Prem-12118

Technical Assessment

11.04.2024

Code Quality and Design Principle's Assessment

I – Portion of Assessment (My Code Analysis)

1) **The Code tested by me from the trainer shared resources, The Code is about Vehicle Management System.**

The code, provided is about containing of bugs, smells and about some violations, and need to make code Analysis with the help of SonarQube code Quality tool.

STEP – 1:

```
WARNING: A terminally deprecated method in java.lang.System has been called
WARNING: System::setSecurityManager has been called by org.sonar.process.PluginSecurityManager (file:/D:/Tools/sonarqube-9.
ar)
WARNING: Please consider reporting this to the maintainers of org.sonar.process.PluginSecurityManager
WARNING: System::setSecurityManager will be removed in a future release
2024.04.11 09:38:02 INFO  app[][o.s.a.SchedulerImpl] Process[web] is up
2024.04.11 09:38:02 INFO  app[][o.s.a.ProcessLauncherImpl] Launch process[COMPUTE_ENGINE] from [D:\Tools\sonarqube-9.9.4.87
Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djava.io.tmpdir=D:\Tools\sonarqube-9.9.4.87374\temp -XX:-OmitStackTraceInFas
NAMED --add-exports=java.base/jdk.internal.ref=ALL-UNNAMED --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=java.bas
sun.nio.ch=ALL-UNNAMED --add-opens=java.management/sun.management=ALL-UNNAMED --add-opens=jdk.management/com.sun.management
 -Xmx512m -Xms128m -XX:+HeapDumpOnOutOfMemoryError -Dhttp.nonProxyHosts=localhost|127.*|[::1] -cp ./lib/sonar-application-9
\lib\jdbc\h2\h2-2.1.214.jar org.sonar.ce.app.CeServer D:\Tools\sonarqube-9.9.4.87374\temp\sq-process4478585880210003815prop
WARNING: A terminally deprecated method in java.lang.System has been called
WARNING: System::setSecurityManager has been called by org.sonar.process.PluginSecurityManager (file:/D:/Tools/sonarqube-9.
ar)
WARNING: Please consider reporting this to the maintainers of org.sonar.process.PluginSecurityManager
WARNING: System::setSecurityManager will be removed in a future release
2024.04.11 09:38:10 INFO  app[][o.s.a.SchedulerImpl] Process[ce] is up
2024.04.11 09:38:10 INFO  app[][o.s.a.SchedulerImpl] SonarQube is operational
```

The SonarQube is started in my local Machine to make analysis on it.

STEP-2: Login and Create a Project in SonarQube webpage

Log in to SonarQube

admin

••••••••••

Log in   Cancel

Login using login credentials, then move to create the project for Stating the code Analysis.

---

sonarqube   Projects   Issues   Rules   Quality Profiles   Quality Gates   Administration

Create a project

All fields marked with * are required

Project display name *

VMS-Sonar-Project

Up to 255 characters. Some scanners might override the value you provide.

Project key *

VMS-Sonar-Project

The project key is a unique identifier for your project. It may contain up to 400 characters. Allowed characters are alphanumeric, '-' (dash), '_' (underscore), '.' (period) and ':' (colon), with at least one non-digit.

Main branch name *

main

The name of your project's default branch ☑ Learn More

Set Up

As per the guidelines of the assessment created the Sonar Project with naming Conventions.

Created a Project token and started to initiate the sonar project for our code testings

1 Provide a token

◉ Generate a project token

Token name ⊘   Expires in

Analyze "VMS-Sonar-Project"   No expira... ▼   Generate

ⓘ   Please note that this token will only allow you to analyze the current project. If you want to use the same token to analyze multiple projects, you need to generate a global token in your user account. See the ↗ documentation for more information.

Next create a Sonar Scanner for analyzing the code, which is ready for test.

