CS6474: Software Testing Laboratory
(Spring 2023)

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Contents

1 FindBugs

Findbugs scans for possible bugs in Java software. Each finding is reported as a warning, but not all of these warnings are necessarily defects, e.g. warnings referring to possible performance issues. The terms bug or bug pattern are used in a misleading way by Findbugs. A better way would be to talk just about warnings. In the following article, the term warning will be used. All warnings are classified in four ranks:
(i) scariest,
(ii) scary,
(iii) troubling and
(iv) of concern.
This is a hint to the developer about the possible impact/severity of the warnings. The current version reports 400 warnings in the nine categories:

Warnings List		
Category	Numbers	Samples
Correctness	142	Illegal format string
Bad practice	84	Confusing method names
Dodgy code	71	Useless control flow
Multithreaded Correctness	45	A thread was created using the default empty run method
Performance	27	Method concatenates strings using + in a loop
Malicious Code Vulnerability	15	Finalizer should be protected, not public
Security	11	Hardcoded constant database password
Experimental	3	Method may fail to clean up stream or resource
Internationalization	2	Consider using Locale parameterized version of invoked method

Installation of Eclipse Plug-In

The Eclipse plug-in work with Eclipse 3.x releases from 3.3. The plug-in runs under Java 1.5 or newer.

For Eclipse 4.2 (Juno) the next steps install the plug-in:

1. In Eclipse, click on Help — Install New Software and press Add button.
   - Insert Name: Findbugs
   - Insert URL: http://Findbugs.cs.umd.edu/eclipse
   - press OK button
2. You should see Findbugs in the list. Select the entry and press Next button.
3. You should see the Install Details without errors and press Next button.
4. Select the ”I accept the terms of the license agreement” option and click Finish button.
5. The plug-in is not digitally signed. Go ahead and install it anyway. (press OK button)
6. Click Yes to make Eclipse restart itself.

Test the below programs in FindBugs Tool

1.1 Write a program to generate a Factorial of numbers (where stack length should be at 3 (max)). The numbers should be 5, 3, 8, and 15.

