

Assignment 7: SonarQube and Sonar Scanner

Download SonarQube and Sonar Scanner

The image shows two screenshots from a web browser. The top screenshot is the SonarQube download page (sonarqube.org/downloads/). It features a navigation bar with links for Product, What's New, Documentation, and Community. The main heading is "Download SonarQube" with the tagline "The leading product for Code Quality and Security" and "HELPING DEVS SINCE 2008". Below this, it lists four editions: Community, Developer, Enterprise, and Data Center. Each edition has a "Download" button and a list of features. The bottom screenshot is the SonarScanner documentation page (docs.sonarqube.org/latest/analysis/scan/sonarscanner/). It shows the "Configuring your project" section, which includes instructions on how to create a configuration file named sonar-project.properties in the project's root directory. The configuration file content is as follows:

```
# must be unique in a given SonarQube instance
sonar.projectKey=my:project

# --- optional properties ---

# defaults to project key
#sonar.projectName=My project
# defaults to 'not provided'
#sonar.projectVersion=1.0

# Path is relative to the sonar-project.properties file. Defaults to .
#sonar.sources=.
```

After downloading, set Environment Variables. Add "sonarqube-9.1.0.47736\bin" to Path.

- cd "sonarqube-9.1.0.47736\bin\windows-x86-64"
- StartSonar.bat

```

SonarQube
Microsoft Windows [Version 10.0.19043.1227]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Priyansi>cd "C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\bin\windows-x86-64"

C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\bin\windows-x86-64>StartSonar.bat
Wrapper --> Wrapper Started as Console
Wrapper Launching a JVM...
JVM 1 Wrapper (Version 3.2.3) http://wrapper.tanukisoftware.org
JVM 1 Copyright 1999-2006 Tanuki Software, Inc. All Rights Reserved.
JVM 1
JVM 1 2021.09.29 13:50:37 INFO app[[o.s.a.AppFilesystem] Cleaning or creating temp directory C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp
JVM 1 2021.09.29 13:50:37 INFO app[[o.s.a.es.EsSettings] Elasticsearch listening on [HTTP: 127.0.0.1:9001, TCP: 127.0.0.1:53055]
JVM 1 2021.09.29 13:50:37 INFO app[[o.s.a.ProcessLauncherImpl] Launch process[key='es', ipcIndex=1, logFilenamePrefix=es] from [C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\elasticsearch]: C:\Program Files\Java\jdk-11.0.12\bin\java -XX:+UseG1GC -Djava.io.tmpdir=C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp -XX:ErrorFile=../logs/es_hs_err_pid%p.log -Des.networkaddress.cache.ttl=60 -Des.networkaddress.cache.negative.ttl=10 -XX:+AlwaysPreTouch -Xss1m -Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djava.nosys=true -XX:OmitStackTraceInFastThrow -Dio.netty.noUnsafe=true -Dio.netty.noKeySetOptimization=true -Dio.netty.recycler.maxCapacityPerThread=0 -Dio.netty.maxDirectMemory=67108864 -Dio.netty.disable.markers=true -Djava.locale.providers=COMPAT -Xms512m -Xmx512m -XX:MaxDirectMemorySize=256m -XX:HeapDumpOnOutOfMemoryError -Delasticsearch.path.home=C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\elasticsearch -Des.path.conf=C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp\conf\elasticsearch.yml -cp lib/* org.elasticsearch.bootstrap.Elasticsearch
JVM 1 2021.09.29 13:50:37 INFO app[[o.s.a.SchedulerImpl] Waiting for Elasticsearch to be up and running
JVM 1 2021.09.29 13:50:39 ERROR app[[o.s.a.p.EsManagedProcess] Failed to check status
JVM 1 org.elasticsearch.ElasticsearchException: java.util.concurrent.ExecutionException: java.net.ConnectException: Timeout connecting to [/127.0.0.1:9001]
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performRequest(RestHighLevelClient.java:2078)
JVM 1 at org.elasticsearch.client.RestHighLevelClient.internalPerformRequest(RestHighLevelClient.java:1732)
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performRequest(RestHighLevelClient.java:1702)
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performRequestAndParseEntity(RestHighLevelClient.java:1672)
JVM 1 at org.elasticsearch.client.ClusterClient.health(ClusterClient.java:119)
JVM 1 at org.sonar.application.es.EsConnectorImpl.getClusterHealthStatus(EsConnectorImpl.java:64)
JVM 1 at org.sonar.application.process.EsManagedProcess.checkStatus(EsManagedProcess.java:90)
JVM 1 at org.sonar.application.process.EsManagedProcess.checkOperational(EsManagedProcess.java:75)
JVM 1 at org.sonar.application.process.EsManagedProcess.isOperational(EsManagedProcess.java:60)
JVM 1 at org.sonar.application.process.ManagedProcessHandler.refreshState(ManagedProcessHandler.java:220)
JVM 1 at org.sonar.application.process.ManagedProcessHandler$EventWatcher.run(ManagedProcessHandler.java:285)
JVM 1 Caused by: java.util.concurrent.ExecutionException: java.net.ConnectException: Timeout connecting to [/127.0.0.1:9001]
JVM 1 at org.elasticsearch.common.util.concurrent.BaseFuture$Sync.getValue(BaseFuture.java:262)
JVM 1 at org.elasticsearch.common.util.concurrent.BaseFuture$Sync.get(BaseFuture.java:249)
JVM 1 at org.elasticsearch.common.util.concurrent.BaseFuture.get(BaseFuture.java:76)
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performClientRequest(RestHighLevelClient.java:2075)
JVM 1 ... 10 common frames omitted
JVM 1 Caused by: java.net.ConnectException: Timeout connecting to [/127.0.0.1:9001]
JVM 1 at org.apache.http.nio.pool.RouteSpecificPool.timeout(RouteSpecificPool.java:169)
JVM 1 at org.apache.http.nio.pool.AbstractNIOConnPool.requestTimeout(AbstractNIOConnPool.java:628)
JVM 1 at org.apache.http.nio.pool.AbstractNIOConnPool$InternalSessionRequestCallback.timeout(AbstractNIOConnPool.java:894)
JVM 1 at org.apache.http.impl.nio.reactor.SessionRequestImpl.timeout(SessionRequestImpl.java:184)
JVM 1 at org.apache.http.impl.nio.reactor.DefaultConnectingIOReactor.processTimeouts(DefaultConnectingIOReactor.java:214)
