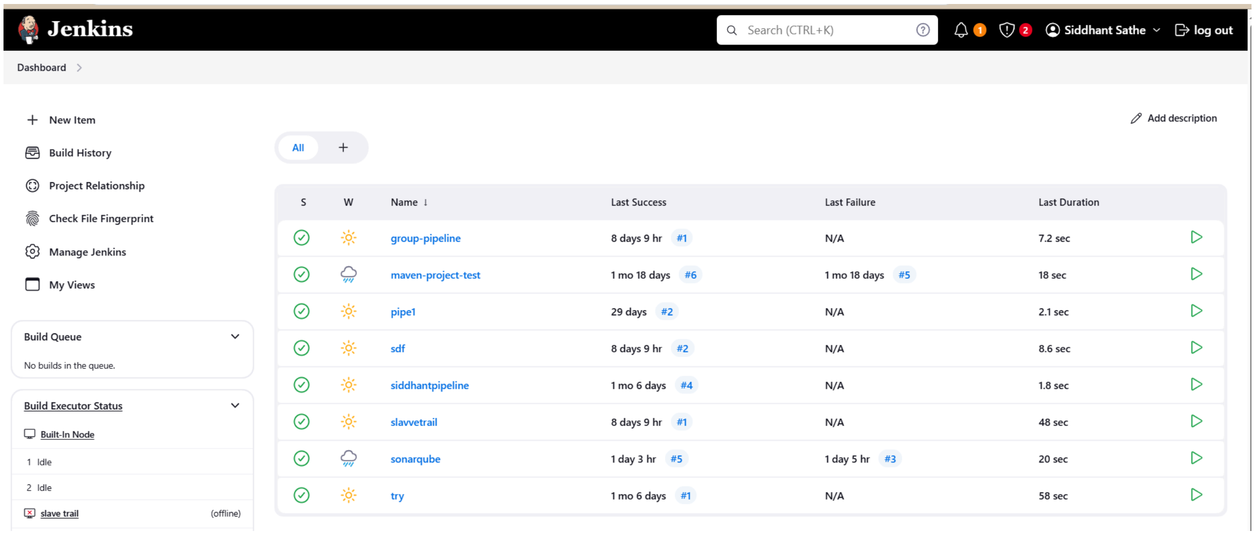
Siddhant Sathe **D15A/51**

Experiment 7

Aim: To understand Static Analysis SAST process and learn to integrate Jenkins SAST to SonarQube/GitLab**.**

Theory:

Step-1: Open up Jenkins Dashboard on localhost, port 8080 or whichever port it is at for you.



Build Queue

No builds in the queue.

Build Executor Status

Built-In Node

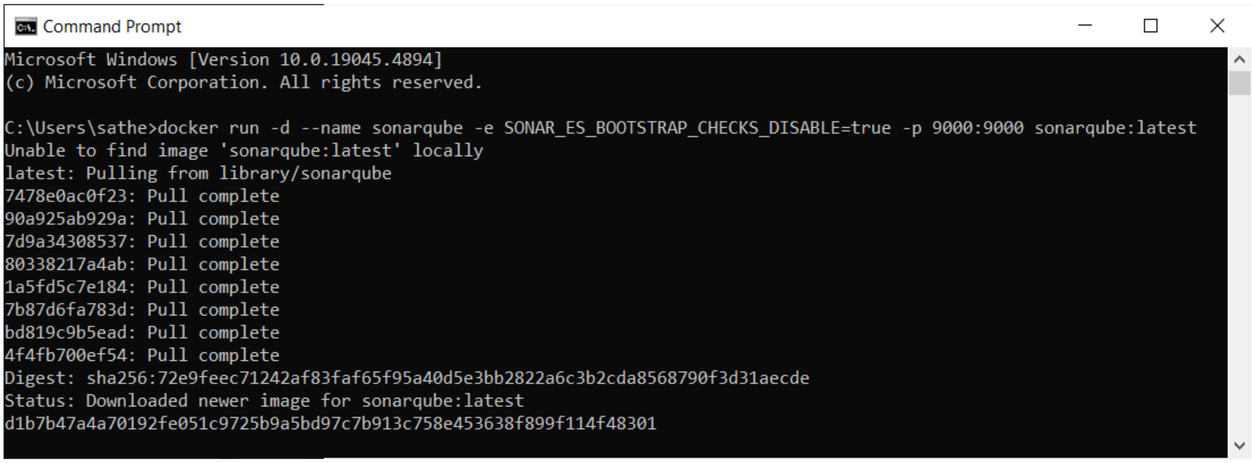
1 Idle

2 Idle

slave trail (offline)

S	W	Name ↓	Last Success	Last Failure	Last Duration	
✓	☀	group-pipeline	8 days 9 hr #1	N/A	7.2 sec	▷
✓	🌧	maven-project-test	1 mo 18 days #6	1 mo 18 days #5	18 sec	▷
✓	☀	pipe1	29 days #2	N/A	2.1 sec	▷
✓	☀	sdf	8 days 9 hr #2	N/A	8.6 sec	▷
✓	☀	siddhantpipeline	1 mo 6 days #4	N/A	1.8 sec	▷
✓	☀	slavvetrail	8 days 9 hr #1	N/A	48 sec	▷
✓	🌧	sonarqube	1 day 3 hr #5	1 day 5 hr #3	20 sec	▷
✓	☀	try	1 mo 6 days #1	N/A	58 sec	▷

