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♦ Ensuring code quality in Java Q&As

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Posted on [September 27, 2014](#) by [Arulkumaran Kumaraswamipillai](#) — No

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Q1. How do you ensure code quality in your application?

A1. Code quality means writing **readable**, **maintainable** and robust code, that conforms as much as possible to the style-guideline that is used, and that has as little as possible defects. It also means writing maintainable code with proper automated and manual tests.

1. Write a number of automated tests

- Unit tests using **JUnit** or **TestNG**. For unit tests use mock objects to ensure that your tests don't fail due to volatility of the data changes. There are mocking frameworks like **EasyMock**, **Mockito**, and **PowerMock**.

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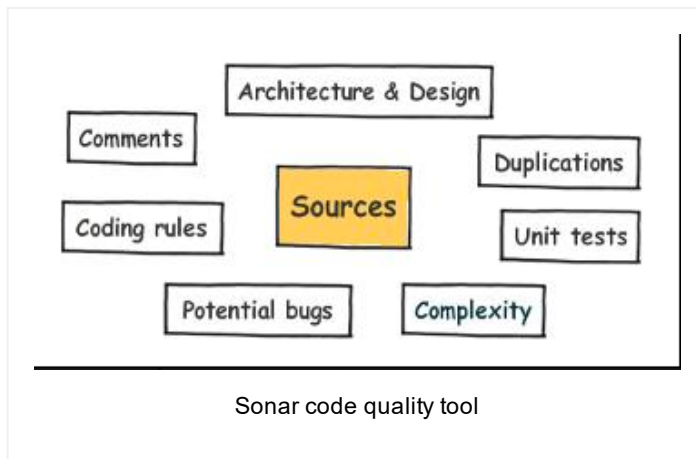
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- Integration testing of your services with **JUnit** or **TestNG**. Your integration tests are only as good as the quality of the data. You could either use dedicated test databases or use frameworks like **DBUnit** to manage extraction and insertion of data.
 - Web testing using **Selenium + WebDriver**. Selenium + WebDriver (Selenium interview questions and answers) allows you to reenact web user experience and run it as an automated unit test using JUnit or TestNG. Your tests are only as good as the quality of the data. You could either use dedicated system test databases or use frameworks like DBUnit. DBUnit allows you to extract the data from databases into flat XML files, and then refresh (i.e. insert or update) the data into the database during setup phase of running the unit tests. There are handy proxy JDBC driver tool called **P6SPY**, which logs the SQL queries that are executed against the database by the **DBUnit**. This P6SPY also very handy in debugging Hibernate's generated SQL by acting as a proxy driver between JDBC and the real driver so that all generated SQL will be logged. There are other Web testing tools like **Badboy**.
 - Load testing your application with tools like **JMeter**, **OpenSTA**, etc. The **Badboy** compliments **JMeter** by allowing you to record scripts and then exporting the scripts as a JMeter file to be used in JMeter. JMeter Interview Questions and Answers
2. Have regular code reviews. There are tools like **Crucible** from Atlassian that gives your team an efficient way to benefit from the power of constant code review with features like inline commenting, simple workflow, asynchronous reviews, email and RSS notifications, JIRA integration and much more.
 3. Using a number of code quality tools.
 - **Checkstyle** ensures the style of your Java code is standardized and "nice". It checks white spaces, new lines, formatting, etc. (i.e. it looks on the code line by line). This only ensure style of your code.

Spring (18)	
Spring boot (4)	
Spring IO (1)	
Spring JavaConf	
01: ♥♦ 13 Spring	
01b: ♦ 13 Spring	
02: ► Spring DI	
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jvisualvm profiling (
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- On the other hand there is **PMD** which not necessarily checks the style of your code but it checks the structure of the whole code. PMD scans Java source code and looks for potential problems like possible bugs, dead code, suboptimal code, overcomplicated expressions, duplicate code, etc.
- **FindBugs** is a static analysis tool to look for bugs in Java code. It discovers possible *NullPointerExceptions* and a lot more bugs.
- **Sonar** is a very powerful tool covering 7 axes of code quality as shown below.



- Using continuous integration servers (on a clean separate machine) like **Bamboo**, **Hudson**, **CruiseControl**, etc to continuously integrate and test your code.
- Not stopping to code once the code works. Too many developers feel their job stops at making something happen. It is a best practice to constantly **refactor code** with proper unit tests in place.

Q2. Do you use test driven development? Why / Why not?

A2. [Hint] Yes.

