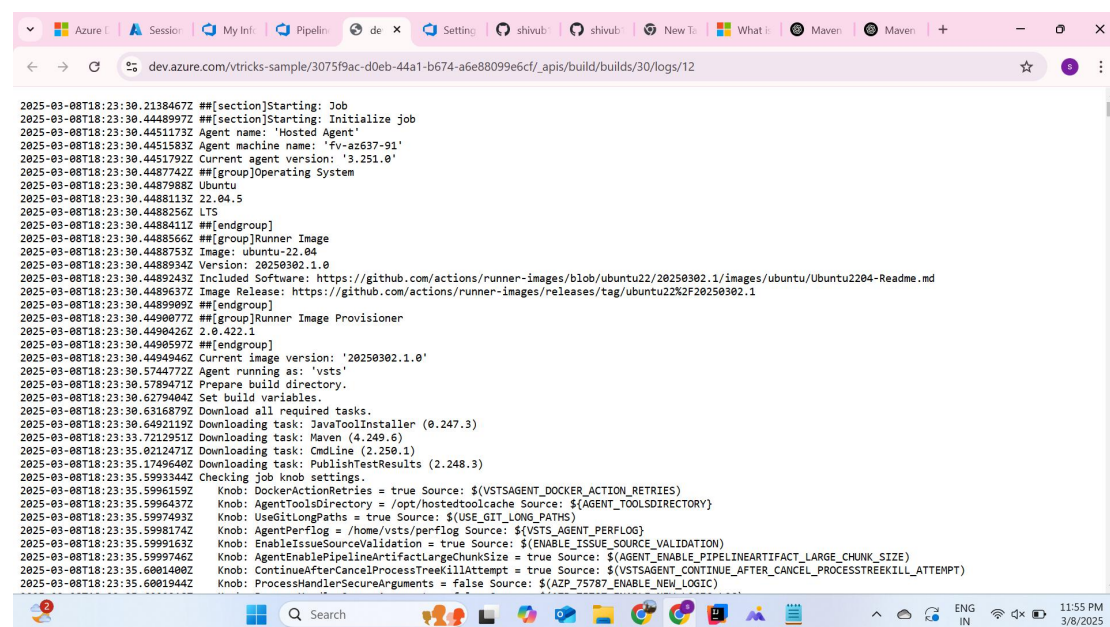
## Running and Verifying the Pipeline

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.



The screenshot shows a web browser window displaying the build logs for a pipeline run. The address bar shows the URL: `dev.azure.com/vtricks-sample/3075f9ac-d0eb-44a1-b674-a6e88099e6cf/_apis/build/builds/30/logs/12`. The log content is as follows:

```
2025-03-08T18:23:30.2138467Z ##[section]Starting: Job
2025-03-08T18:23:30.4448997Z ##[section]Starting: Initialize job
2025-03-08T18:23:30.4451173Z Agent name: 'Hosted Agent'
2025-03-08T18:23:30.4451583Z Agent machine name: 'fv-az637-91'
2025-03-08T18:23:30.4451792Z Current agent version: '3.251.0'
2025-03-08T18:23:30.4487742Z ##[group]Operating System
2025-03-08T18:23:30.4487988Z Ubuntu
2025-03-08T18:23:30.4488113Z 22.04.5
2025-03-08T18:23:30.4488256Z LTS
2025-03-08T18:23:30.4488411Z ##[endgroup]
2025-03-08T18:23:30.4488566Z ##[group]Runner Image
2025-03-08T18:23:30.4488753Z Image: ubuntu-22.04
2025-03-08T18:23:30.4488934Z Version: 20250302.1.0
2025-03-08T18:23:30.4489243Z Included Software: https://github.com/actions/runner-images/blob/ubuntu22/20250302.1/images/ubuntu/Ubuntu2204-Readme.md
2025-03-08T18:23:30.4489537Z Image Release: https://github.com/actions/runner-images/releases/tag/ubuntu22%2F20250302.1
2025-03-08T18:23:30.4489909Z ##[endgroup]
2025-03-08T18:23:30.4490077Z ##[group]Runner Image Provisioner
2025-03-08T18:23:30.4490426Z 2.0.422.1
2025-03-08T18:23:30.4490597Z ##[endgroup]
2025-03-08T18:23:30.4494946Z Current image version: '20250302.1.0'
2025-03-08T18:23:30.5744772Z Agent running as: 'vsts'
2025-03-08T18:23:30.5789471Z Prepare build directory.
2025-03-08T18:23:30.6279404Z Set build variables.
2025-03-08T18:23:30.6316879Z Download all required tasks.
2025-03-08T18:23:30.6492119Z Downloading task: JavaToolInstaller (0.247.3)
2025-03-08T18:23:30.7212951Z Downloading task: Maven (4.249.6)
2025-03-08T18:23:30.80212471Z Downloading task: CmdLine (2.250.1)
2025-03-08T18:23:30.1749640Z Downloading task: PublishTestResults (2.248.3)
2025-03-08T18:23:30.5993344Z Checking job knob settings.
2025-03-08T18:23:30.5996159Z Knob: DockerActionRetries = true Source: $(VSTSAGENT_DOCKER_ACTION_RETRIES)
2025-03-08T18:23:30.5996437Z Knob: AgentToolsDirectory = /opt/hostedtoolcache Source: $(AGENT_TOOLS_DIRECTORY)
2025-03-08T18:23:30.5997493Z Knob: UseGitLongPaths = true Source: $(USE_GIT_LONG_PATHS)
2025-03-08T18:23:30.5998174Z Knob: AgentPerflog = /home/vsts/perflog Source: $(VSTS_AGENT_PERFLOG)
2025-03-08T18:23:30.5999163Z Knob: EnableIssueSourceValidation = true Source: $(ENABLE_ISSUE_SOURCE_VALIDATION)
2025-03-08T18:23:30.5999746Z Knob: AgentEnablePipelineArtifactLargeChunkSize = true Source: $(AGENT_ENABLE_PIPELINEARTIFACT_LARGE_CHUNK_SIZE)
2025-03-08T18:23:30.6001400Z Knob: ContinueAfterCancelProcessTreeKillAttempt = true Source: $(VSTSAGENT_CONTINUE_AFTER_CANCEL_PROCESSTREEKILL_ATTEMPT)
2025-03-08T18:23:30.6001944Z Knob: ProcessHandlerSecureArguments = false Source: $(AZP_75787_ENABLE_NEW_LOGIC)
```

dev.azure.com/vtricks-sample/vtricks\_sample/\_build/results?buildId=308&view=ms.vss-test-web.build-test-results-tab

vtricks-sample / vtricks\_sample / Pipelines / shivub1922.vtricks\_sample / 20250308.7

Search

Summary Tests Code Coverage

Summary

2 Run(s) Completed ( 2 Passed, 0 Failed )

2

Total tests

+2

2 Passed

0 Failed

0 Others

100%

Pass percentage

↑ 100%

108ms

Run duration

↑ +108ms

0

Tests not reported

Bug Link

Test run Column Options

Filter by test or run name Tags Test file Owner Aborted (+1)

https://dev.azure.com/vtricks-sample/vtricks\_sample/\_build/results?buildId=308&view=ms.vss-test-web.build-test-results-tab

Search

ENG IN 11:56 PM 3/8/2025