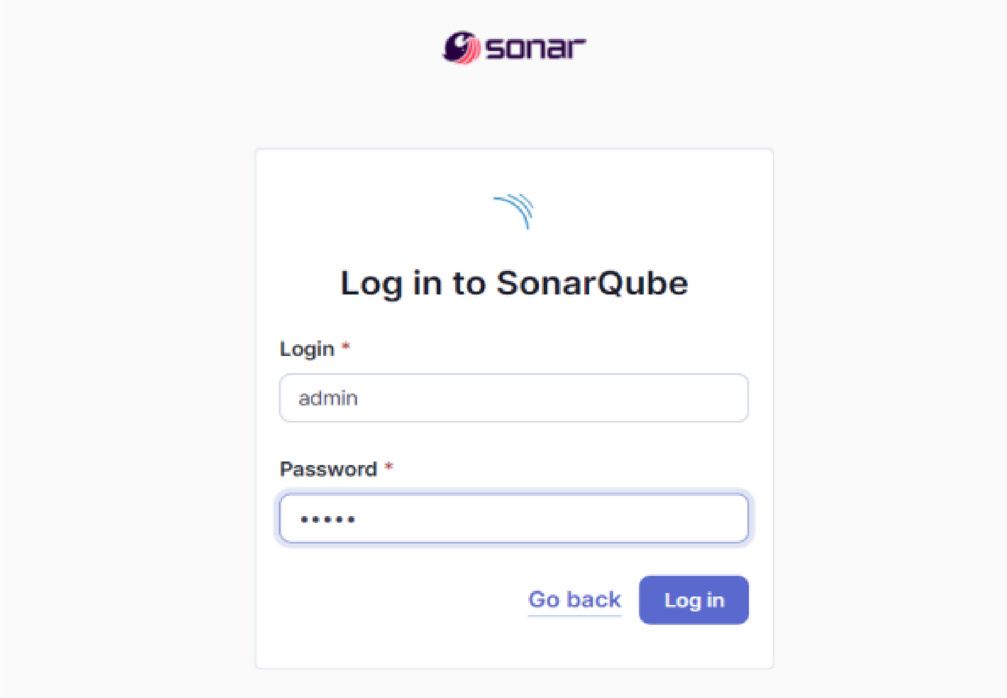
Step-2: Run SonarQube in a Docker container using this command :- docker run -d --name sonarqube -e SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true -p 9000:9000 sonarqube:latest



```
Microsoft Windows [Version 10.0.19045.4894]
(c) Microsoft Corporation. All rights reserved.

C:\Users\sathe>docker run -d --name sonarqube -e SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true -p 9000:9000 sonarqube:latest
Unable to find image 'sonarqube:latest' locally
latest: Pulling from library/sonarqube
7478e0ac0f23: Pull complete
90a925ab929a: Pull complete
7d9a34308537: Pull complete
80338217a4ab: Pull complete
1a5fd5c7e184: Pull complete
7b87d6fa783d: Pull complete
bd819c9b5ead: Pull complete
4f4fb700ef54: Pull complete
Digest: sha256:72e9feec71242af83faf65f95a40d5e3bb2822a6c3b2cda8568790f3d31aecde
Status: Downloaded newer image for sonarqube:latest
d1b7b47a4a70192fe051c9725b9a5bd97c7b913c758e453638f899f114f48301
```

Step-3: Once the container is up and running, you can check the status of SonarQube at localhost port 9000. The login id is “admin” and the password is also “admin”.



Log in to SonarQube

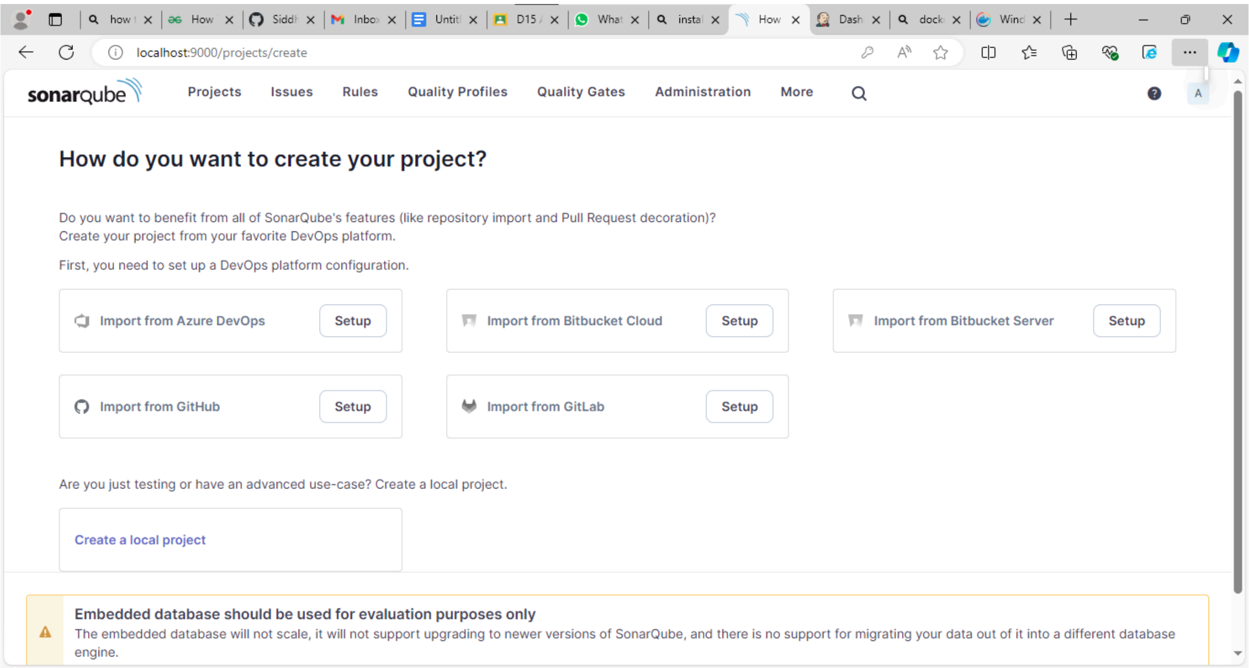
Login *

admin

Password *

•••••

Step-4: Create a local project in SonarQube with the name sonarqube



How do you want to create your project?

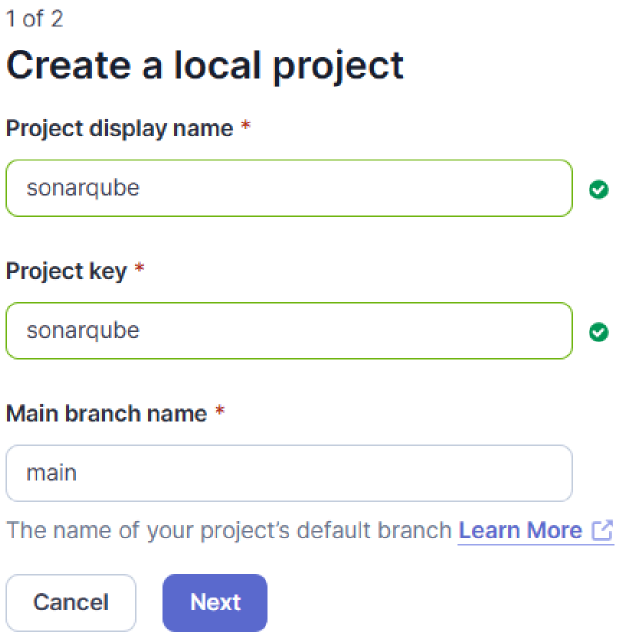
Do you want to benefit from all of SonarQube's features (like repository import and Pull Request decoration)?
Create your project from your favorite DevOps platform.

First, you need to set up a DevOps platform configuration.

Are you just testing or have an advanced use-case? Create a local project.

Embedded database should be used for evaluation purposes only

The embedded database will not scale, it will not support upgrading to newer versions of SonarQube, and there is no support for migrating your data out of it into a different database engine.