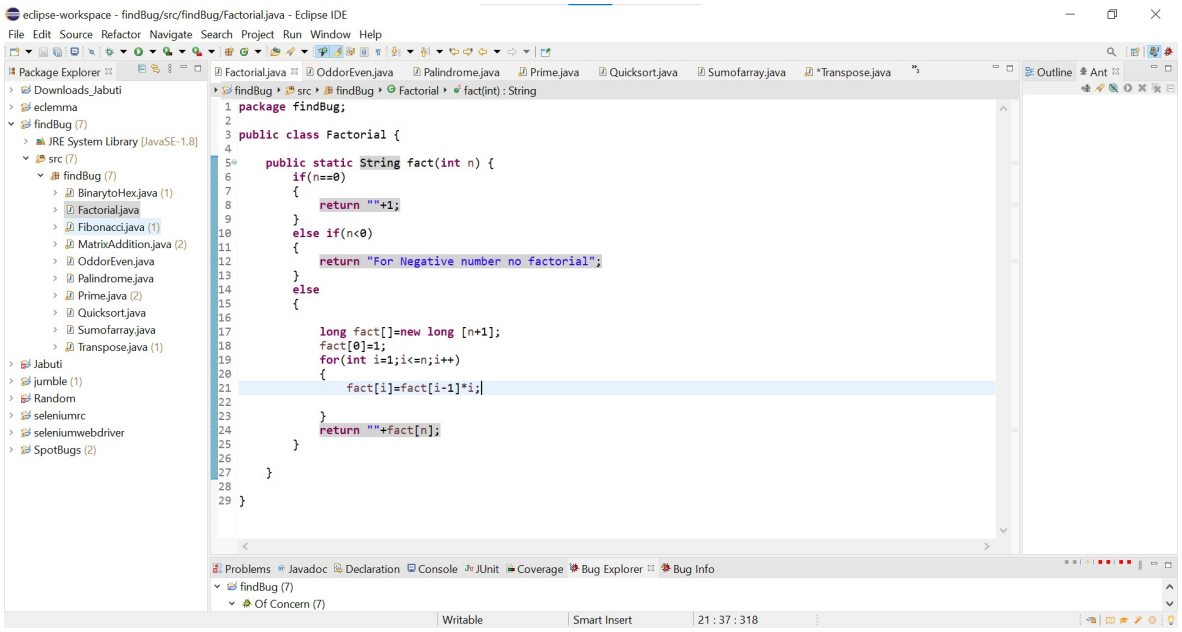

Figure 1: Findbug Screenshot

1.2 Write a program to generate Fibonacci numbers.

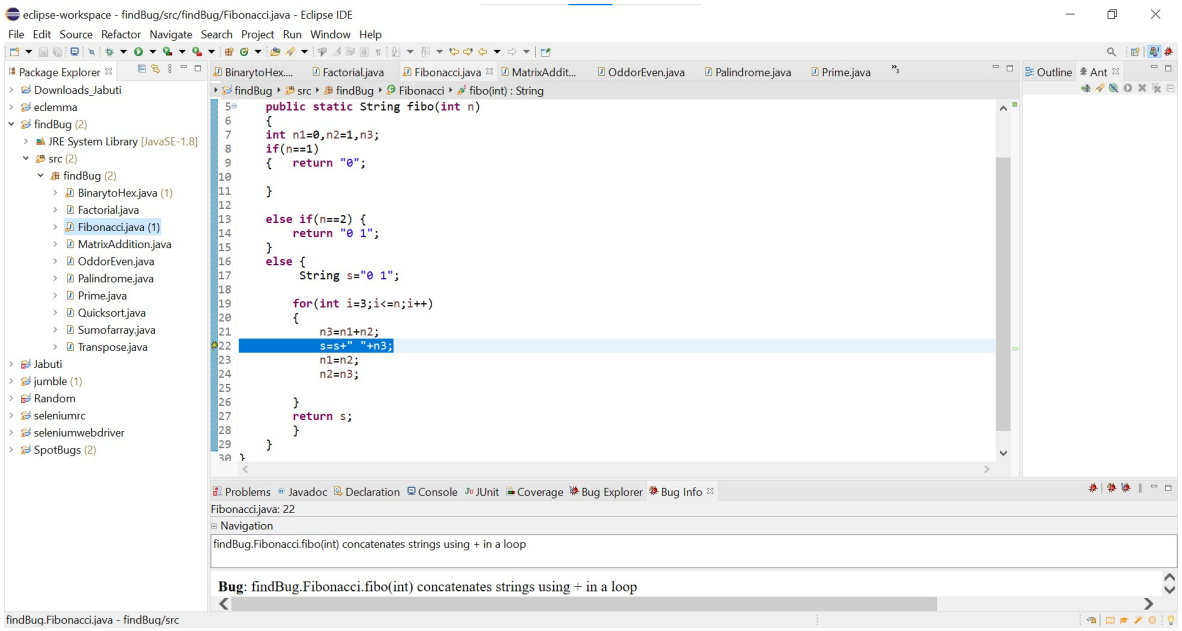

Figure 2: Findbug Screenshot

