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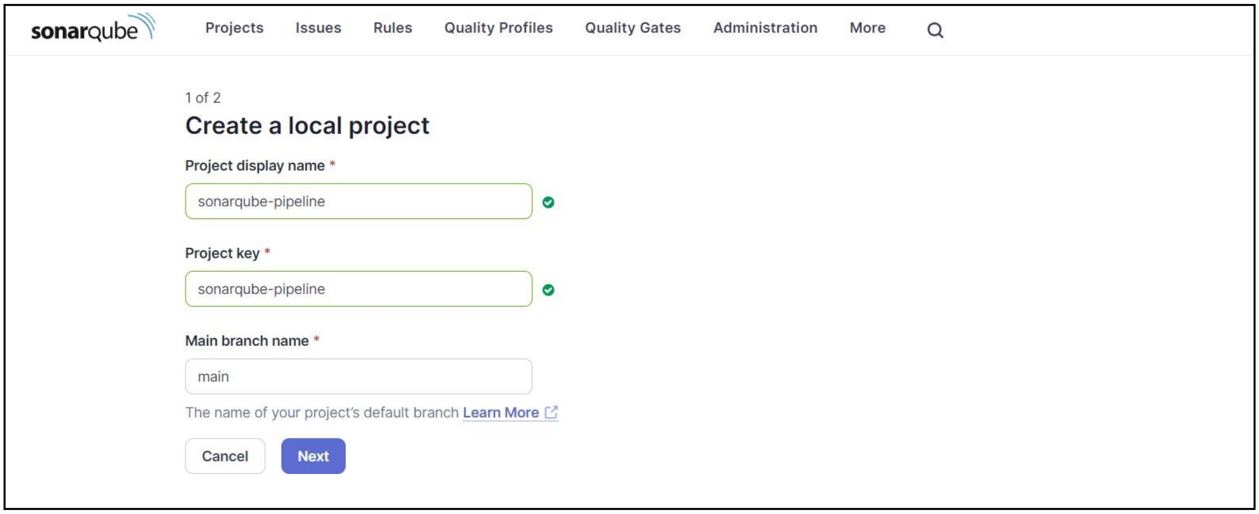
Experiment 8

Aim: Create a Jenkins CICD Pipeline with SonarQube / GitLab Integration to perform a static analysis of the code to detect bugs, code smells, and security vulnerabilities on a sample Web / Java / Python application.

Step 1: Log in to sonarqube portal and create a local project.



1 of 2

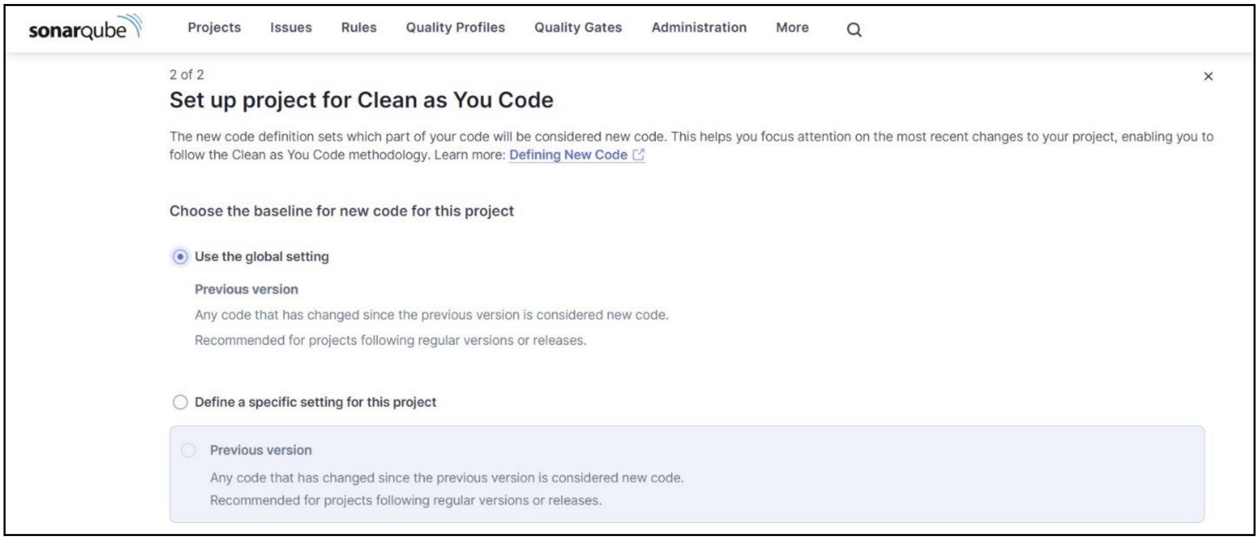
Create a local project

Project display name *: sonarqube-pipeline

Project key *: sonarqube-pipeline

Main branch name *: main

The name of your project's default branch Learn More



2 of 2

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 as 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.

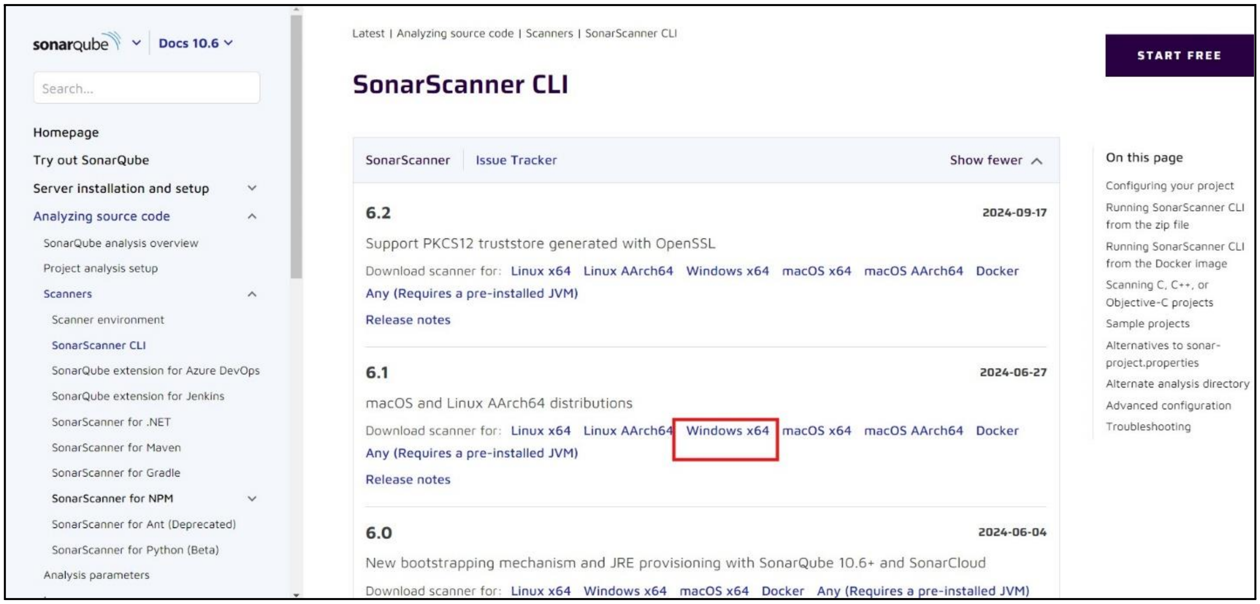
○ Define a specific setting for this project

○ Previous version

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

Recommended for projects following regular versions or releases.