1 of 2

Create a local project

Project display name *

sonarqube ✓

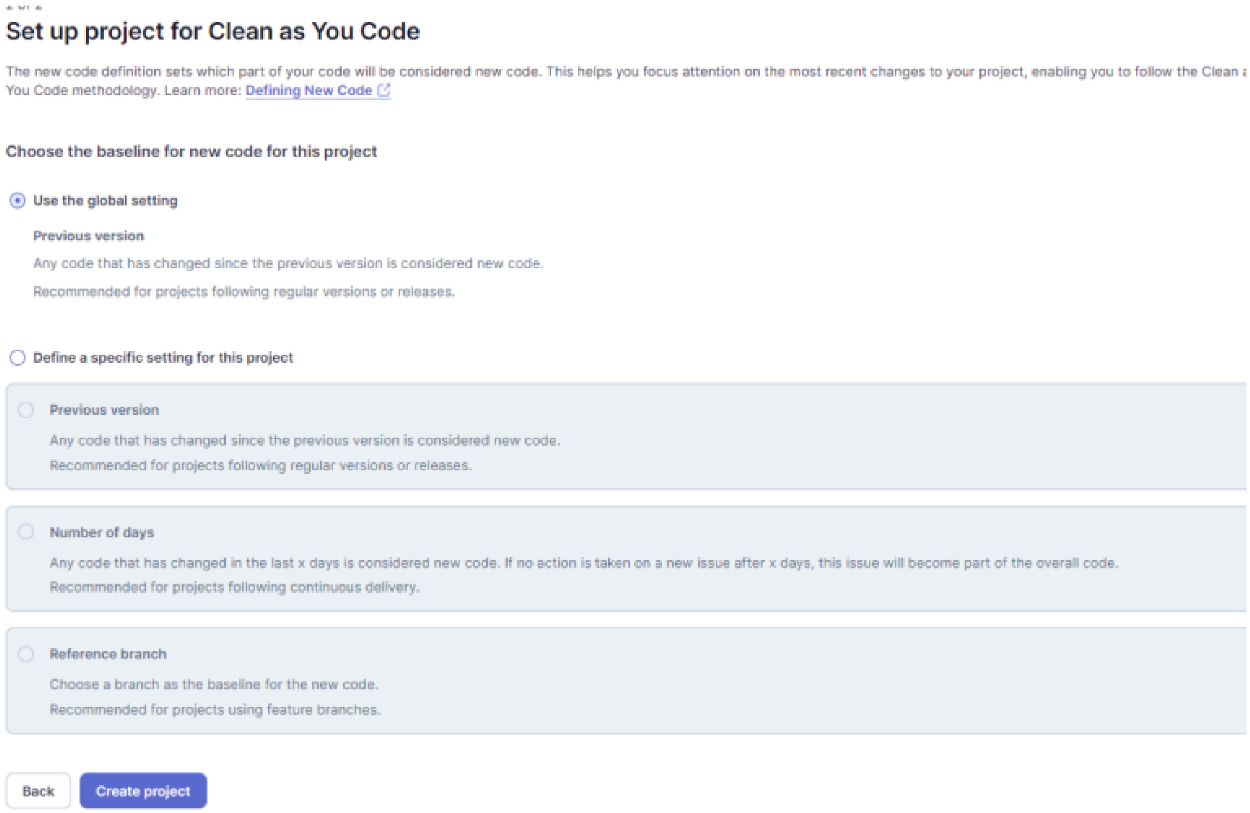
Project key *

sonarqube ✓

Main branch name *

main

The name of your project's default branch Learn More



Set up project for Clean as You Code

The new code definition sets which part of your code will be considered new code. This helps you focus attention on the most recent changes to your project, enabling you to follow the Clean a
You Code methodology. Learn more: Defining New Code

Choose the baseline for new code for this project

● Use the global setting

Previous version

Any code that has changed since the previous version is considered new code.

Recommended for projects following regular versions or releases.

○ Define a specific setting for this project

○ Previous version

Any code that has changed since the previous version is considered new code.

Recommended for projects following regular versions or releases.

○ Number of days

Any code that has changed in the last x days is considered new code. If no action is taken on a new issue after x days, this issue will become part of the overall code.

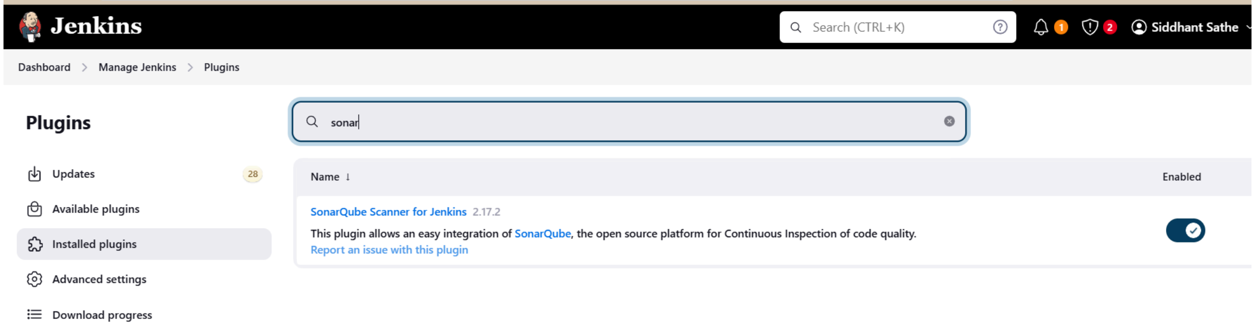
Recommended for projects following continuous delivery.

○ Reference branch

Choose a branch as the baseline for the new code.

Recommended for projects using feature branches.

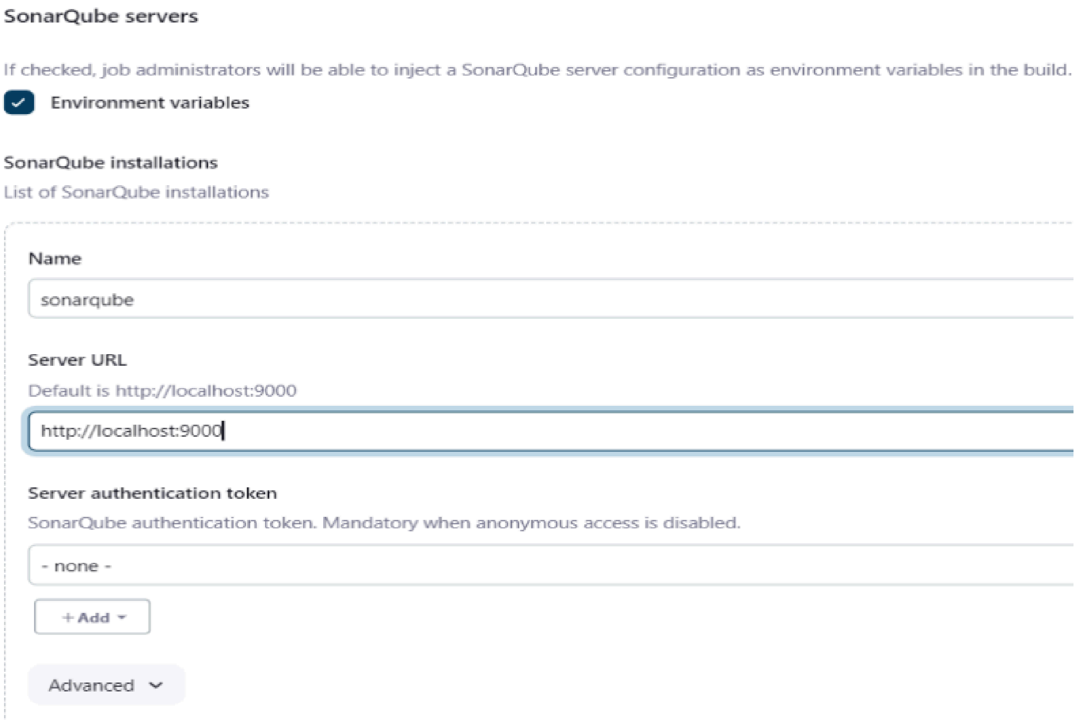
Step-5: Setup the project and come back to Jenkins Dashboard. Go to Manage Jenkins → Plugins and search for SonarQube Scanner in Available Plugins and install it.