1.3 Write a program that performs sorting of a group of integer values using the quick sort technique.

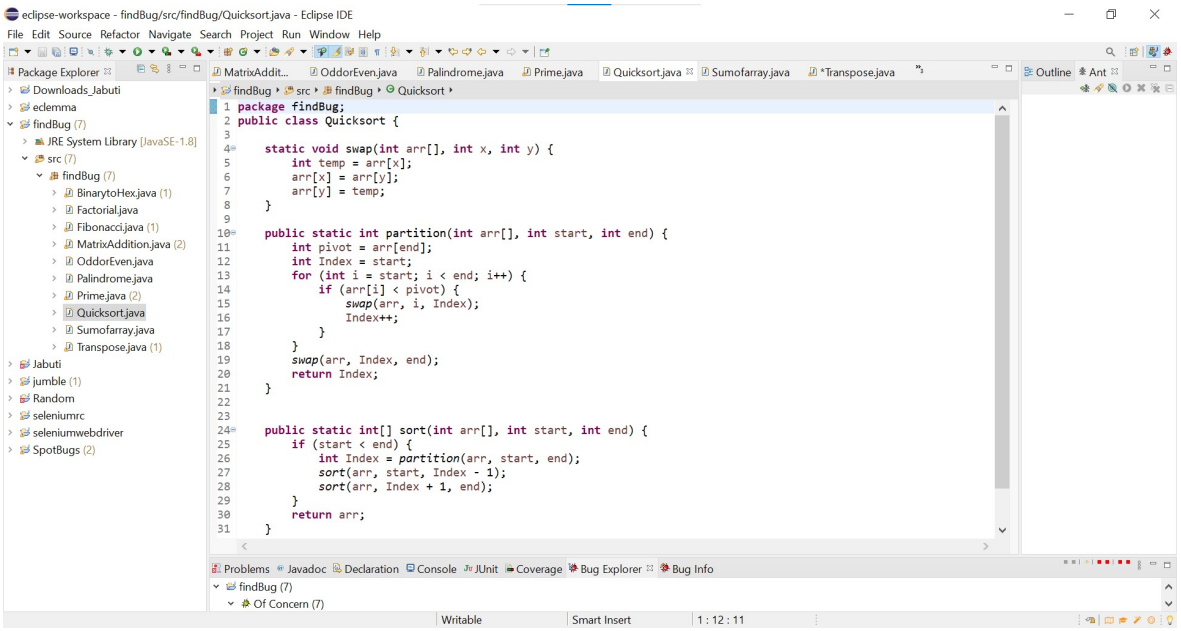

Figure 3: Findbug Screenshot

1.4 Write a program that accepts elements of a matrix and displays its transpose.