JVM 1 at org.apache.http.impl.nio.reactor.DefaultConnectingIOReactor.processEvents(DefaultConnectingIOReactor.java:158)
JVM 1 at org.apache.http.impl.nio.reactor.AbstractMultiworkerIOReactor.execute(AbstractMultiworkerIOReactor.java:351)
JVM 1 at org.apache.http.impl.nio.conn.PoolingNHttpClientConnectionManager.execute(PoolingNHttpClientConnectionManager.java:221)
JVM 1 at org.apache.http.impl.nio.client.CloseableHttpAsyncClientBase$1.run(CloseableHttpAsyncClientBase.java:64)
JVM 1 at java.base/java.lang.Thread.run(Thread.java:834)
JVM 1
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performRequest(RestHighLevelClient.java:1702)
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performRequestAndParseEntity(RestHighLevelClient.java:1672)
JVM 1 at org.elasticsearch.client.ClusterClient.health(ClusterClient.java:119)
JVM 1 at org.sonar.application.es.EsConnectorImpl.getClusterHealthStatus(EsConnectorImpl.java:64)
JVM 1 at org.sonar.application.process.EsManagedProcess.checkStatus(EsManagedProcess.java:90)
JVM 1 at org.sonar.application.process.EsManagedProcess.checkOperational(EsManagedProcess.java:75)
JVM 1 at org.sonar.application.process.EsManagedProcess.isOperational(EsManagedProcess.java:60)
JVM 1 at org.sonar.application.process.ManagedProcessHandler.refreshState(ManagedProcessHandler.java:220)
JVM 1 at org.sonar.application.process.ManagedProcessHandler$EventWatcher.run(ManagedProcessHandler.java:285)
JVM 1 Caused by: java.util.concurrent.ExecutionException: java.net.ConnectException: Timeout connecting to [/127.0.0.1:9001]
JVM 1 at org.elasticsearch.common.util.concurrent.BaseFuture$Sync.getValue(BaseFuture.java:262)
JVM 1 at org.elasticsearch.common.util.concurrent.BaseFuture$Sync.get(BaseFuture.java:249)
JVM 1 at org.elasticsearch.common.util.concurrent.BaseFuture.get(BaseFuture.java:76)
JVM 1 at org.elasticsearch.client.RestHighLevelClient.performClientRequest(RestHighLevelClient.java:2075)
JVM 1 ... 10 common frames omitted
JVM 1 Caused by: java.net.ConnectException: Timeout connecting to [/127.0.0.1:9001]
JVM 1 at org.apache.http.nio.pool.RouteSpecificPool.timeout(RouteSpecificPool.java:169)
JVM 1 at org.apache.http.nio.pool.AbstractNIOConnPool.requestTimeout(AbstractNIOConnPool.java:628)
JVM 1 at org.apache.http.nio.pool.AbstractNIOConnPool$InternalSessionRequestCallback.timeout(AbstractNIOConnPool.java:894)
JVM 1 at org.apache.http.impl.nio.reactor.SessionRequestImpl.timeout(SessionRequestImpl.java:184)
JVM 1 at org.apache.http.impl.nio.reactor.DefaultConnectingIOReactor.processTimeouts(DefaultConnectingIOReactor.java:214)
JVM 1 at org.apache.http.impl.nio.reactor.DefaultConnectingIOReactor.processEvents(DefaultConnectingIOReactor.java:158)
JVM 1 at org.apache.http.impl.nio.reactor.AbstractMultiworkerIOReactor.execute(AbstractMultiworkerIOReactor.java:351)
JVM 1 at org.apache.http.impl.nio.conn.PoolingNHttpClientConnectionManager.execute(PoolingNHttpClientConnectionManager.java:221)
JVM 1 at org.apache.http.impl.nio.client.CloseableHttpAsyncClientBase$1.run(CloseableHttpAsyncClientBase.java:64)
JVM 1 at java.base/java.lang.Thread.run(Thread.java:834)
JVM 1
JVM 1 2021.09.29 13:50:50 INFO app[[o.s.a.SchedulerImpl] Process[ce] is up
JVM 1 2021.09.29 13:50:50 INFO app[[o.s.a.ProcessLauncherImpl] Launch process[key='web', ipcIndex=2, logFilenamePrefix=web] from [C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736]: C:\Program Files\Java\jdk-11.0.12\bin\java -Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djava.io.tmpdir=C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp -XX:OmitStackTraceInFastThrow -Dadd-opens=java.base/java.util=ALL-UNNAMED -Dadd-opens=java.base/java.lang=ALL-UNNAMED -Dadd-opens=java.base/java.io=ALL-UNNAMED -Dadd-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED -Dadd-exports=java.base/jdk.internal.ref=ALL-UNNAMED -Dadd-opens=java.base/java.nio=ALL-UNNAMED -Dadd-opens=java.base/sun.nio.ch=ALL-UNNAMED -Dadd-opens=java.management/sun.management=ALL-UNNAMED -Dadd-opens=java.management/com.sun.management.internal=ALL-UNNAMED -Xms512m -Xmx128m -XX:HeapDumpOnOutOfMemoryError -Dhttp.nonProxyHosts=localhost[127.*:*] -cp /lib/sonar-application-9.1.0.47736-jar;C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\lib\jdbc\h2-1.4.199.jar org.sonar.server.app.WebServer C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp\sonar-process\77945169172441019properties
JVM 1 2021.09.29 13:51:42 INFO app[[o.s.a.SchedulerImpl] Process[ce] is up
JVM 1 2021.09.29 13:51:42 INFO app[[o.s.a.ProcessLauncherImpl] Launch process[key='ce', ipcIndex=3, logFilenamePrefix=ce] from [C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736]: C:\Program Files\Java\jdk-11.0.12\bin\java -Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djava.io.tmpdir=C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp -XX:OmitStackTraceInFastThrow -Dadd-opens=java.base/java.util=ALL-UNNAMED -Dadd-exports=java.base/jdk.internal.ref=ALL-UNNAMED -Dadd-opens=java.base/java.lang=ALL-UNNAMED -Dadd-opens=java.base/java.nio=ALL-UNNAMED -Dadd-opens=java.management/sun.management=ALL-UNNAMED -Dadd-opens=java.management/com.sun.management.internal=ALL-UNNAMED -Xms512m -Xmx128m -XX:HeapDumpOnOutOfMemoryError -Dhttp.nonProxyHosts=localhost[127.*:*] -cp /lib/sonar-application-9.1.0.47736-jar;C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\lib\jdbc\h2-1.4.199.jar org.sonar.app.CeServer C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\temp\sq-process\39444487414319503properties
JVM 1 2021.09.29 13:51:42 WARN app[[startup] #####
JVM 1 2021.09.29 13:51:42 WARN app[[[startup] Default Administrator credentials are still being used. Make sure to change the password or deactivate the account.
JVM 1 2021.09.29 13:51:42 WARN app[[[startup] #####
JVM 1 2021.09.29 13:51:46 INFO app[[o.s.a.SchedulerImpl] Process[ce] is up
JVM 1 2021.09.29 13:51:46 INFO app[[o.s.a.SchedulerImpl] SonarQube is up