sonar

Name ↓	Enabled
SonarQube Scanner for Jenkins 2.17.2 This plugin allows an easy integration of SonarQube, the open source platform for Continuous Inspection of code quality. Report an issue with this plugin	✓

Step-6: Under 'Manage Jenkins → System', look for SonarQube Servers and enter these details. Name : sonarqube, Server URL : http://localhost:9000



SonarQube servers

If checked, job administrators will be able to inject a SonarQube server configuration as environment variables in the build.

☑ Environment variables

SonarQube installations

List of SonarQube installations

Name

sonarqube

Server URL

Default is http://localhost:9000

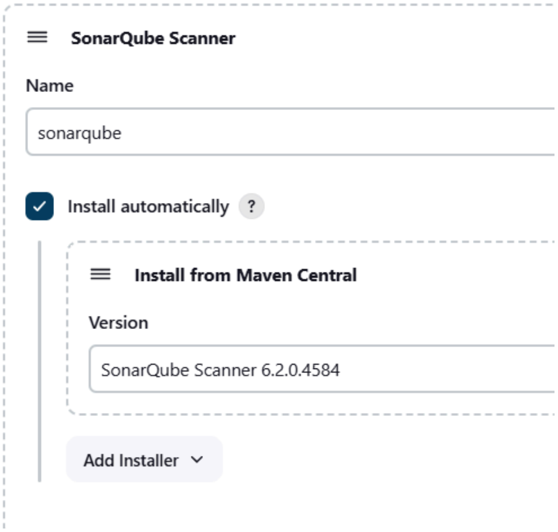
http://localhost:9000

Server authentication token

SonarQube authentication token. Mandatory when anonymous access is disabled.

- none -

Step-7: Search for SonarQube Scanner under Global Tool Configuration. Choose the latest configuration and choose Install automatically. Manage Jeknins → Tools → SonarQube Scanner Installation



SonarQube Scanner

Name

sonarqube

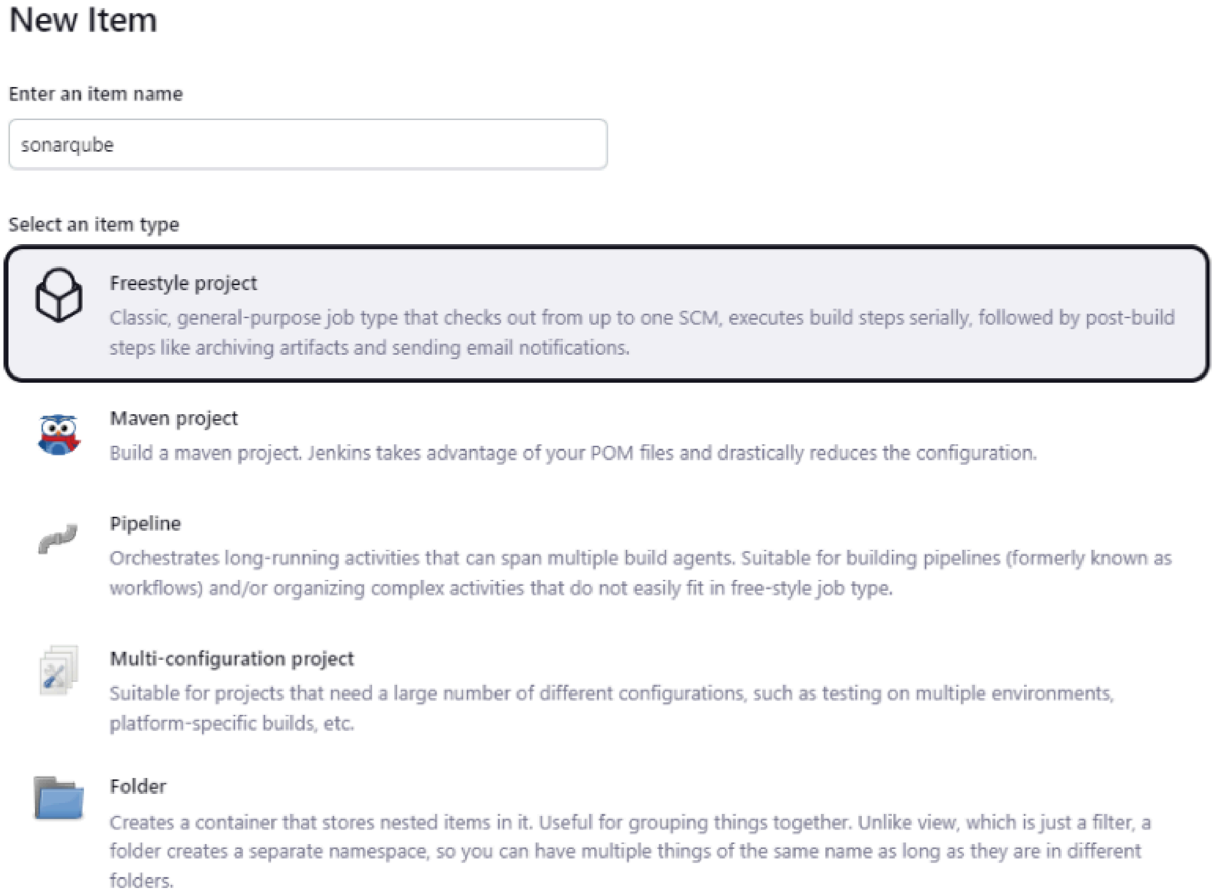
☑ Install automatically ?

Install from Maven Central

Version

SonarQube Scanner 6.2.0.4584

Step-8: After the configuration, create a New Item in Jenkins, choose a freestyle project named sonarqube.