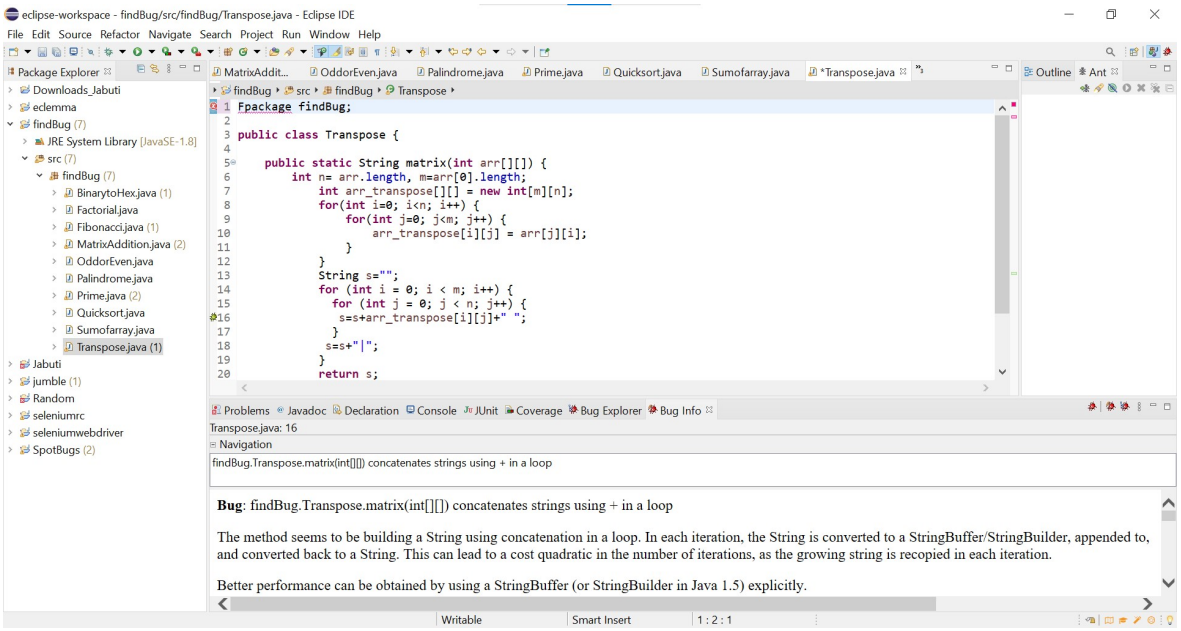

Figure 4: Findbug Screenshot

1.5 Write a program to add two matrices and display the sum matrix.

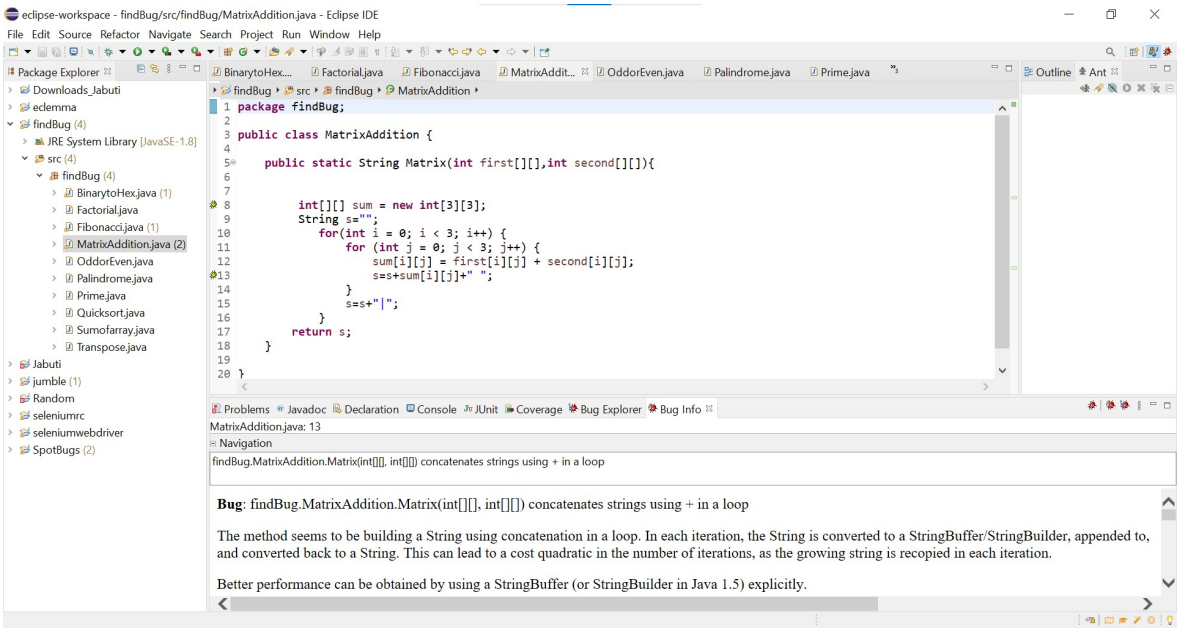

Figure 5: Findbug Screenshot