Step 2: Go to download_sonarscanner to download sonar scanner


sonarqube
Docs 10.6
Search...
Homepage
Try out SonarQube
Server installation and setup
Analyzing source code
SonarQube analysis overview
Project analysis setup
Scanners
Scanner environment
SonarScanner CLI
SonarQube extension for Azure DevOps
SonarQube extension for Jenkins
SonarScanner for .NET
SonarScanner for Maven
SonarScanner for Gradle
SonarScanner for NPM
SonarScanner for Ant (Deprecated)
SonarScanner for Python (Beta)
Analysis parameters
START FREE
On this page
Configuring your project
Running SonarScanner CLI from the zip file
Running SonarScanner CLI from the Docker image
Scanning C, C++, or Objective-C projects
Sample projects
Alternatives to sonar-project.properties
Alternate analysis directory
Advanced configuration
Troubleshooting

Latest | Analyzing source code | Scanners | SonarScanner CLI

SonarScanner CLI

SonarScanner | Issue Tracker | Show fewer

6.2 2024-09-17

Support PKCS12 truststore generated with OpenSSL

Download scanner for: Linux x64 Linux AArch64 Windows x64 macOS x64 macOS AArch64 Docker Any (Requires a pre-installed JVM)

Release notes

6.1 2024-06-27

macOS and Linux AArch64 distributions

Download scanner for: Linux x64 Linux AArch64 Windows x64 macOS x64 macOS AArch64 Docker Any (Requires a pre-installed JVM)

Release notes

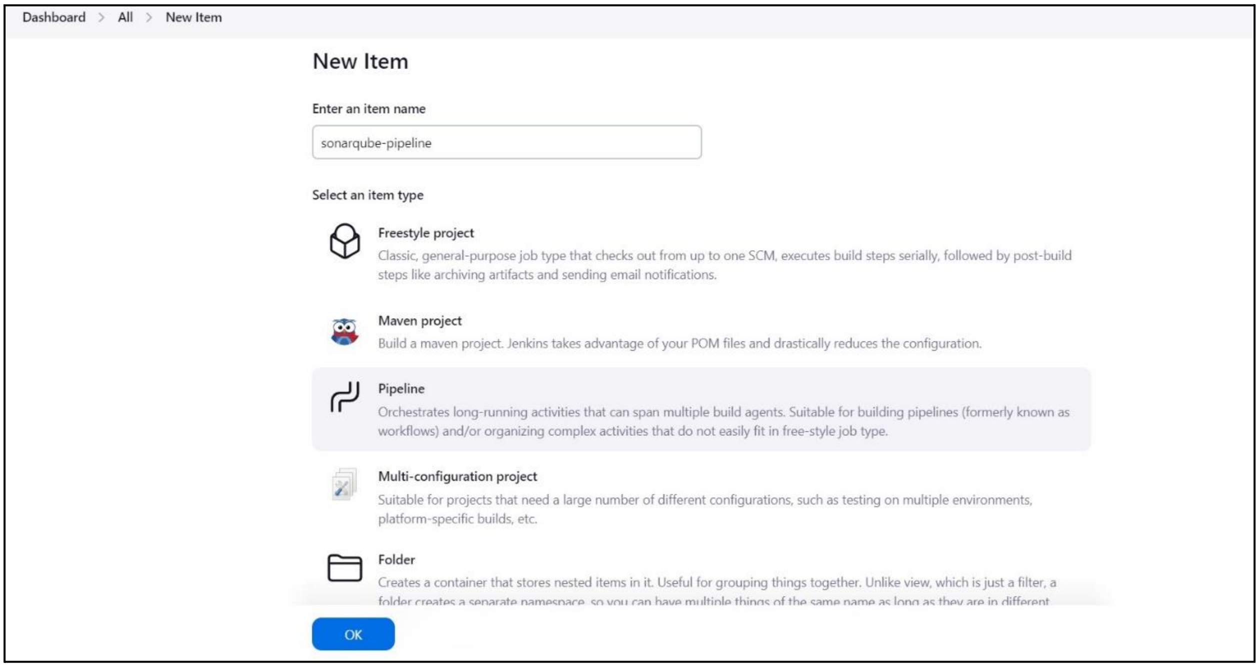
6.0 2024-06-04

New bootstrapping mechanism and JRE provisioning with SonarQube 10.6+ and SonarCloud

Download scanner for: Linux x64 Windows x64 macOS x64 Docker Any (Requires a pre-installed JVM)

After the download is complete, extract the file and copy the path to bin folder
Go to environment variables, system variables and click on path
Add a new path, paste the path copied earlier

Step 3: Create a New Item in Jenkins, choose Pipeline.



Dashboard > All > New Item

New Item

Enter an item name

sonarqube-pipeline

Select an item type

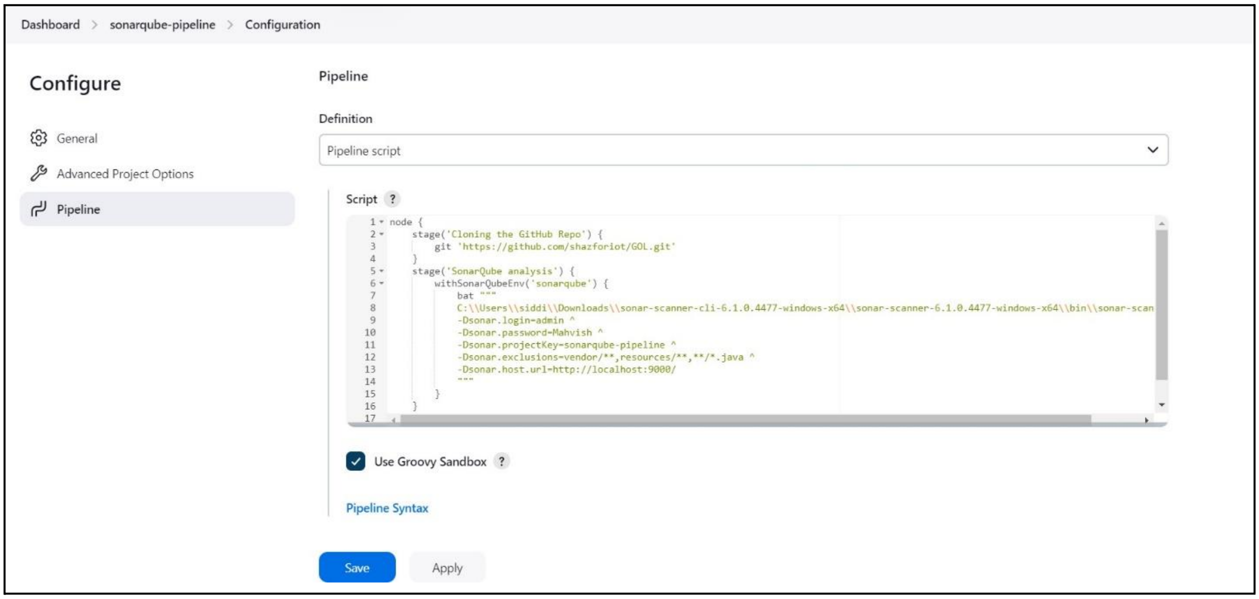
Freestyle project
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