New Item

Enter an item name

sonarqube

Select an item type

Freestyle project
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

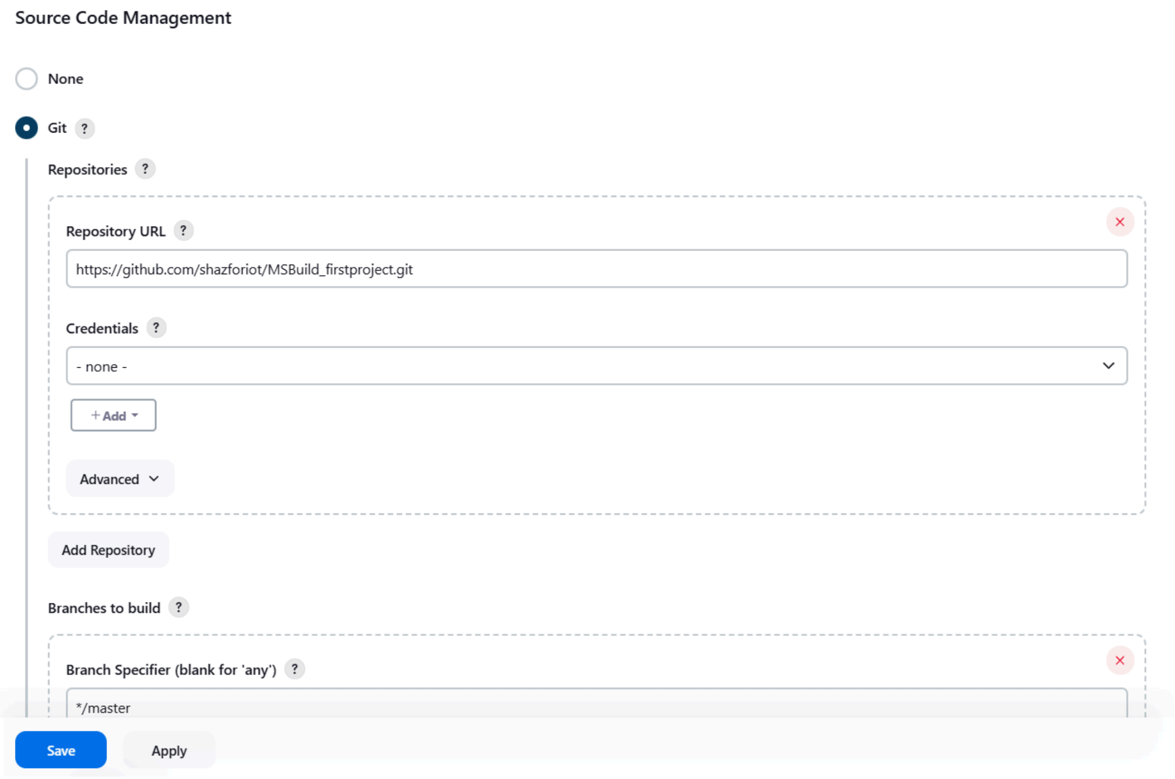
Maven project
Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

Step-9: Choose this GitHub repository in Source Code Management. https://github.com/shazforiot/MSBuild_firstproject.git . It is a sample hello-world project with no vulnerabilities and issues, just to test the integration.



Source Code Management

○ None

● Git ?

Repositories ?

Repository URL ?

https://github.com/shazforiot/MSBuild_firstproject.git

Credentials ?

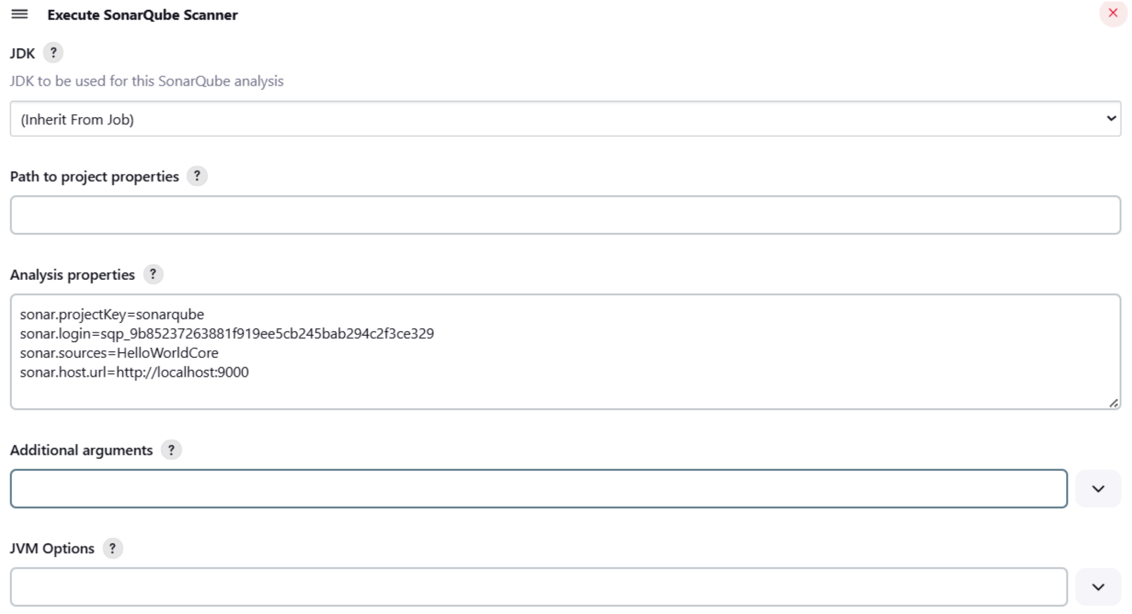
- none -

Branches to build ?

Branch Specifier (blank for 'any') ?

*/master

Step-10: Under Build-> Execute SonarQube Scanner, enter these Analysis Properties. Mention the SonarQube Project Key, Login, Password, Source path and Host URL.



Execute SonarQube Scanner

JDK ?

JDK to be used for this SonarQube analysis

(Inherit From Job)

Path to project properties ?

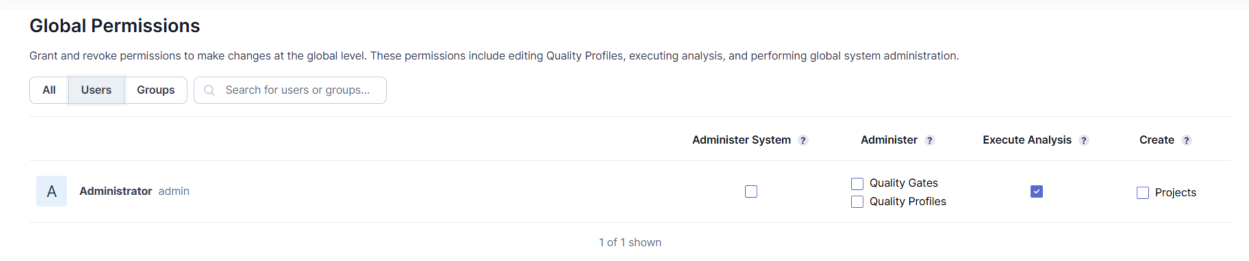
Analysis properties ?

```
sonar.projectKey=sonarqube
sonar.login=sqp_9b85237263881f919ee5cb245bab294c2f3ce329
sonar.sources=HelloWorldCore
sonar.host.url=http://localhost:9000
```

Additional arguments ?

