Documentation: Using SonarQube for Java Project Analysis

Introduction
SonarQube is an open-source platform developed by SonarSource for continuous inspection of code quality to perform automatic reviews with static analysis of code to detect bugs, code smells, and security vulnerabilities.

This documentation provides a step-by-step guide on how to:

1. Run a SonarQube server.
2. Scan a Java project with SonarQube.
3. Review the analysis report and fix highlighted issues.
4. Rescan the code with SonarQube to ensure issues are resolved.

Step 1: Run SonarQube Server
1. **Install Docker Desktop for Mac:**
   - Download and install Docker Desktop for Mac from the official website: [Docker Desktop for Mac](https://www.docker.com/products/docker-desktop)

2. **Run SonarQube Server:**
   - Open Terminal.
   - Run the following command to start SonarQube server:

     ```bash
     docker run -d --name sonarqube -p 9000:9000 sonarqube
     ```

   - SonarQube will be accessible at `http://localhost:9000`.
   - It may take a few minutes for SonarQube to start.

Step 2: Scan a Java Project with SonarQube

1. **Install Homebrew:**
   - Open Terminal.
   - Run the following command to install Homebrew:

2. **Install SonarQube Scanner:**
   - Run the following command to install the SonarQube Scanner:

     ```bash
     brew install sonar-scanner
     ```

3. **Navigate to your Java project directory:**
   - Use `cd` command to navigate to your Java project directory.

4. **Run SonarQube analysis:**
   - Run the following command to analyze your Java project:

     ```bash
     sonar-scanner \
       -Dsonar.projectKey=<your_project_key> \
       -Dsonar.sources=. \
       -Dsonar.host.url=http://localhost:9000 \
       -Dsonar.login=admin \
       -Dsonar.password=admin
     ```

Step 3: Review the Analysis Report

1. **Access SonarQube Web Interface:**
   - Open your web browser.
   - Go to `http://localhost:9000`.
   - Log in using the default credentials (username: admin, password: admin).
   - You will be directed to the SonarQube dashboard.

2. **View Analysis Report:**
   - Click on your project to view the analysis report.
   - Review the issues highlighted by SonarQube.

Step 4: Fix Highlighted Issues

1. **Open your Java project in your preferred Integrated Development Environment (IDE).**
2. **Navigate to the files containing the highlighted issues.**
3. **Fix the issues as per the recommendations provided by SonarQube.**
4. **Repeat Step 2 to rescan the code.**

Step 5: Rescan the Code
1. **Repeat Step 2 by running the SonarQube analysis again.**
2. **Use the same command provided in Step 2.**
3. **After the analysis is complete, revisit the SonarQube web interface.**

Step 6: Verify Fixed Issues
1. **Visit the SonarQube web interface and navigate to your project.**
2. **Compare the new analysis report with the previous one.**
3. **Ensure that the fixed issues have disappeared.**

Conclusion

SonarQube is an invaluable tool for maintaining code quality, detecting issues, and ensuring the security of your Java projects. By following the steps outlined in this documentation, you can easily integrate SonarQube into your development workflow and ensure the quality and security of your codebase.