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



Dashboard > sonarqube-pipeline > Configuration

Configure

Pipeline

Definition

Pipeline script

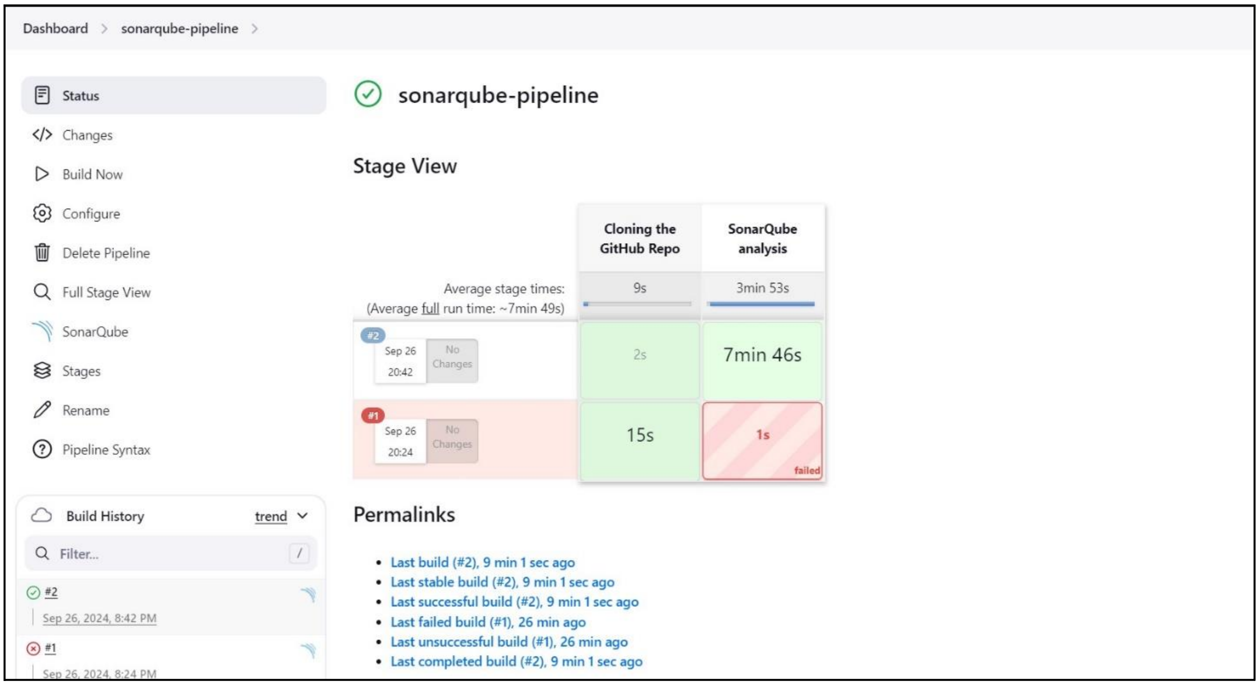
Script

```
node {
    stage('Cloning the GitHub Repo') {
        git 'https://github.com/shazforiot/GOL.git'
    }
    stage('SonarQube analysis') {
        withSonarQubeEnv('sonarqube') {
            bat """
            C:\\Users\\siddi\\Downloads\\sonar-scanner-cli-6.1.0.4477-windows-x64\\sonar-scanner-6.1.0.4477-windows-x64\\bin\\sonar-scan
            -Dsonar.login=admin ^
            -Dsonar.password=Mahvish ^
            -Dsonar.projectKey=sonarqube-pipeline ^
            -Dsonar.exclusions=vendor/**,resources/**,**/*.java ^
            -Dsonar.host.url=http://localhost:9000/
            """
        }
    }
```

☑ Use Groovy Sandbox

Pipeline Syntax

Step 4: Save the pipeline and build it.



sonarqube-pipeline

Stage View

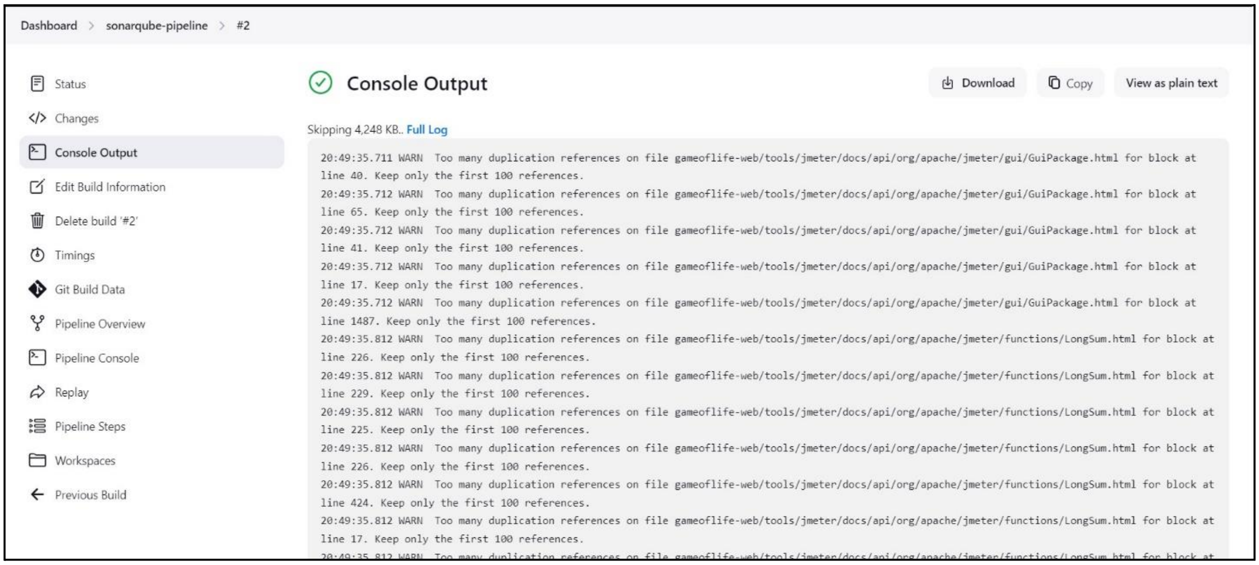
	Cloning the GitHub Repo	SonarQube analysis
Average stage times: (Average full run time: ~7min 49s)	9s	3min 53s
#2 Sep 26 20:42 No Changes	2s	7min 46s
#1 Sep 26 20:24 No Changes	15s	1s failed