- Gives you a better understanding of what you're going to write. Gets you to clearly think what the inputs are and what the output is. Helps you separate the concerns by getting you to think about the single responsibility principle (SRP).
- Enforces a better test coverage. This gives you the confidence to refactor your code in the future, since you have a good coverage.

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- You won't waste time writing features you don't need.

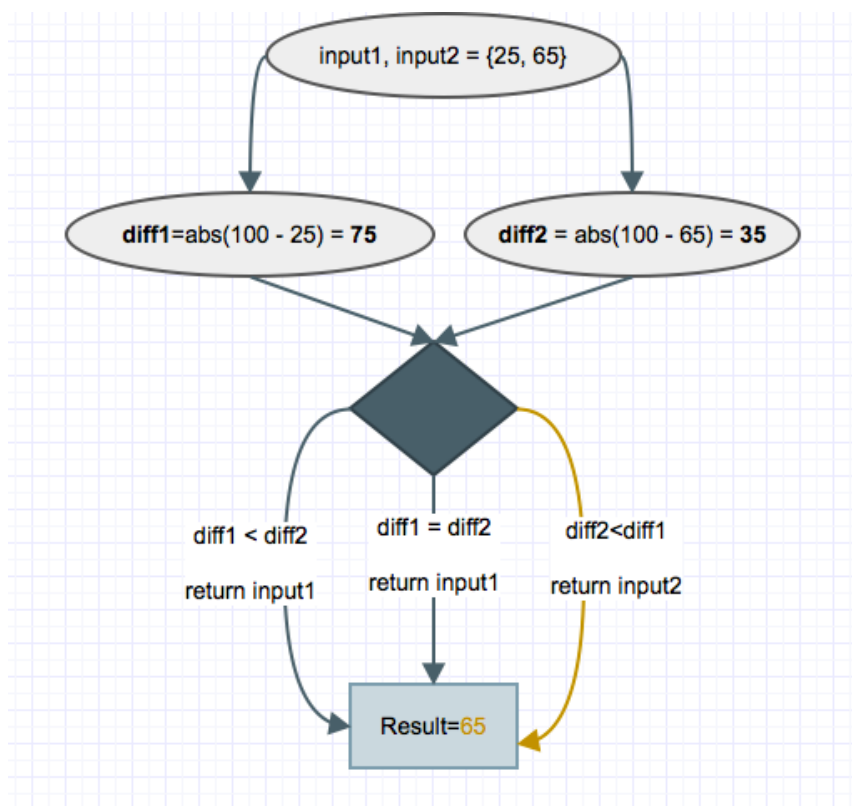
Q3. Write a program that will return whichever value is nearest to the value of 100 from two given int numbers.

A3.

1. Write pseudo code first:

- Compute the difference to 100.
- Find out the absolute difference as negative numbers are valid.
- Compare the differences to find out the nearest number to 100.

2. Draw a diagram if it helps



3. Consider the edge cases and write unit tests

Write test cases for +ve, -ve, equal to, > than and < than values. For example, {25, 65}, {-25, -65}, {30, 30}, {65, 25}, {110, 145}, etc.

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```
1 import org.junit.Assert;
2 import org.junit.Test;
3
4 //{{25, 65}, {-25, -65}, {30, 30}, {65, 25}, {110
5 public class CloseTo100Test {
6
7     @Test
8     public void testPositiveNumbers(){
9         Assert.assertEquals(65,CloseTo100.cal
10    }
11
12     @Test
13     public void testNegativeNumbers(){
14         Assert.assertEquals(-25,CloseTo100.ca
15    }
16
17     @Test
18     public void testEqualNumbers(){
19         Assert.assertEquals(30,CloseTo100.cal
20    }
21
22     @Test
23     public void testLessThan100Numbers(){
24         Assert.assertEquals(65,CloseTo100.cal
25    }
26
27     @Test
28     public void testGreaterThan100Numbers(){
29         Assert.assertEquals(110,CloseTo100.ca
30    }
31
32     @Test
33     public void testNegativeNumbers2(){
34         Assert.assertEquals(-110,CloseTo100.c
35    }
36 }
```

junit-xxx.jar and hamcrest0core-xxx.jar files need to be in the classpath.

4. Write code

```
1 public class CloseTo100 {
2
3     public static int calculate(int input1, int
4
5     //compute the difference. Negative values
6     int input1Diff = Math.abs(100 - input1);
7     int input2Diff = Math.abs(100 - input2);
8
9     //compare the difference
10    if (input1Diff < input2Diff) {
11        return input1;
12    }
13    else if (input2Diff < input1Diff) {
14        return input2;
15    }
16    else{
17        return input1;
```

```
18     }  
19     }  
20  
21 }
```

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