1.6 Write a program to Print Prime Numbers from 1 to 100 using Scanner Class and For Loop.

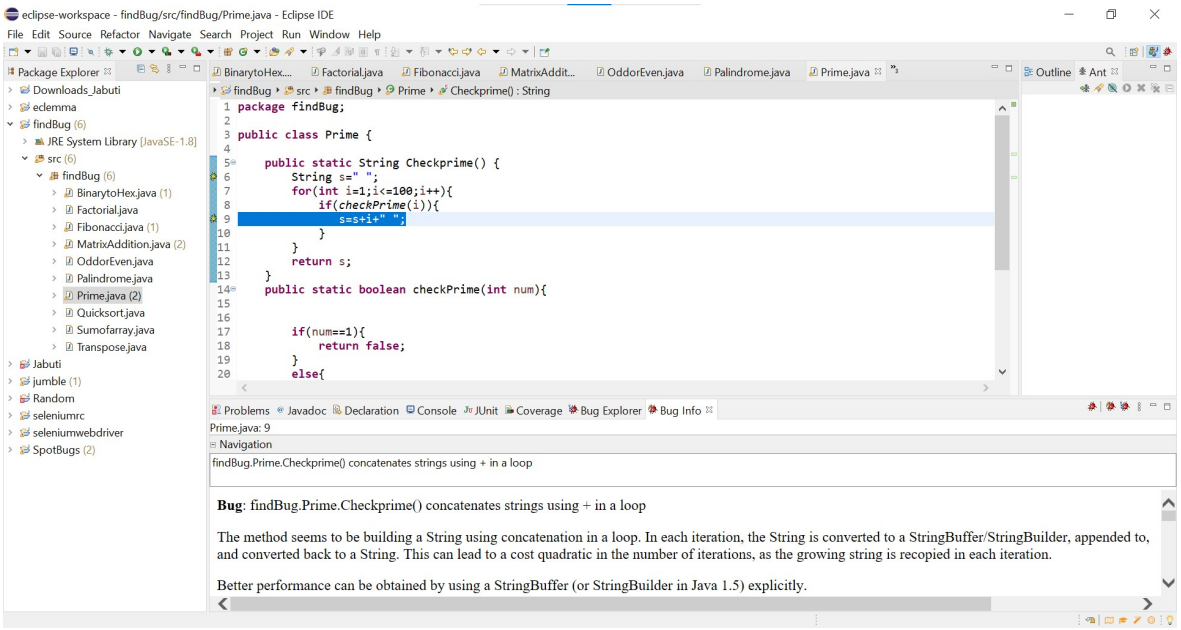

Figure 6: Findbug Screenshot

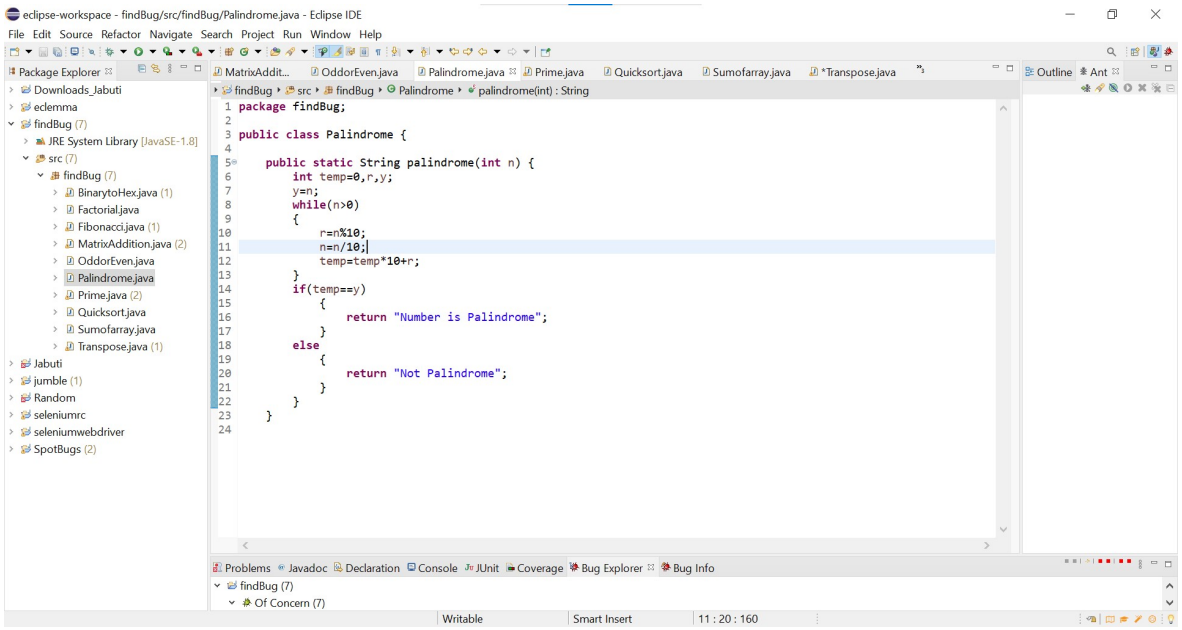

Figure 7: Findbug Screenshot