JVM Options ?

Step-11: Go to http://localhost:9000/admin/permissions and allow Execute Permissions to the Admin user.



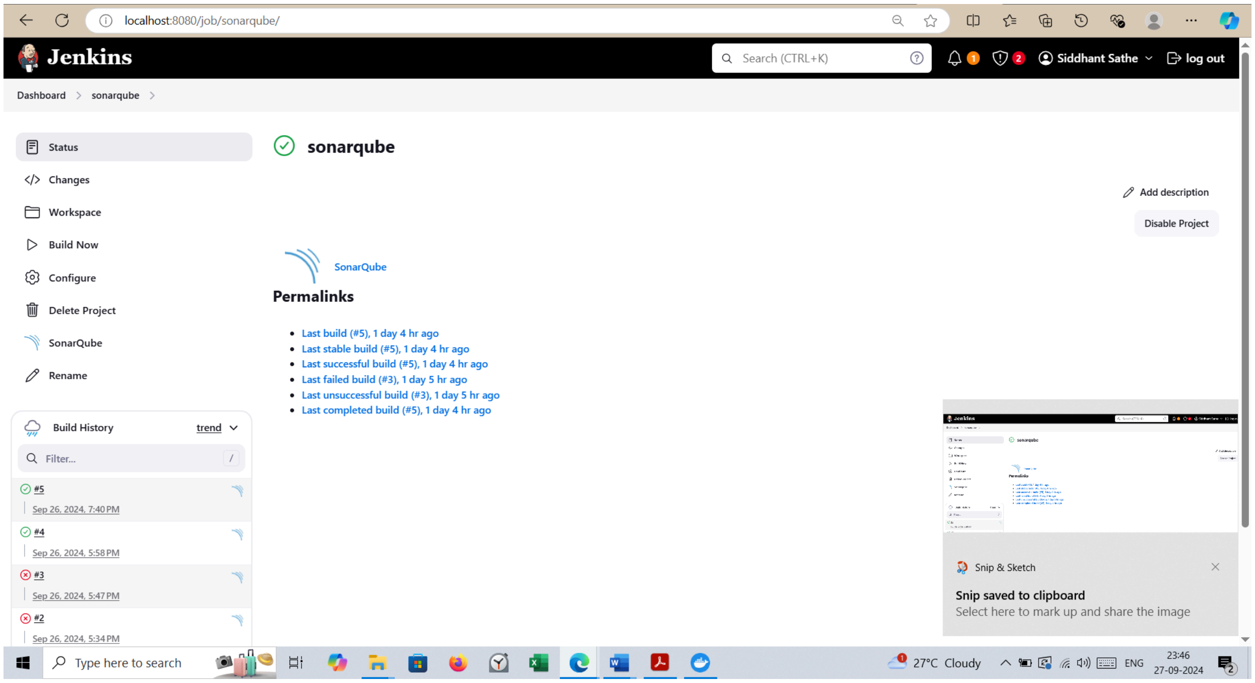
Global Permissions

Grant and revoke permissions to make changes at the global level. These permissions include editing Quality Profiles, executing analysis, and performing global system administration.

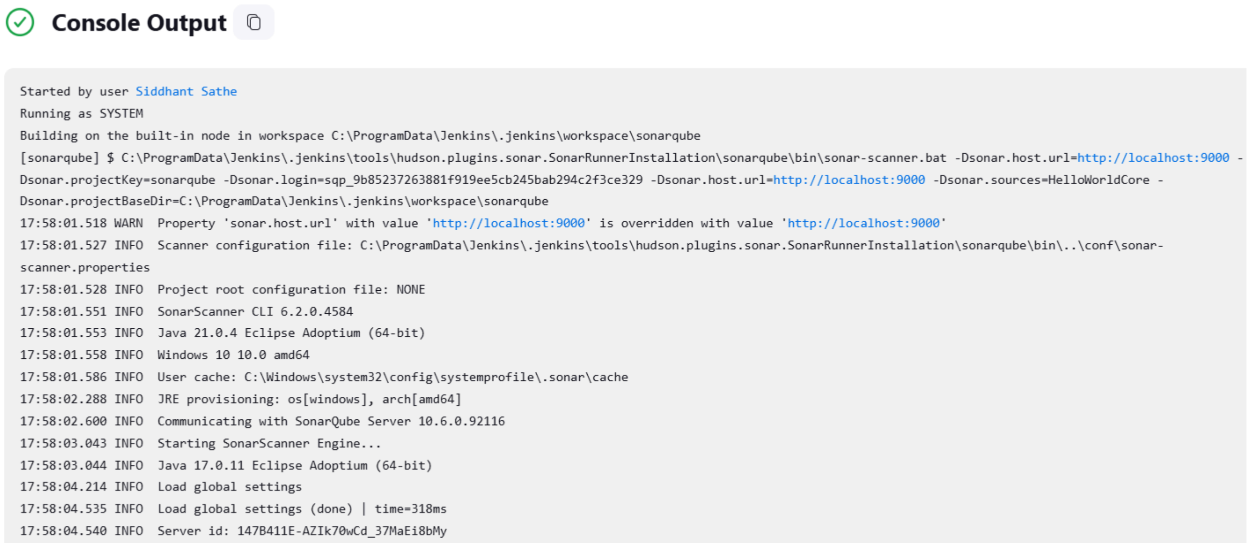
	Administer System ?	Administer ?	Execute Analysis ?	Create ?
A Administrator admin	□	□ Quality Gates □ Quality Profiles	☑	□ Projects

1 of 1 shown

Step-12: Run The Build and check the console output.

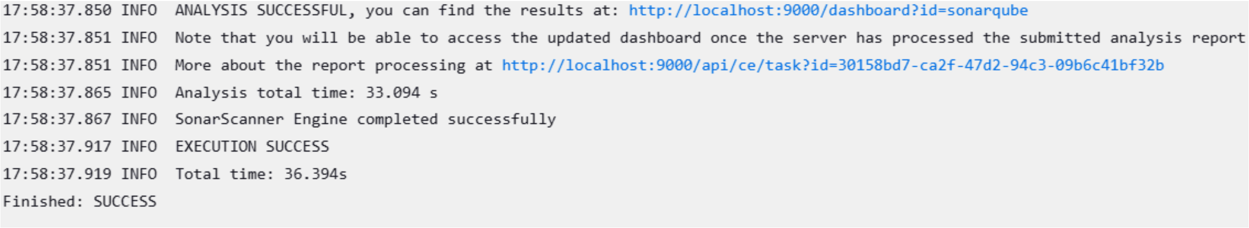


- Last build (#5), 1 day 4 hr ago
- Last stable build (#5), 1 day 4 hr ago
- Last successful build (#5), 1 day 4 hr ago
- Last failed build (#3), 1 day 5 hr ago
- Last unsuccessful build (#3), 1 day 5 hr ago
- Last completed build (#5), 1 day 4 hr ago