#2
Sep 26, 2024, 8:42 PM
#1
Sep 26, 2024, 8:24 PM

Permalinks

- Last build (#2), 9 min 1 sec ago
- Last stable build (#2), 9 min 1 sec ago
- Last successful build (#2), 9 min 1 sec ago
- Last failed build (#1), 26 min ago
- Last unsuccessful build (#1), 26 min ago
- Last completed build (#2), 9 min 1 sec ago

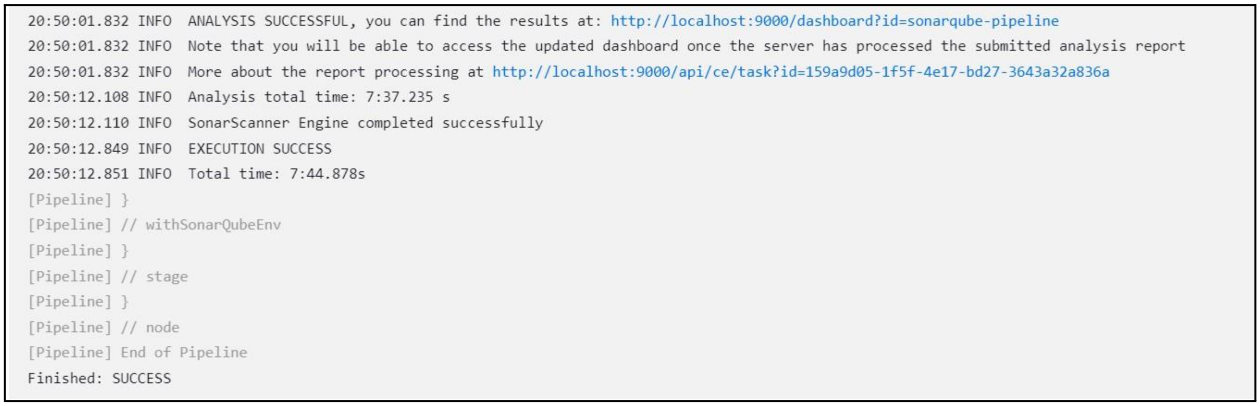
Console output:



Console Output

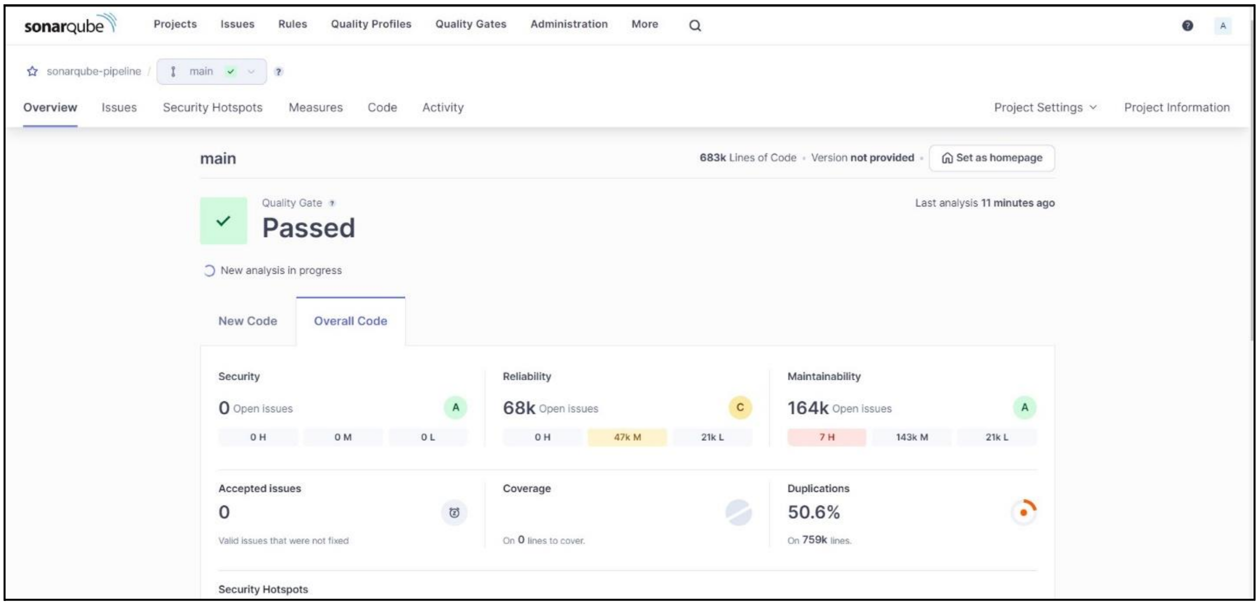
Skipping 4,248 KB.. Full Log

```
20:49:35.711 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/gui/GuiPackage.html for block at
line 40. Keep only the first 100 references.
20:49:35.712 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/gui/GuiPackage.html for block at
line 65. Keep only the first 100 references.
20:49:35.712 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/gui/GuiPackage.html for block at
line 41. Keep only the first 100 references.
20:49:35.712 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/gui/GuiPackage.html for block at
line 17. Keep only the first 100 references.
20:49:35.712 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/gui/GuiPackage.html for block at
line 1487. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
line 226. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
line 229. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
line 225. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
line 226. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
line 424. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
line 17. Keep only the first 100 references.
20:49:35.812 WARN  Too many duplication references on file gameoflife-web/tools/jmeter/docs/api/org/apache/jmeter/functions/LongSum.html for block at
```



```
20:50:01.832 INFO  ANALYSIS SUCCESSFUL, you can find the results at: http://localhost:9000/dashboard?id=sonarqube-pipeline
20:50:01.832 INFO  Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report
20:50:01.832 INFO  More about the report processing at http://localhost:9000/api/ce/task?id=159a9d05-1f5f-4e17-bd27-3643a32a836a
20:50:12.108 INFO  Analysis total time: 7:37.235 s
20:50:12.110 INFO  SonarScanner Engine completed successfully
20:50:12.849 INFO  EXECUTION SUCCESS
20:50:12.851 INFO  Total time: 7:44.878s
[Pipeline] }
[Pipeline] // withSonarQubeEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Step 5: After that, check the project in SonarQube



main

683k Lines of Code • Version not provided •

Quality Gate

Passed

Last analysis 11 minutes ago

New analysis in progress

Security
0 Open issues A
0 H 0 M 0 L

Reliability
68k Open issues C
0 H 47k M 21k L

Maintainability
164k Open issues A
7 H 143k M 21k L

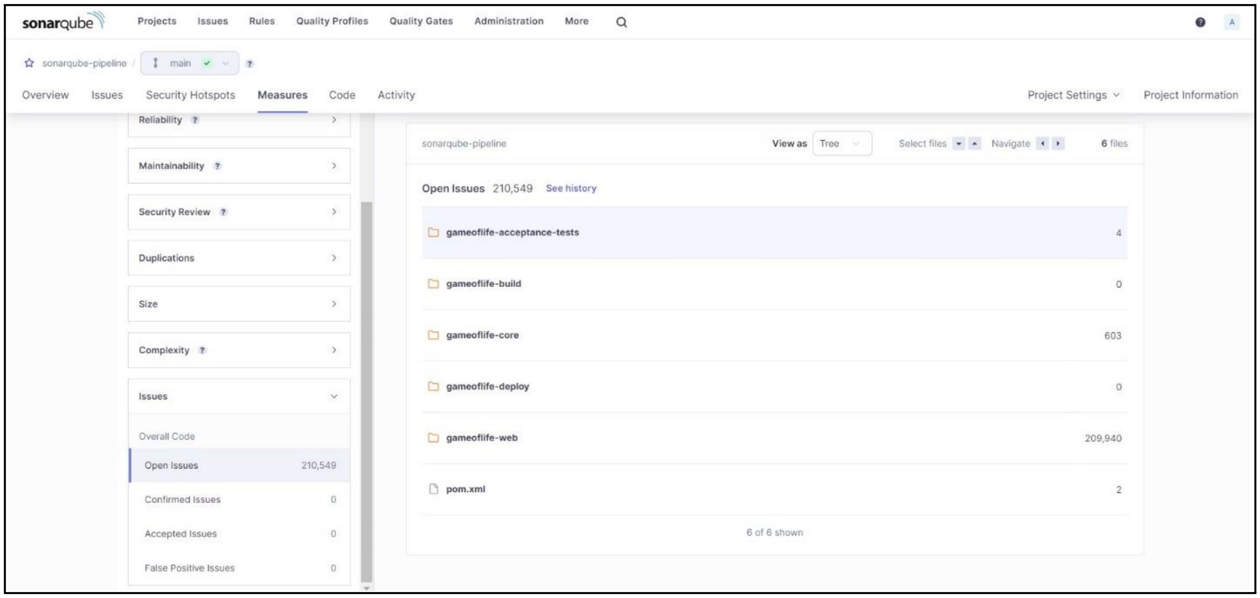
Accepted issues
0
Valid issues that were not fixed

Coverage
On 0 lines to cover.

Duplications
50.6%
On 759k lines.

Security Hotspots

Under different tabs, check all different issues with the code.



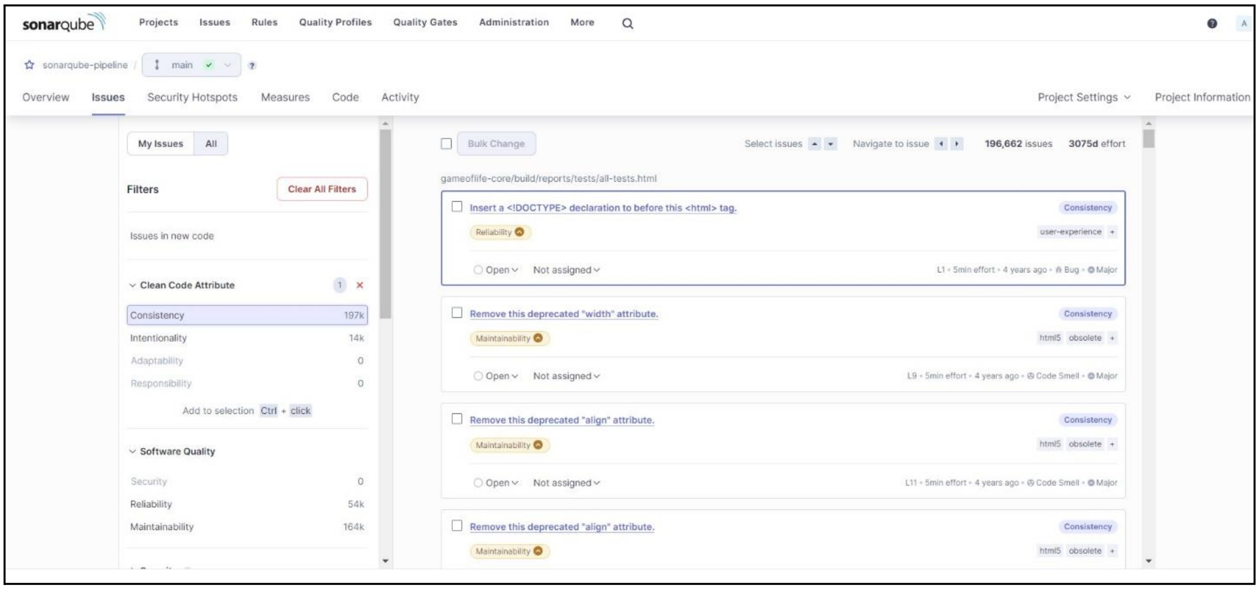
Open Issues	210,549
Confirmed Issues	0
Accepted Issues	0
False Positive Issues	0

sonarqube-pipeline View as Tree Select files Navigate 6 files

Open Issues 210,549 See history

gameoflife-acceptance-tests	4
gameoflife-build	0
gameoflife-core	603
gameoflife-deploy	0
gameoflife-web	209,940
pom.xml	2

6 of 6 shown



Clean Code Attribute 1

Consistency	197k
Intentionality	14k
Adaptability	0
Responsibility	0

Software Quality

Security	0
Reliability	54k
Maintainability	164k

Select issues Navigate to issue 196,662 issues 3075d effort

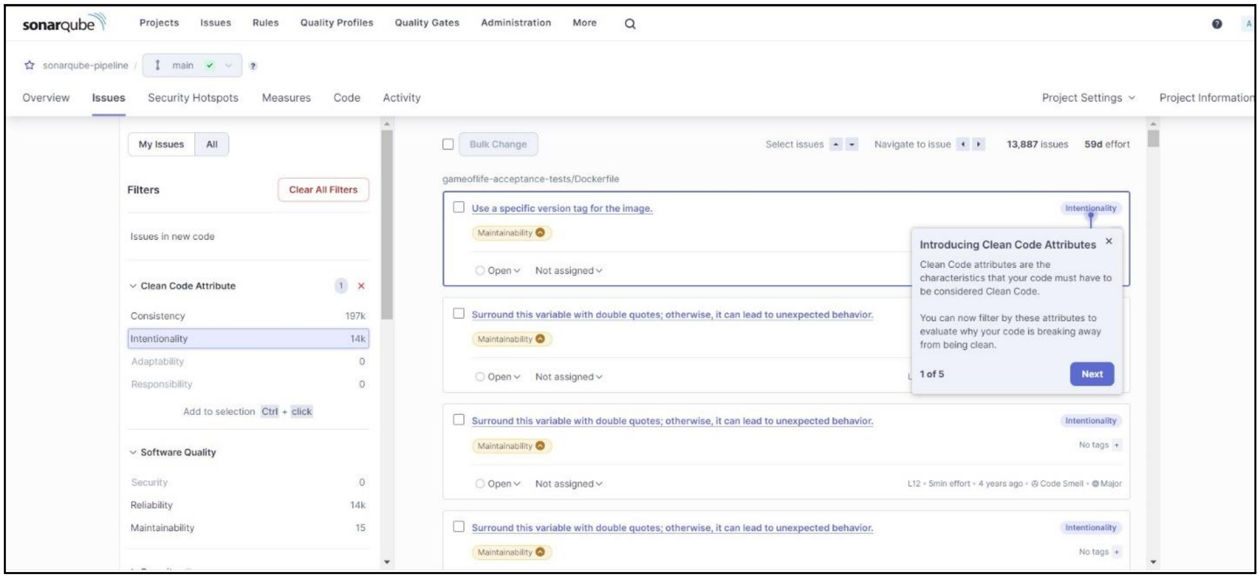
gameoflife-core/build/reports/tests/all-tests.html

□ Insert a <!DOCTYPE> declaration to before this <html> tag. Consistency
Reliability user-experience +
○ Open Not assigned L1 · 5min effort · 4 years ago · Bug · Major

□ Remove this deprecated "width" attribute. Consistency
Maintainability html5 obsolete +
○ Open Not assigned L9 · 5min effort · 4 years ago · Code Smell · Major

□ Remove this deprecated "align" attribute. Consistency
Maintainability html5 obsolete +
○ Open Not assigned L11 · 5min effort · 4 years ago · Code Smell · Major

□ Remove this deprecated "align" attribute. Consistency
Maintainability html5 obsolete +



13,887 issues 59d effort

Filters

Issues in new code

Clean Code Attribute 1

Consistency	197k
Intentionality	14k
Adaptability	0
Responsibility	0

Software Quality

Security	0
Reliability	14k
Maintainability	15

gameoflife-acceptance-tests/Dockerfile

□ Use a specific version tag for the image. — Intentionality — Maintainability — ○ Open — Not assigned

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. — Maintainability — ○ Open — Not assigned

Introducing Clean Code Attributes ×