1.7 Write a program to generate a palindrome of numbers.

1.8 Write a program to find out the sum of two arrays.

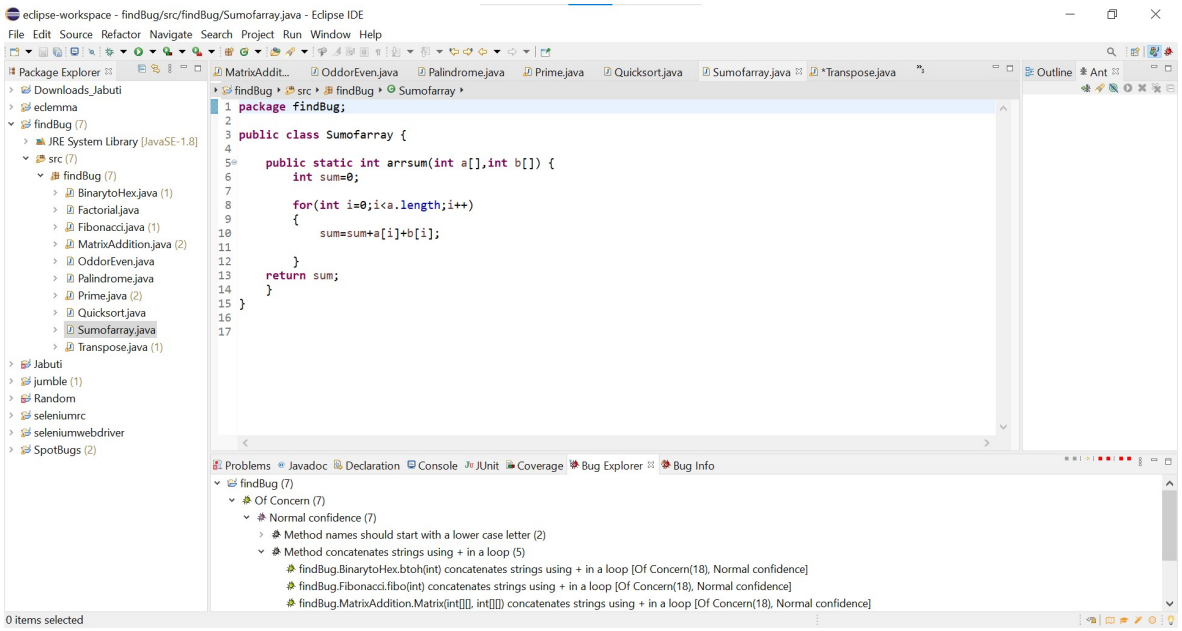

Figure 8: Findbug Screenshot

1.9 Write a program to check whether the number is even or odd.