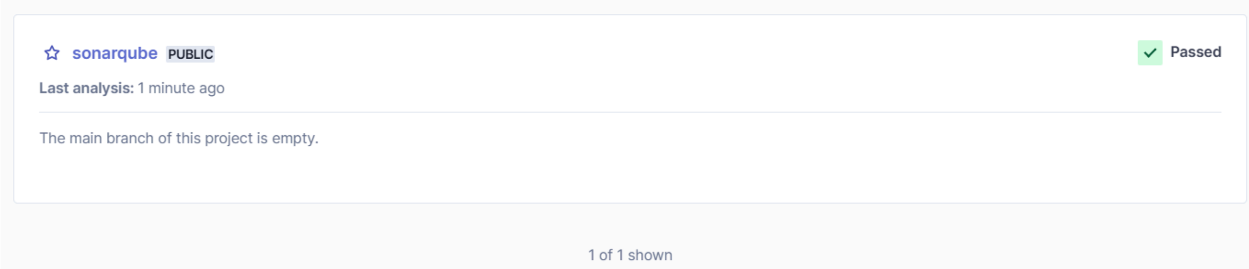
Console Output

```
Started by user Siddhant Sathe
Running as SYSTEM
Building on the built-in node in workspace C:\ProgramData\Jenkins\.jenkins\workspace\sonarqube
[sonarqube] $ C:\ProgramData\Jenkins\.jenkins\tools\hudson.plugins.sonar.SonarRunnerInstallation\sonarqube\bin\sonar-scanner.bat -Dsonar.host.url=http://localhost:9000 -
Dsonar.projectKey=sonarqube -Dsonar.login=sqp_9b85237263881f919ee5cb245bab294c2f3ce329 -Dsonar.host.url=http://localhost:9000 -Dsonar.sources=HelloWorldCore -
Dsonar.projectBaseDir=C:\ProgramData\Jenkins\.jenkins\workspace\sonarqube
17:58:01.518 WARN  Property 'sonar.host.url' with value 'http://localhost:9000' is overridden with value 'http://localhost:9000'
17:58:01.527 INFO  Scanner configuration file: C:\ProgramData\Jenkins\.jenkins\tools\hudson.plugins.sonar.SonarRunnerInstallation\sonarqube\bin\..\conf\sonar-
scanner.properties
17:58:01.528 INFO  Project root configuration file: NONE
17:58:01.551 INFO  SonarScanner CLI 6.2.0.4584
17:58:01.553 INFO  Java 21.0.4 Eclipse Adoptium (64-bit)
17:58:01.558 INFO  Windows 10 10.0 amd64
17:58:01.586 INFO  User cache: C:\Windows\system32\config\systemprofile\.sonar\cache
17:58:02.288 INFO  JRE provisioning: os[windows], arch[amd64]
17:58:02.600 INFO  Communicating with SonarQube Server 10.6.0.92116
17:58:03.043 INFO  Starting SonarScanner Engine...
17:58:03.044 INFO  Java 17.0.11 Eclipse Adoptium (64-bit)
17:58:04.214 INFO  Load global settings
17:58:04.535 INFO  Load global settings (done) | time=318ms
17:58:04.540 INFO  Server id: 147B411E-AZIk70wCd_37MaEi8bMy
```



```
17:58:37.850 INFO  ANALYSIS SUCCESSFUL, you can find the results at: http://localhost:9000/dashboard?id=sonarqube
17:58:37.851 INFO  Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report
17:58:37.851 INFO  More about the report processing at http://localhost:9000/api/ce/task?id=30158bd7-ca2f-47d2-94c3-09b6c41bf32b
17:58:37.865 INFO  Analysis total time: 33.094 s
17:58:37.867 INFO  SonarScanner Engine completed successfully
17:58:37.917 INFO  EXECUTION SUCCESS
17:58:37.919 INFO  Total time: 36.394s
Finished: SUCCESS
```

Step-13: Once the build is complete, check the project in SonarQube.

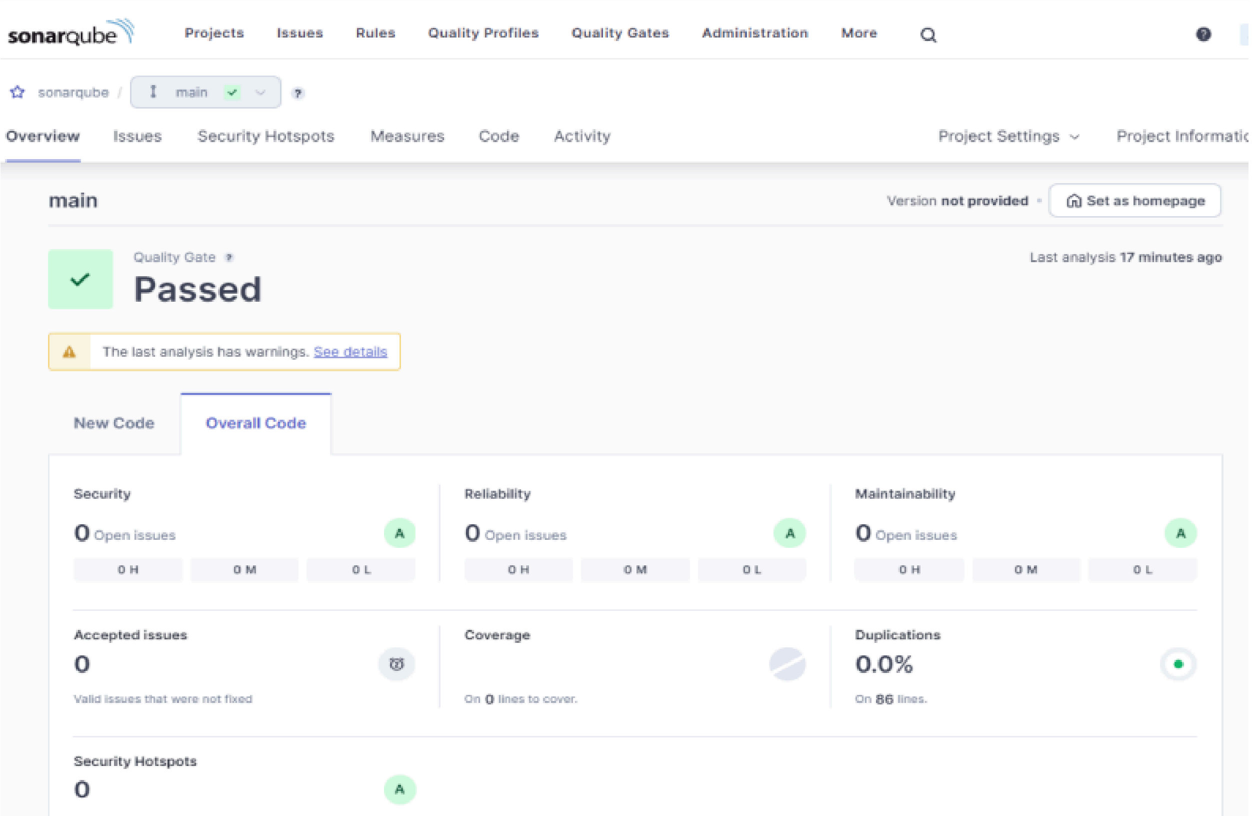


☆ sonarqube PUBLIC ✓ Passed

Last analysis: 1 minute ago

The main branch of this project is empty.