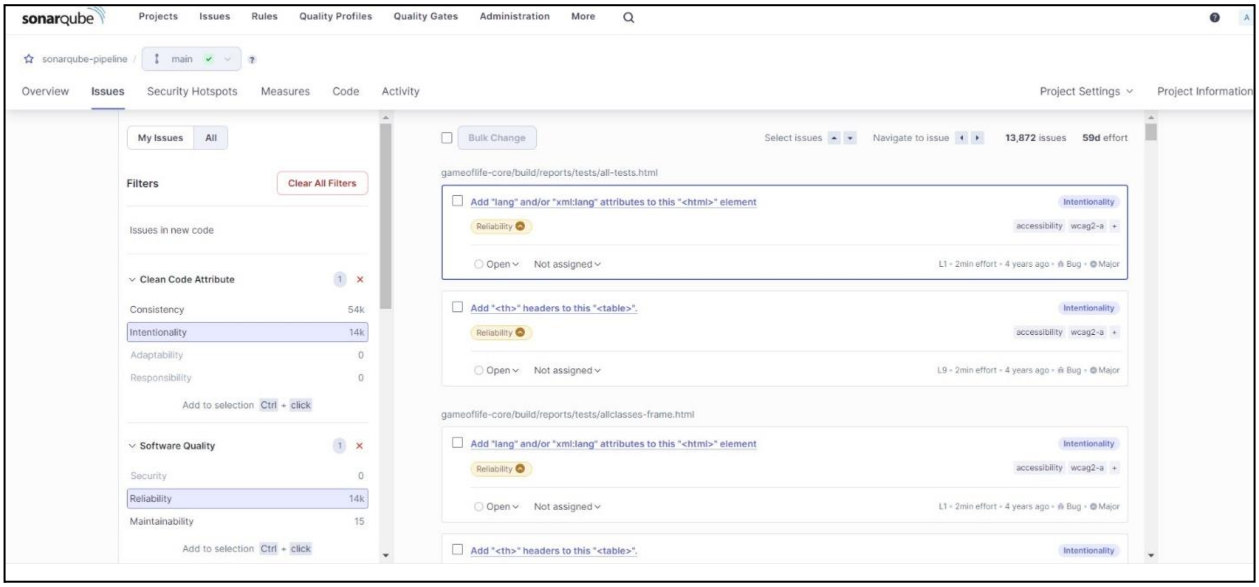
Clean Code attributes are the characteristics that your code must have to be considered Clean Code.

You can now filter by these attributes to evaluate why your code is breaking away from being clean.

1 of 5 Next

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. — Intentionality — Maintainability — No tags + — ○ Open — Not assigned — L12 • 5min effort • 4 years ago • Code Smell • Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. — Intentionality — Maintainability — No tags +



13,872 issues 59d effort

Filters

Issues in new code

Clean Code Attribute 1

Consistency	54k
Intentionality	14k
Adaptability	0
Responsibility	0

Software Quality 1

Security	0
Reliability	14k
Maintainability	15

gameoflife-core/build/reports/tests/all-tests.html

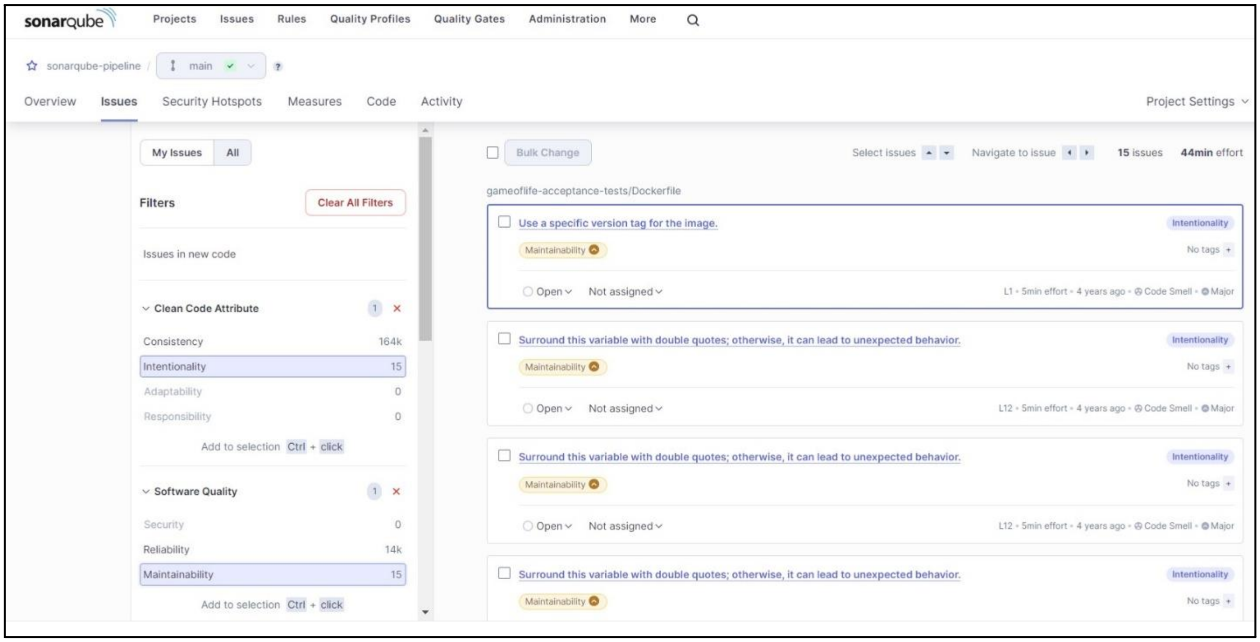
□ Add "lang" and/or "xml:lang" attributes to this "<html>" element — Intentionality — Reliability — accessibility wcag2-a + — ○ Open — Not assigned — L1 • 2min effort • 4 years ago • Bug • Major

□ Add "<th>" headers to this "<table>". — Intentionality — Reliability — accessibility wcag2-a + — ○ Open — Not assigned — L9 • 2min effort • 4 years ago • Bug • Major

gameoflife-core/build/reports/tests/allclasses-frame.html

□ Add "lang" and/or "xml:lang" attributes to this "<html>" element — Intentionality — Reliability — accessibility wcag2-a + — ○ Open — Not assigned — L1 • 2min effort • 4 years ago • Bug • Major

□ Add "<th>" headers to this "<table>". — Intentionality



sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration More

sonarqube-pipeline / main ?

Overview Issues Security Hotspots Measures Code Activity Project Settings

My Issues All

Filters Clear All Filters

Issues in new code

Clean Code Attribute 1 ✕

Consistency	164k
Intentionality	15
Adaptability	0
Responsibility	0

Add to selection Ctrl + click

Software Quality 1 ✕

Security	0
Reliability	14k
Maintainability	15

Add to selection Ctrl + click

□ Bulk Change Select issues Navigate to issue 15 issues 44min effort

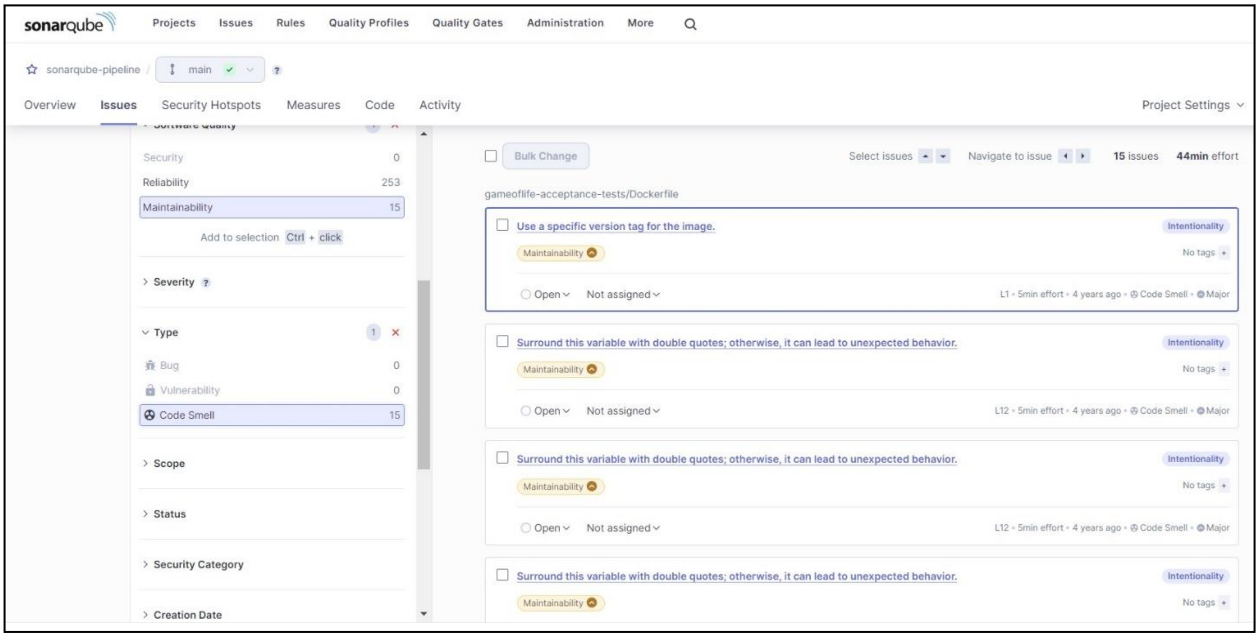
gameoflife-acceptance-tests/Dockerfile

□ Use a specific version tag for the image. Intentionality
Maintainability No tags +
○ Open Not assigned L1 · 5min effort · 4 years ago · Code Smell · Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. Intentionality
Maintainability No tags +
○ Open Not assigned L12 · 5min effort · 4 years ago · Code Smell · Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. Intentionality
Maintainability No tags +
○ Open Not assigned L12 · 5min effort · 4 years ago · Code Smell · Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. Intentionality
Maintainability No tags +



sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration More

sonarqube-pipeline / main ?

Overview Issues Security Hotspots Measures Code Activity Project Settings

Security	0
Reliability	253
Maintainability	15

Add to selection Ctrl + click

Severity ?

Type 1 ✕

Bug	0
Vulnerability	0
Code Smell	15

Scope

Status

Security Category

Creation Date

□ Bulk Change Select issues Navigate to issue 15 issues 44min effort

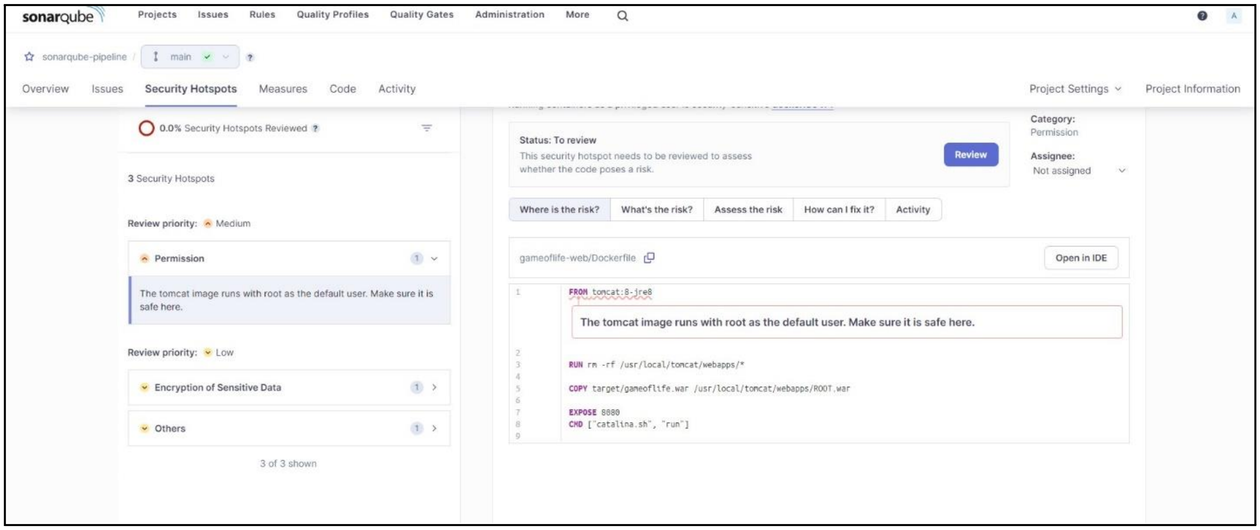
gameoflife-acceptance-tests/Dockerfile

□ Use a specific version tag for the image. Intentionality
Maintainability No tags +
○ Open Not assigned L1 · 5min effort · 4 years ago · Code Smell · Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. Intentionality
Maintainability No tags +
○ Open Not assigned L12 · 5min effort · 4 years ago · Code Smell · Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. Intentionality
Maintainability No tags +
○ Open Not assigned L12 · 5min effort · 4 years ago · Code Smell · Major

□ Surround this variable with double quotes; otherwise, it can lead to unexpected behavior. Intentionality
Maintainability No tags +



0.0% Security Hotspots Reviewed

3 Security Hotspots

Review priority: Medium

Permission	1
The tomcat image runs with root as the default user. Make sure it is safe here.	

Review priority: Low

Encryption of Sensitive Data	1
Others	1

3 of 3 shown

Status: To review

This security hotspot needs to be reviewed to assess whether the code poses a risk.

Category: Permission

Assignee: Not assigned

gameoflife-web/Dockerfile