```

Open another command prompt. Run command:

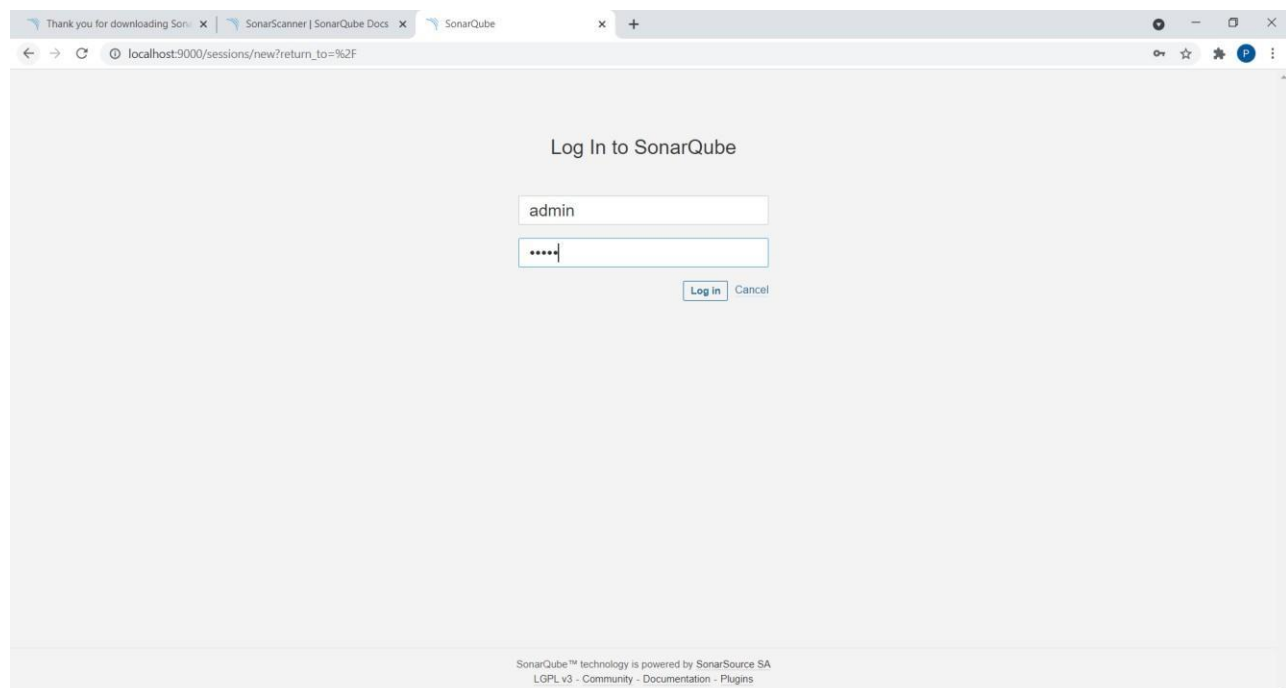
- `cd "sonar-scanner-4.6.2.2472-windows\bin"`
- `sonar-scanner`