STEP-3: Run a Sonar Scanner on the project directory

The following line of code is generated for the Maven Project, this will be run on the directory of the code

mvn clean verify sonar:sonar -Dsonar.projectKey=VMS-Sonar-Project -Dsonar.host.url=http://localhost:9000 -Dsonar.login=sqp_bb4e27500b65203c6f89874679782a935ea30e1b

 The following will be the Run the Scanner on the project directory,



```
Microsoft Windows [Version 10.0.19045.4291]
(c) Microsoft Corporation. All rights reserved.

D:\CodingStandards\Vehicle Management System>mvn clean verify sonar:sonar -Dsonar.projectKey=VMS-Sonar-Project -Dsonar.host.url=http://localhost:9000 -Dsonar.login=sq
bb4e27500b65203c6f89874679782a935ea30e1b
[INFO] Scanning for projects...
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.1.0/maven-clean-plugin-3.1.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.1.0/maven-clean-plugin-3.1.0.pom (5.2 kB at 5.4 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.5.2/maven-install-plugin-2.5.2.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.5.2/maven-install-plugin-2.5.2.pom (6.4 kB at 46 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/25/maven-plugins-25.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/25/maven-plugins-25.pom (9.6 kB at 46 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/24/maven-parent-24.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/24/maven-parent-24.pom (37 kB at 151 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/apache/14/apache-14.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/14/apache-14.pom (15 kB at 79 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-deploy-plugin/2.8.2/maven-deploy-plugin-2.8.2.pom
```

The error is due to the test file in the Project,

```
[INFO]
[INFO] Results:
[INFO]
[ERROR] Errors:
[ERROR]    VehicleRestApplicationTests.contextLoads » IllegalState Failed to load Applica...
[INFO]
[ERROR] Tests run: 1, Failures: 0, Errors: 1, Skipped: 0
[INFO]
[INFO]
[INFO] ------------------------------------------------------------------------
[INFO] Skipping VehicleREST
[INFO] This project has been banned from the build due to previous failures.
[INFO] ------------------------------------------------------------------------
[INFO] ------------------------------------------------------------------------
[INFO] BUILD FAILURE
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  01:40 min
[INFO] Finished at: 2024-04-11T10:13:28+05:30
[INFO] ------------------------------------------------------------------------
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-surefire-plugin:2.22.2:test (default-test) on project VehicleREST: There are test failures.
[ERROR]
[ERROR] Please refer to D:\CodingStandards\Vehicle Management System\target\surefire-reports for the individual test results.
[ERROR] Please refer to dump files (if any exist) [date].dump, [date]-jvmRun[N].dump and [date].dumpstream.
[ERROR] -> [Help 1]
[ERROR]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR]
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException
```
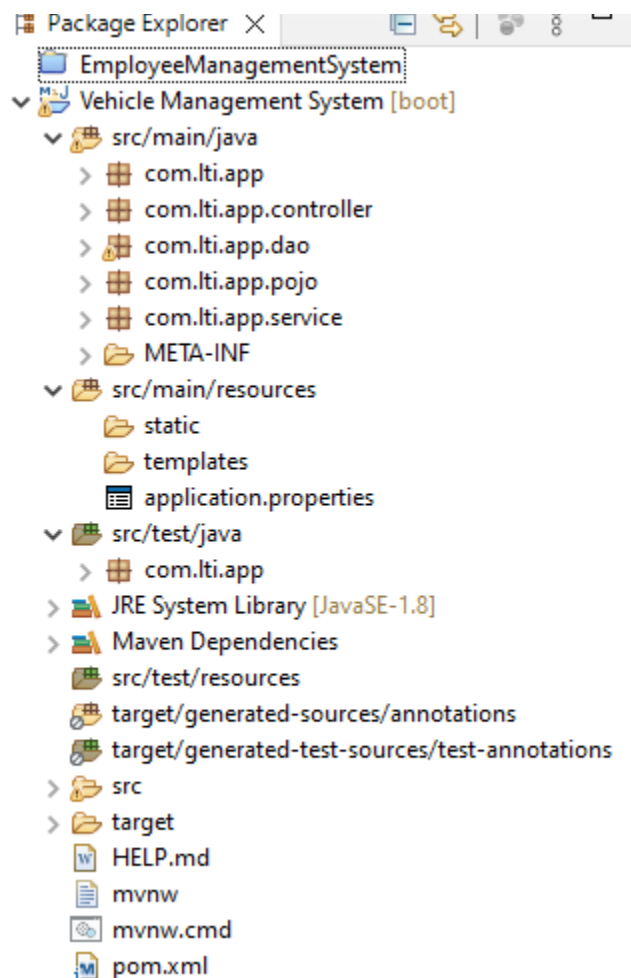