```
FROM tomcat:8-jre8
```

The tomcat image runs with root as the default user. Make sure it is safe here.

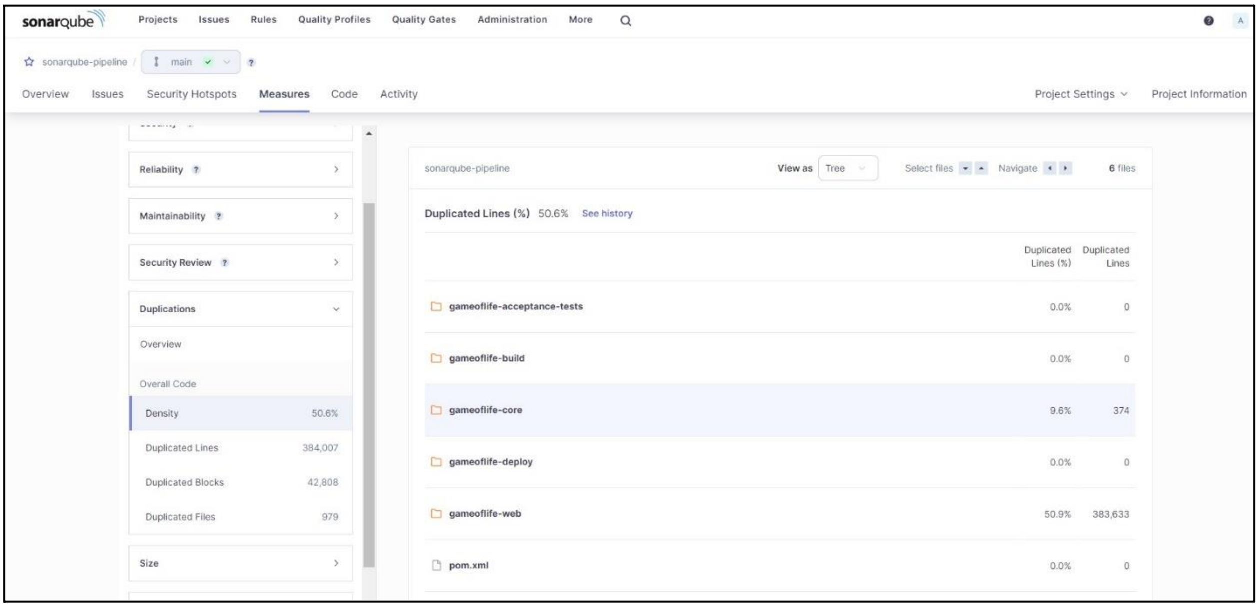
```