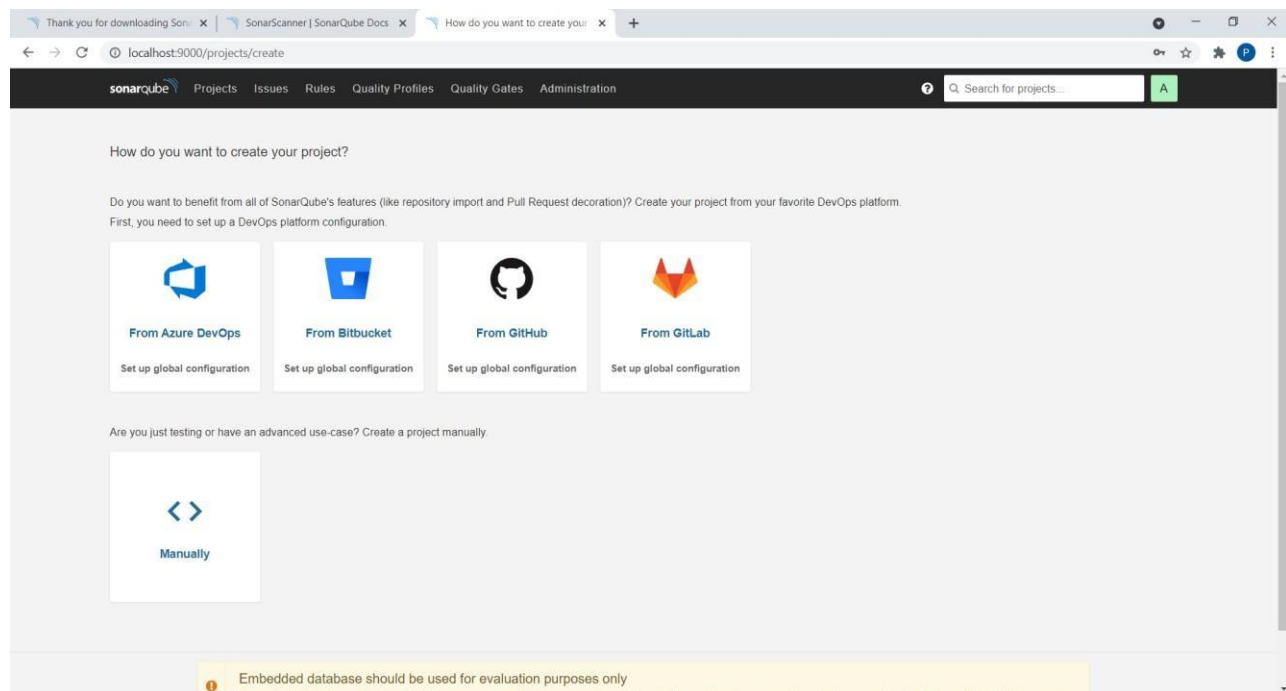
```
Command Prompt
C:\Users\Priyansi\Downloads\sonar-scanner-4.6.2.2472-windows\bin>sonar-scanner
INFO: Scanner configuration file: C:\Users\Priyansi\Downloads\sonar-scanner-4.6.2.2472-windows\bin\..\conf\sonar-scanner.properties
INFO: Project root configuration file: NONE
INFO: SonarScanner 4.6.2.2472
INFO: Java 11.0.11 AdoptOpenJDK (64-bit)
INFO: Windows 10 10.0 amd64
INFO: User cache: C:\Users\Priyansi\.sonar\cache
INFO: Scanner configuration file: C:\Users\Priyansi\Downloads\sonar-scanner-4.6.2.2472-windows\bin\..\conf\sonar-scanner.properties
INFO: Project root configuration file: NONE
INFO: Analyzing on SonarQube server 9.1.0
INFO: Default locale: "en_IN", source code encoding: "windows-1252" (analysis is platform dependent)
INFO: Load global settings
INFO: -----
INFO: EXECUTION FAILURE
INFO: -----
INFO: Total time: 3.958s
INFO: Final Memory: 5M/20M
INFO: -----
ERROR: Error during SonarScanner execution
ERROR: Not authorized. Analyzing this project requires authentication. Please provide a user token in sonar.login or other credentials in sonar.login and sonar.password.
ERROR:
ERROR: Re-run SonarScanner using the -X switch to enable full debug logging.

C:\Users\Priyansi\Downloads\sonar-scanner-4.6.2.2472-windows\bin>
```

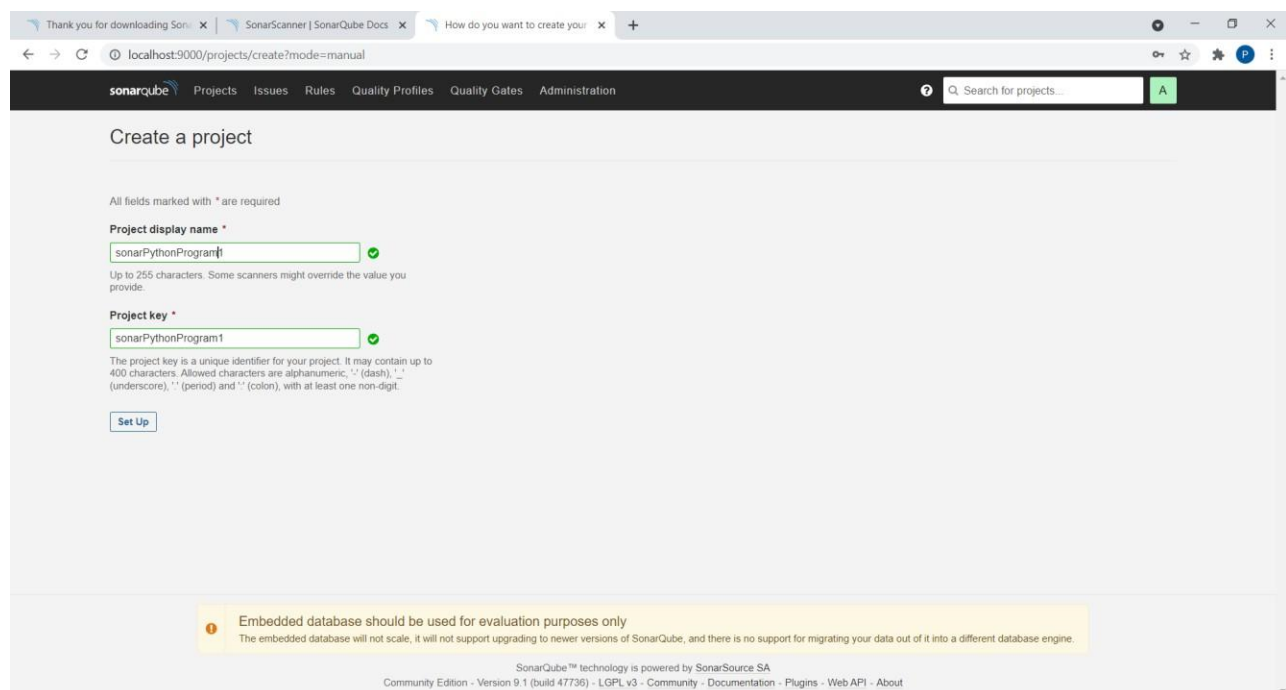
Server up and running on **localhost:9000**

Login using credentials as User: admin and Password: admin and Set a new password