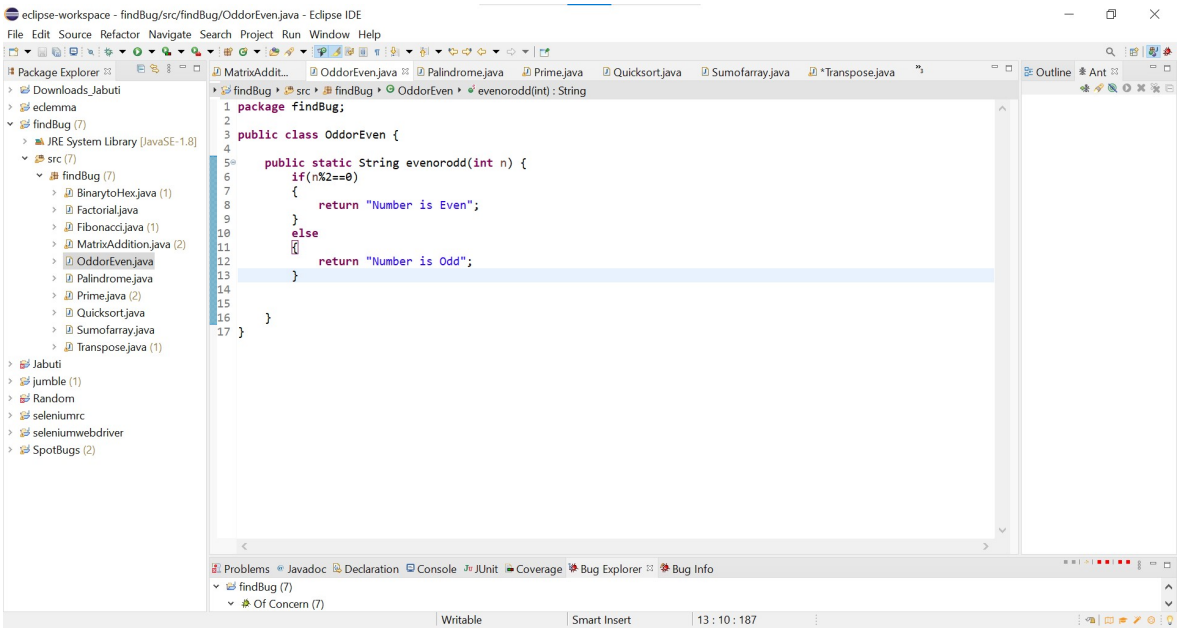

Figure 9: Findbug Screenshot

1.10 Write a program for binary to hexadecimal conversion.

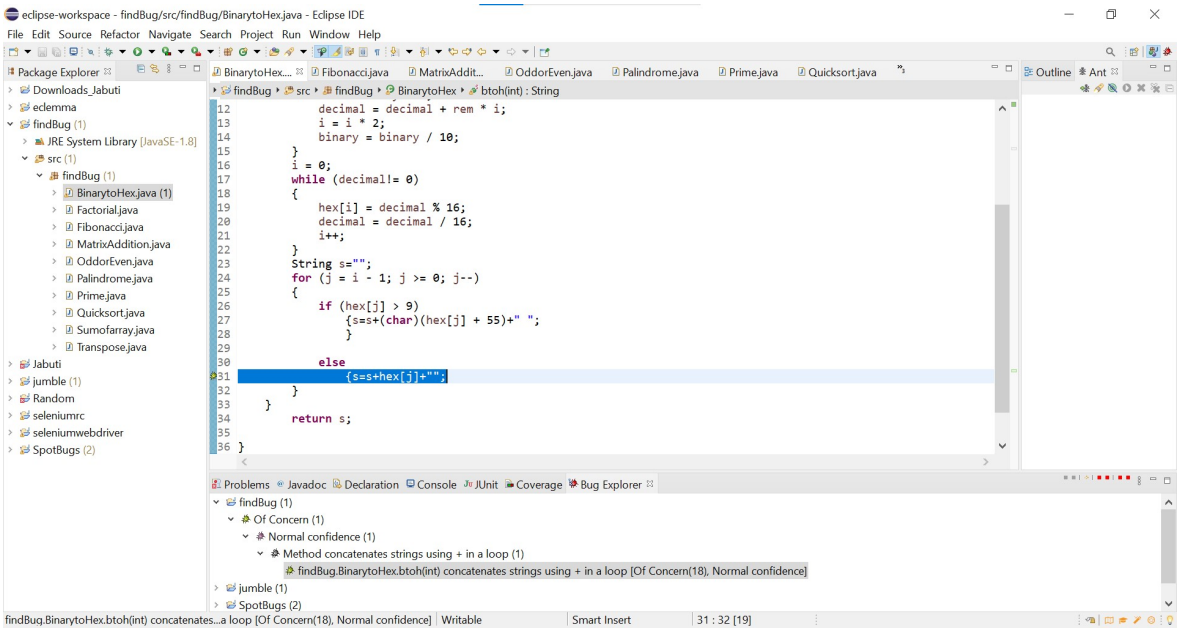

Figure 10: Findbug Screenshot