RUN rm -rf /usr/local/tomcat/webapps/*

COPY target/gameoflife.war /usr/local/tomcat/webapps/ROOT.war

EXPOSE 8080
CMD ["catalina.sh", "run"]

```

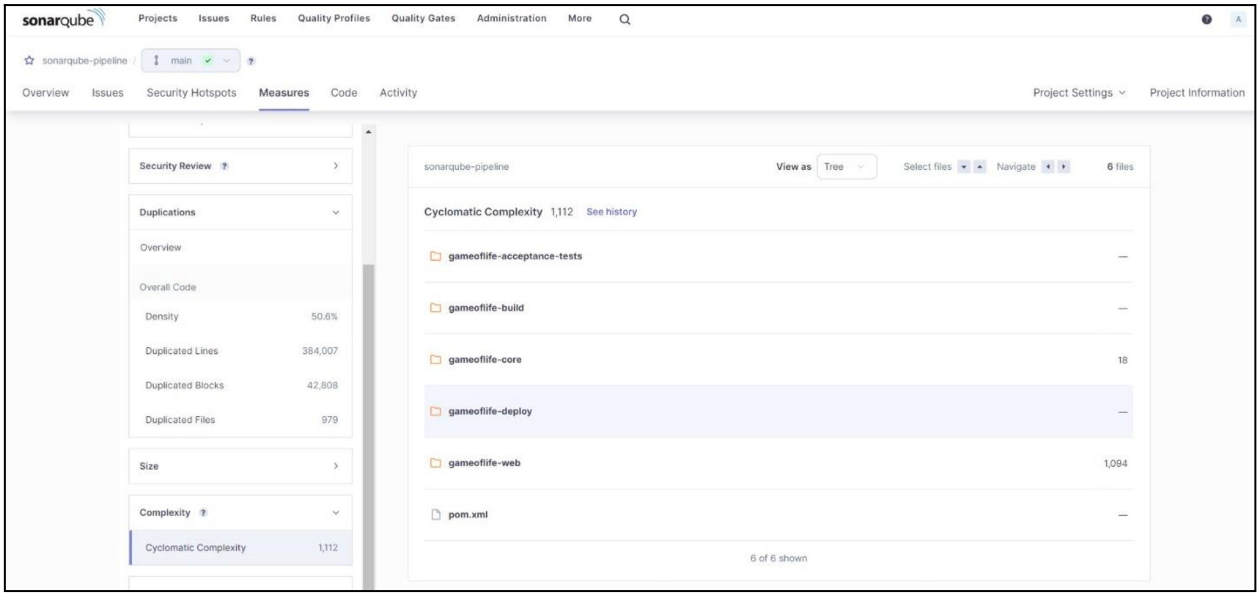


Overview	
Overall Code	
Density	50.6%
Duplicated Lines	384,007
Duplicated Blocks	42,808
Duplicated Files	979

sonarqube-pipeline — 6 files

Duplicated Lines (%) 50.6%

	Duplicated Lines (%)	Duplicated Lines
gameoflife-acceptance-tests	0.0%	0
gameoflife-build	0.0%	0
gameoflife-core	9.6%	374
gameoflife-deploy	0.0%	0
gameoflife-web	50.9%	383,633
pom.xml	0.0%	0



Duplications

Overview

Overall Code

Density	50.6%
Duplicated Lines	384,007
Duplicated Blocks	42,808
Duplicated Files	979

Complexity

Cyclomatic Complexity	1,112

sonarqube-pipeline — 6 files

Cyclomatic Complexity 1,112

gameoflife-acceptance-tests	—
gameoflife-build	—
gameoflife-core	18
gameoflife-deploy	—
gameoflife-web	1,094
pom.xml	—

6 of 6 shown