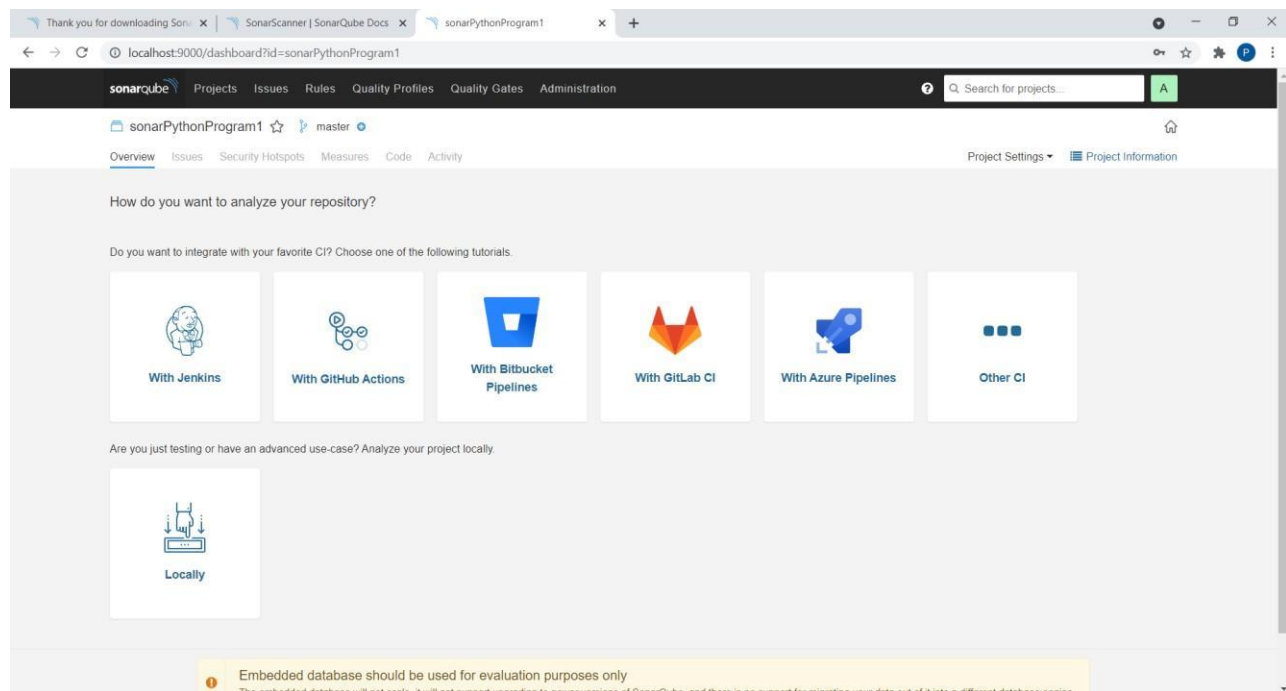




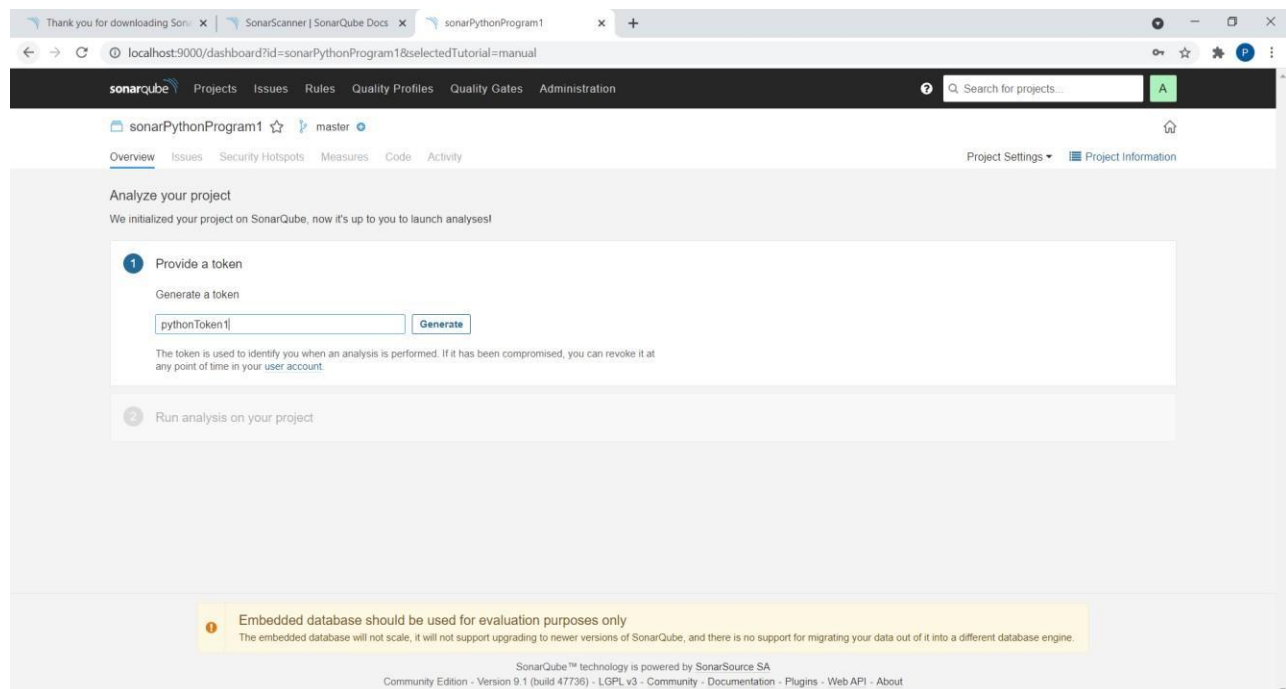
Click on Create a project **Manually**.