For Clearing that, remove those testing stuffs from the project directory.

After Removing that, The Scanner will work perfectly.

```
INFO] 10:26:25.080 0/0 source files have been analyzed
INFO] 10:26:25.081 Sensor IaC Docker Sensor [iac] (done) | time=82ms
INFO] 10:26:25.086 ------------- Run sensors on project
INFO] 10:26:25.180 Sensor Analysis Warnings import [csharp]
INFO] 10:26:25.181 Sensor Analysis Warnings import [csharp] (done) | time=1ms
INFO] 10:26:25.182 Sensor Zero Coverage Sensor
INFO] 10:26:25.225 Sensor Zero Coverage Sensor (done) | time=43ms
INFO] 10:26:25.226 Sensor Java CPD Block Indexer
INFO] 10:26:25.262 Sensor Java CPD Block Indexer (done) | time=36ms
INFO] 10:26:25.264 SCM Publisher No SCM system was detected. You can use the 'sonar.scm.provider' property to explicitly specify it.
INFO] 10:26:25.269 CPD Executor 3 files had no CPD blocks
INFO] 10:26:25.269 CPD Executor Calculating CPD for 5 files
INFO] 10:26:25.289 CPD Executor CPD calculation finished (done) | time=18ms
INFO] 10:26:25.552 Analysis report generated in 249ms, dir size=151.1 kB
INFO] 10:26:26.043 Analysis report compressed in 489ms, zip size=34.4 kB
INFO] 10:26:26.323 Analysis report uploaded in 279ms
INFO] 10:26:26.339 ANALYSIS SUCCESSFUL, you can find the results at: http://localhost:9000/dashboard?id=VMS-Sonar-Project
INFO] 10:26:26.342 Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report
INFO] 10:26:26.347 More about the report processing at http://localhost:9000/api/ce/task?id=AY7Lg6WsQypKO7pq4YAW
INFO] 10:26:26.618 Analysis total time: 10.727 s
INFO] ------------------------------------------------------------------
INFO] BUILD SUCCESS
INFO] ------------------------------------------------------------------
INFO] Total time:  01:31 min
INFO] Finished at: 2024-04-11T10:26:26+05:30
INFO] ------------------------------------------------------------------
```
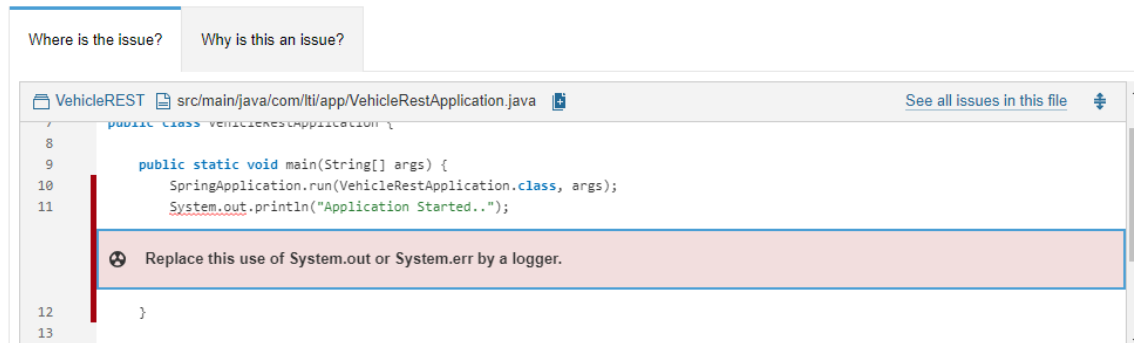
STEP-IV: **Analyse the Bugs, Smells and others from the Sonar Web resources**