1 of 1 shown



main

Version **not provided**

Quality Gate

Passed

Last analysis **17 minutes ago**

The last analysis has warnings. See details

Security: 0 Open issues A — 0 H, 0 M, 0 L

Reliability: 0 Open issues A — 0 H, 0 M, 0 L

Maintainability: 0 Open issues A — 0 H, 0 M, 0 L

Accepted issues: 0 — Valid issues that were not fixed

Coverage — On **0** lines to cover.

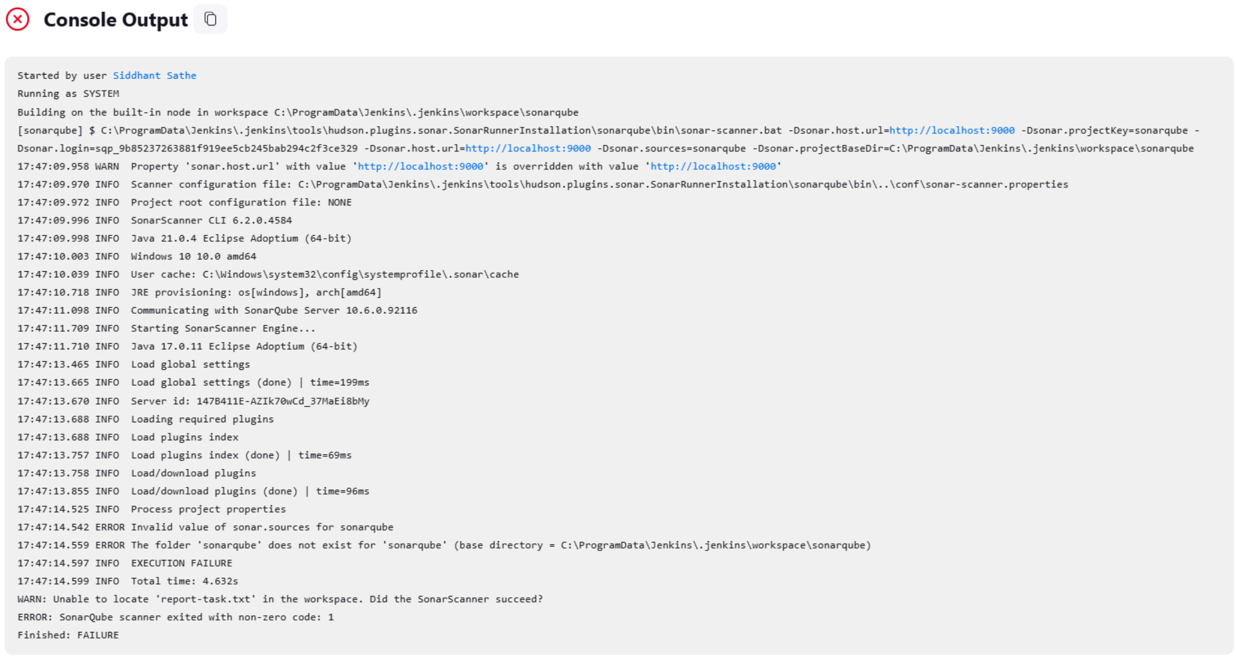
Duplications: 0.0% — On **86** lines.

Security Hotspots: 0 A

Error:

Build failed due to missing sonar source while configurations

Overcame by adding correct path to sonar.source



```
Started by user Siddhant Sathe
Running as SYSTEM
Building on the built-in node in workspace C:\ProgramData\Jenkins\.jenkins\workspace\sonarqube
[sonarqube] $ C:\ProgramData\Jenkins\.jenkins\tools\hudson.plugins.sonar.SonarRunnerInstallation\sonarqube\bin\sonar-scanner.bat -Dsonar.host.url=http://localhost:9000 -Dsonar.projectKey=sonarqube -
Dsonar.login=sqp_9b85237263881f919ee5cb245bab294c2f3ce329 -Dsonar.host.url=http://localhost:9000 -Dsonar.sources=sonarqube -Dsonar.projectBaseDir=C:\ProgramData\Jenkins\.jenkins\workspace\sonarqube
17:47:09.958 WARN  Property 'sonar.host.url' with value 'http://localhost:9000' is overridden with value 'http://localhost:9000'
17:47:09.970 INFO  Scanner configuration file: C:\ProgramData\Jenkins\.jenkins\tools\hudson.plugins.sonar.SonarRunnerInstallation\sonarqube\bin\..\conf\sonar-scanner.properties
17:47:09.972 INFO  Project root configuration file: NONE
17:47:09.996 INFO  SonarScanner CLI 6.2.0.4584
17:47:09.998 INFO  Java 21.0.4 Eclipse Adoptium (64-bit)
17:47:10.003 INFO  Windows 10 10.0 amd64
17:47:10.039 INFO  User cache: C:\Windows\system32\config\systemprofile\.sonar\cache
17:47:10.718 INFO  JRE provisioning: os[windows], arch[amd64]
17:47:11.098 INFO  Communicating with SonarQube Server 10.6.0.92116
17:47:11.709 INFO  Starting SonarScanner Engine...
17:47:11.710 INFO  Java 17.0.11 Eclipse Adoptium (64-bit)
17:47:13.465 INFO  Load global settings
17:47:13.665 INFO  Load global settings (done) | time=199ms
17:47:13.670 INFO  Server id: 147B411E-AZIk70wCd_37MaEi8bMy
17:47:13.688 INFO  Loading required plugins
17:47:13.688 INFO  Load plugins index
17:47:13.757 INFO  Load plugins index (done) | time=69ms
17:47:13.758 INFO  Load/download plugins
17:47:13.855 INFO  Load/download plugins (done) | time=96ms
17:47:14.525 INFO  Process project properties
17:47:14.542 ERROR Invalid value of sonar.sources for sonarqube
17:47:14.559 ERROR The folder 'sonarqube' does not exist for 'sonarqube' (base directory = C:\ProgramData\Jenkins\.jenkins\workspace\sonarqube)
17:47:14.597 INFO  EXECUTION FAILURE
17:47:14.599 INFO  Total time: 4.632s
WARN: Unable to locate 'report-task.txt' in the workspace. Did the SonarScanner succeed?
ERROR: SonarQube scanner exited with non-zero code: 1
Finished: FAILURE
```