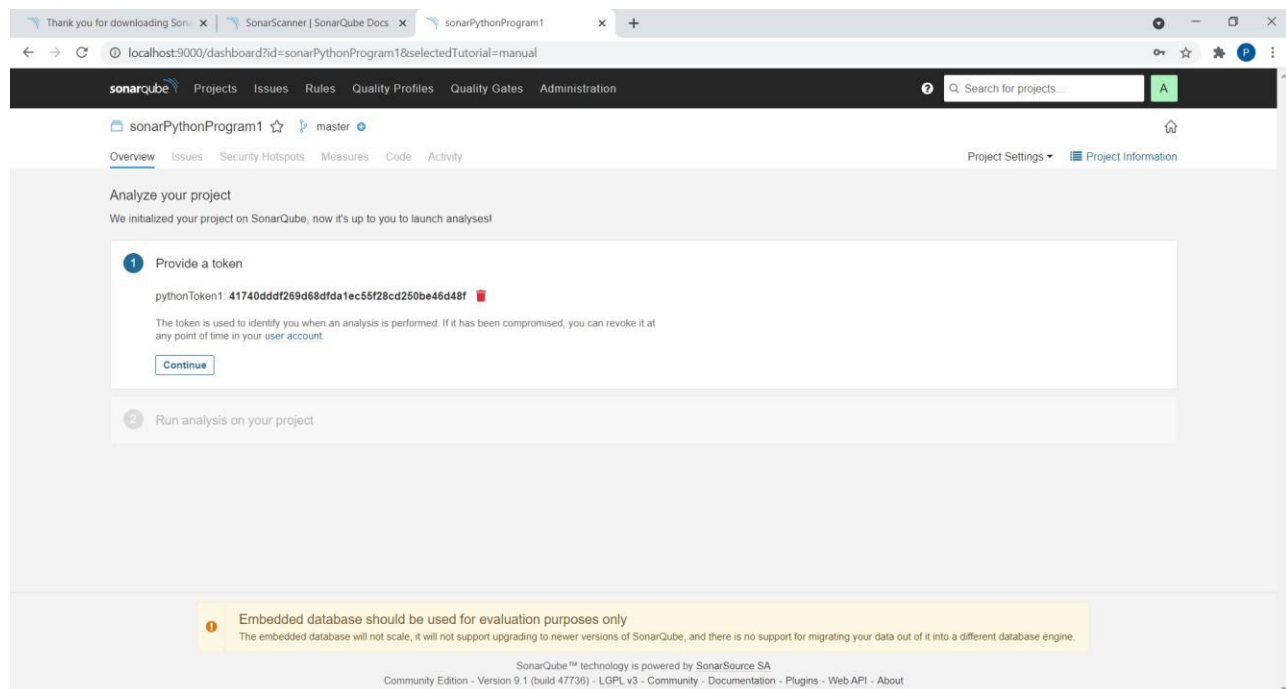
Give any Project display name.



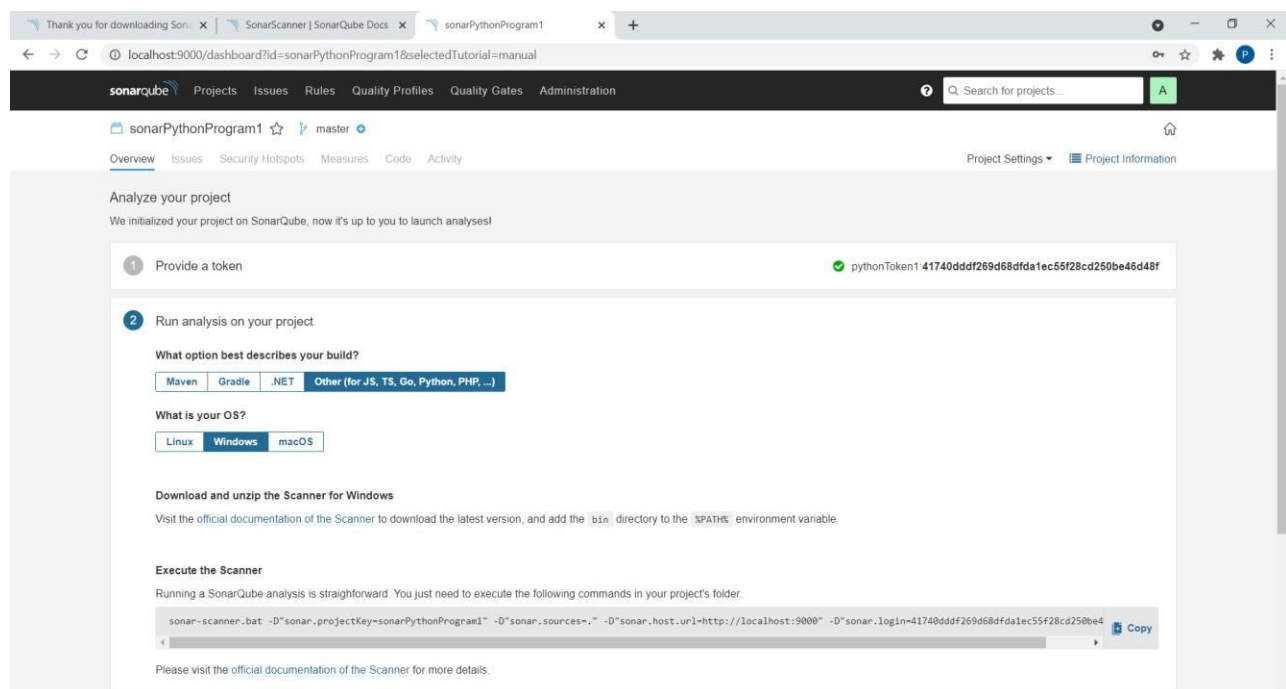
Click on **Locally**.



Give any name to token and click on **Generate**.



Click on **Continue**.