The following Picture Represents the test results of the Project, hence need to Solve that.
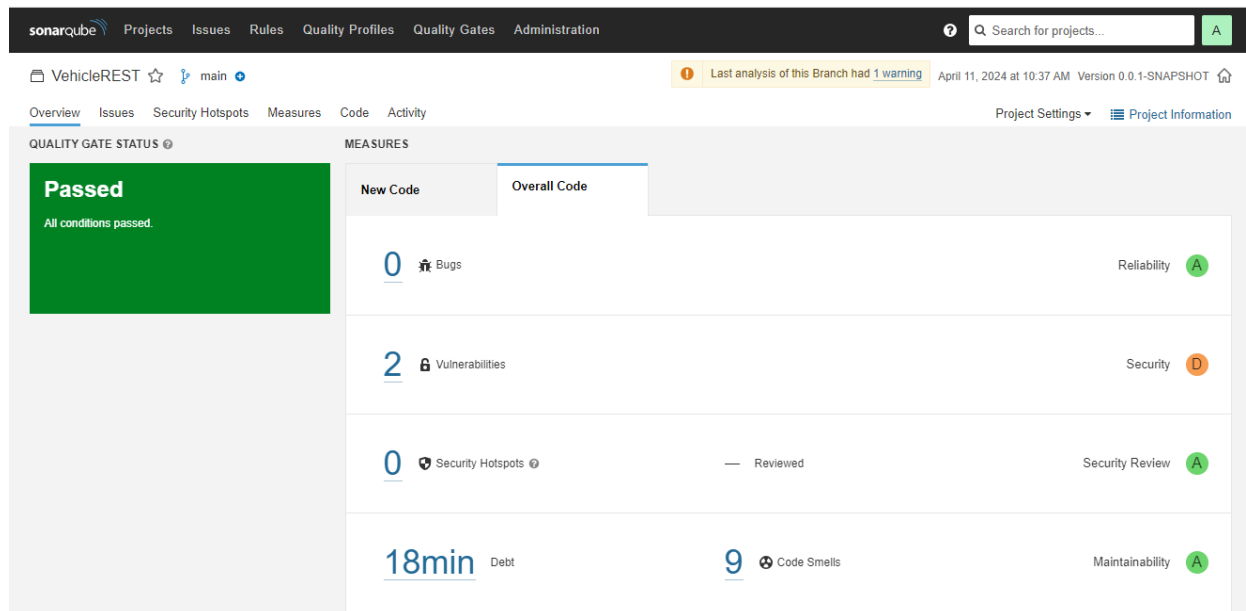
The result of Project consists of **8 Code Smells** and **2 vulnerabilities.** One by one we need to rectify for improving the code quality and Error free codes.

Sample error of Code Smell,

Where is the issue?	Why is this an issue?

VehicleREST src/main/java/com/lti/app/VehicleRestApplication.java   See all issues in this file

```
 7      public class VehicleRestApplication {
 8
 9          public static void main(String[] args) {
10              SpringApplication.run(VehicleRestApplication.class, args);
11              System.out.println("Application Started..");
```

⊗ Replace this use of System.out or System.err by a logger.

```
12          }
13
```

Way of Rectifying it:

```java
@SpringBootApplication
public class VehicleRestApplication {

    public static void main(String[] args) {
        SpringApplication.run(VehicleRestApplication.class, args);
        System.err.println("Application Started..");
    }

}
```

In this above rectifying those error using system.err to improve code quality and standards of the project.

Hence, next moving to the clearance of code smell and vulnerabilities improves the code Quality.

Like this above removed all code smells and Bugs, The Following Will be the results:

Hence the code Quality is improved with the help of SonarQube tools