Save a Python program in a folder.

```
class Solution(object):  
    def romanToInt(self, s):
```

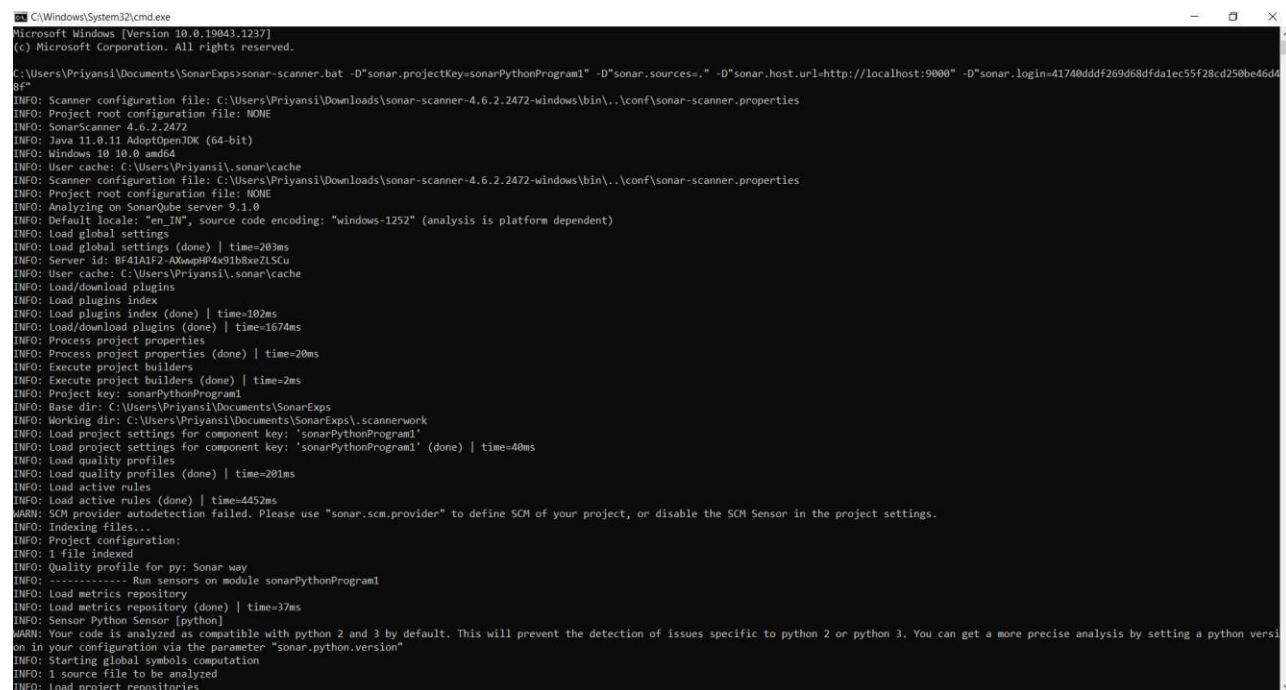
```

roman =
{'I':1,'V':5,'X':10,'L':50,'C':100,'D':500,'M':1000,'IV':4,'IX':9,'XL':40,'XC':90,'CD':400,'CM':900}
i = 0
num = " "
while i < len(s):
    if i+1<len(s) and s[i:i+2] in roman:
        num+=roman[s[i:i+2]]
        i+=2
    else:
        #print(i)
        num+=roman[s[i]]
        i+=1
return num
ob1 = Solution()
print(ob1.romanToInt("III"))
print(ob1.romanToInt("CDXLIII"))

```

Open command prompt in this folder and Run program using copied command.

"sonar-scanner.bat -D"sonar.projectKey=sonarPythonProgram1" -D"sonar.sources=" " -
D"sonar.host.url=http://localhost:9000" -D"sonar.login=41740dddf269d68dfda1ec55f28cd250be46d48f"



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19043.1237]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Priyansi\Documents\SonarExps>sonar-scanner.bat -D"sonar.projectKey=sonarPythonProgram1" -D"sonar.sources=" " -D"sonar.host.url=http://localhost:9000" -D"sonar.login=41740dddf269d68dfda1ec55f28cd250be46d48f"

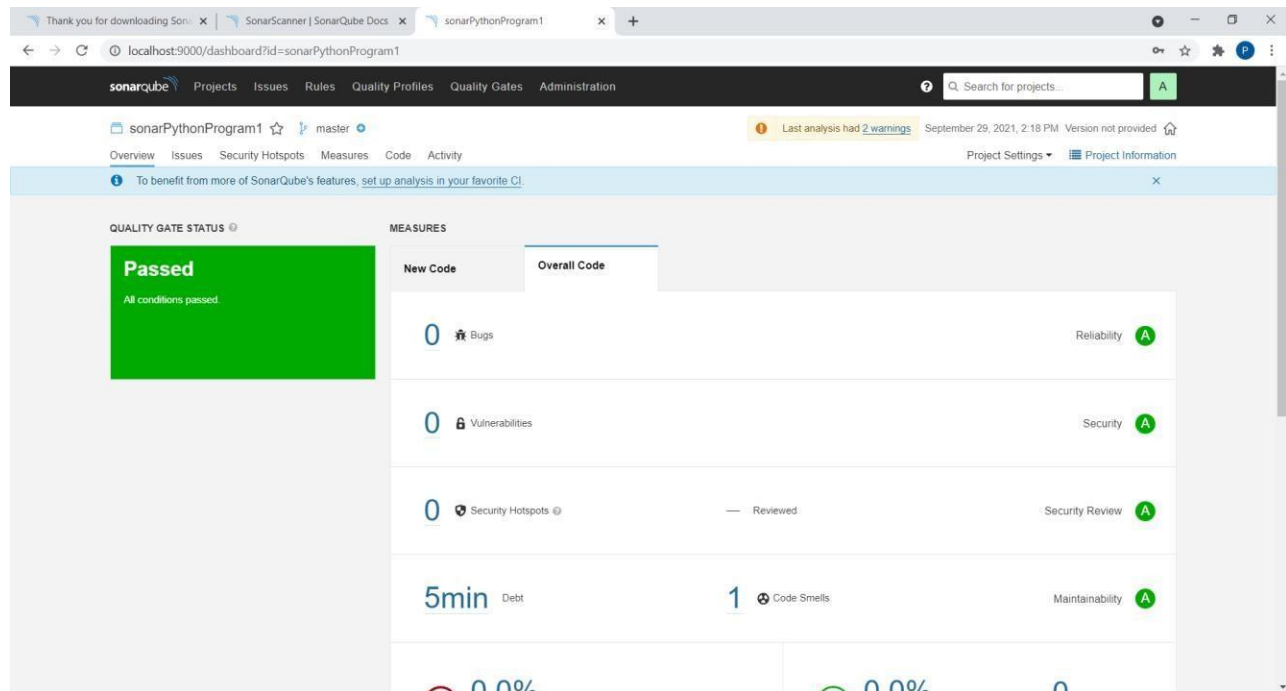
INFO: Scanner configuration file: C:\Users\Priyansi\Downloads\sonar-scanner-4.6.2.2472-windows\bin\..\conf\sonar-scanner.properties
INFO: Project root configuration file: NONE
INFO: SonarScanner 4.6.2.2472
INFO: Java 11.0.11 AdoptOpenJDK (64-bit)
INFO: Windows 10 10.0 amd64
INFO: User cache: C:\Users\Priyansi\sonar\cache
INFO: Scanner configuration file: C:\Users\Priyansi\Downloads\sonar-scanner-4.6.2.2472-windows\bin\..\conf\sonar-scanner.properties
INFO: Project root configuration file: NONE
INFO: Analyzing on SonarQube server 9.1.0
INFO: Default locale: "en_IN", source code encoding: "windows-1252" (analysis is platform dependent)
INFO: Load global settings
INFO: Load global settings (done) | time=203ms
INFO: Server id: BF41A1F2-A0aWpH4x91b8xe7L5Cu
INFO: User cache: C:\Users\Priyansi\sonar\cache
INFO: Load/download plugins
INFO: Load plugins index
INFO: Load plugins index (done) | time=102ms
INFO: Load/download plugins (done) | time=1674ms
INFO: Process project properties
INFO: Process project properties (done) | time=20ms
INFO: Execute project builders
INFO: Execute project builders (done) | time=2ms
INFO: Project key: sonarPythonProgram1
INFO: Base dir: C:\Users\Priyansi\Documents\SonarExps
INFO: Working dir: C:\Users\Priyansi\Documents\SonarExps\scannerwork
INFO: Load project settings for component key: 'sonarPythonProgram1'
INFO: Load project settings for component key: 'sonarPythonProgram1' (done) | time=40ms
INFO: Load quality profiles
INFO: Load quality profiles (done) | time=201ms
INFO: Load active rules
INFO: Load active rules (done) | time=4452ms
WARN: SCM provider autodetection failed. Please use "sonar.scm.provider" to define SCM of your project, or disable the SCM Sensor in the project settings.
INFO: Project configuration:
INFO: 1 file indexed
INFO: Quality profile for py: Sonar way
INFO: ----- Run sensors on module sonarPythonProgram1
INFO: Load metrics repository
INFO: Load metrics repository (done) | time=37ms
INFO: Sensor Python Sensor [python]
WARN: Your code is analyzed as compatible with python 2 and 3 by default. This will prevent the detection of issues specific to python 2 or python 3. You can get a more precise analysis by setting a python version in your configuration via the parameter "sonar.python.version"
INFO: Starting global symbols computation
INFO: 1 source file to be analyzed
INFO: Load project repositories

```



```
C:\Windows\System32\cmd.exe
INFO: Sensor HTML [web] (done) | time=2ms
INFO: Sensor VB.NET Project Type Information [vbnet]
INFO: Sensor VB.NET Project Type Information [vbnet] (done) | time=1ms
INFO: Sensor VB.NET Analysis Log [vbnet]
INFO: Sensor VB.NET Analysis Log [vbnet] (done) | time=12ms
INFO: Sensor VB.NET Properties [vbnet]
INFO: Sensor VB.NET Properties [vbnet] (done) | time=0ms
INFO: ----- Run sensors on project
INFO: Sensor Zero Coverage Sensor
INFO: Sensor Zero Coverage Sensor (done) | time=12ms
INFO: SCM Publisher No SCM system was detected. You can use the 'sonar.scm.provider' property to explicitly specify it.
INFO: CPD Executor Calculating CPD for 1 file
INFO: CPD Executor CPD calculation finished (done) | time=10ms
INFO: Analysis report generated in 59ms, dir size=103.9 KB
INFO: Analysis report compressed in 19ms, zip size=14.7 KB
INFO: Analysis report uploaded in 76ms
INFO: ANALYSIS SUCCESSFUL, you can browse http://localhost:9000/dashboard?id=sonarPythonProgram1
INFO: Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report
INFO: More about the report processing at http://localhost:9000/api/ce/task?id=AXwvY1hx91b8xeZLXH1
INFO: Analysis total time: 7.502 s
INFO: -----
INFO: EXECUTION SUCCESS
INFO: -----
INFO: Total time: 10.887s
INFO: Final Memory: 7M/30M
INFO: -----
C:\Users\Priyansi\Documents\SonarExps>
```

Given below is the inspection of code quality to perform automatic reviews with static analysis of code to detect bugs, code smells, and security vulnerabilities.



The screenshot shows the SonarQube dashboard for the project 'sonarPythonProgram1'. The top navigation bar includes links for Projects, Issues, Rules, Quality Profiles, Quality Gates, and Administration. The main content area displays various quality metrics:

- Vulnerabilities:** 0
- Security Hotspots:** 0
- Debt:** 5min
- Code Smells:** 1
- Coverage:** 0.0% (Coverage on 15 Lines to cover)
- Unit Tests:** -
- Duplications:** 0.0% (Duplications on 16 Lines)
- Duplicated Blocks:** 0

The bottom section shows the 'ACTIVITY' tab with a dropdown menu set to 'Issues'. A message indicates that the last analysis had 2 warnings and that the version is not provided.

The screenshot shows the SonarQube Issues page for the project 'sonarPythonProgram1'. The left sidebar contains filters for Type, Severity, Scope, Resolution, Status, Security Category, Creation Date, Language, Rule, Tag, and Directory. The main content area displays a list of issues, with one issue highlighted:

- Issue:** Rename method "romanToInt" to match the regular expression `^[a-z_][a-z0-9_]*$`. Why is this an issue?
- Severity:** Minor
- Effort:** 5min
- Status:** Open
- Resolution:** Not assigned
- Comment:** convention

The bottom section shows a message indicating that the embedded database should be used for evaluation purposes only and that there is no support for migrating data out of it into a different database engine.

Press **“Ctrl + C”** to stop the server.

```
C:\Users\Priyansi\Downloads\sonarqube-9.1.0.47736\bin\windows-x86-64>
```