Nathan Spangler

CS 1632 - DELIVERABLE 6: Static Analysis of the Sieve of Eratosthenes

https://github.com/njs55/Nathan_Spangler_CS1632_QA_Deliverables/tree/master/Deliverable6

SUMMARY

FindBugs

- Exception created and dropped rather than thrown
  - Fixed this bug by adding "*throw*" in front of "*new IllegalArgumentException();*"
- Nullcheck of value previously dereferenced
  - Changed "*if (results.length == 0 || results != null) {}*" to "*if (results != null) {}*"
- The class name sieve doesn't start with an upper case letter
  - Changed the class name and file name to "*Sieve*"
- The method name sieve.PrintSieve(int[]) doesn't start with a lower case letter
  - Change "*PrintSieve*" to "*printSieve*"
- Method invokes ineffeicient Number constructor; use static valueOf instead (convertResults)
  - In sieve.convertResults(), I changed "*actual.add(new Integer(j + 1));*" to "*actual.add(Integer.valueOf(j + 1));"*

CheckStyle

- Local var iable name 'c' must match pattern '^[a-z][a-z0-9][a-zA-Z0-9]*$'. [LocalVariableName]
  - Changed '*c*' to '*charHolder*' in *printsieve(int[],Boolean[])* even though the method is unused.
- First sentence of Javadoc is incomplete (period is missing) or not present. [SummaryJavadoc]
  - Added a sentence with a period to the Javadoc comment before the *getTrueArray()* method
- Parameter name 's' must match pattern '^[a-z][a-z0-9][a-zA-Z0-9]*$'. [ParameterName]
  - Changed '*s*' to '*size'* in *getTrueArray()* method
- Array brackets at illegal position. [ArrayTypeStyle]
  - Changed "*boolean toReturn[] = new boolean[size];*" to "*Boolean[] toReturn = new boolean[size];"* in the getTrueArray() method.
- Array brackets at illegal position. [ArrayTypeStyle]
  - Changed "*convertResults(int[] results, boolean prime[])"* to "*convertResults(int[] results, Boolean[] prime)"*
- Empty else block. [EmptyBlock]
  - Deleted an extra else{} statement within the *calculateMax*() method.
- Catching 'Exception' is not allowed. [IllegalCatch]
  - Removed the *TryCatch* statement in main and only called the *calculateMax*() method. Then in the *calculateMax*() method I replaced the "*throw new IllegalArgumentException();"* statements with the print statements found in the *TryCatch* that I removed as well as set the max (return value) to 100.

I first ran the FindBugs GUI and fixed all the bugs accordingly. I then wrote Unit Tests for the calculateMax() method because the method caused a defect visible to the user. I then finished up with fixing the issues that CheckStyle found. After completing the fixes for CheckStyle I noticed that 2 of my unit tests were now failing. The reason they were failing was because I was checking to see if the *IllegalArgumentException();* was thrown or not. And after fixing the CheckStyle issues I ended up deleting the code that threw these exceptions. But I then realized that my unit tests should have never been testing to see if an exception was thrown. They should have been testing to make sure the max value was set to 100. However, my concern is that I still changed the behavior of the method, even though the functionality of the code has not changed.

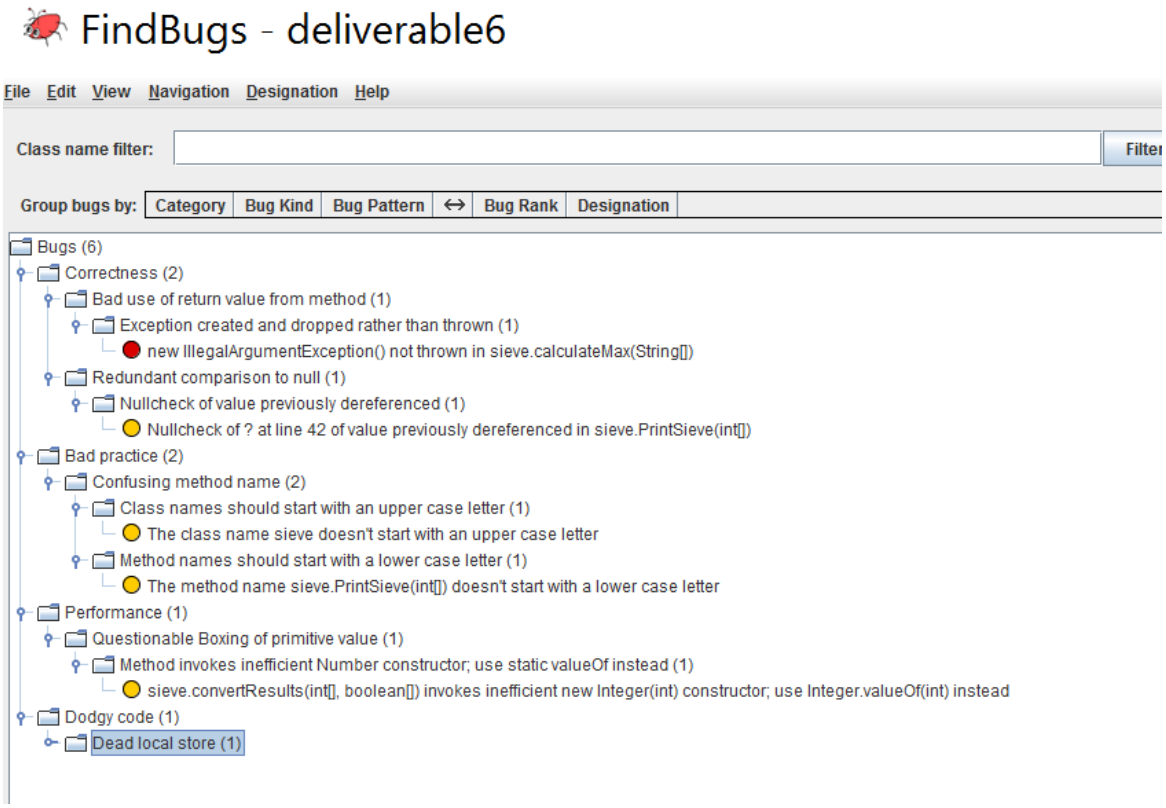
Code can be found:
https://github.com/njs55/Nathan_Spangler_CS1632_QA_Deliverables/tree/master/Deliverable6

OR

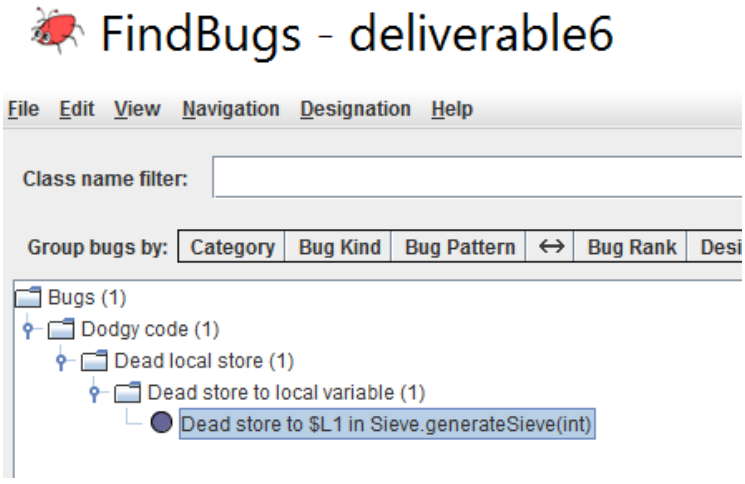
https://github.com/njs55/bug-fodder

SCREENSHOTS

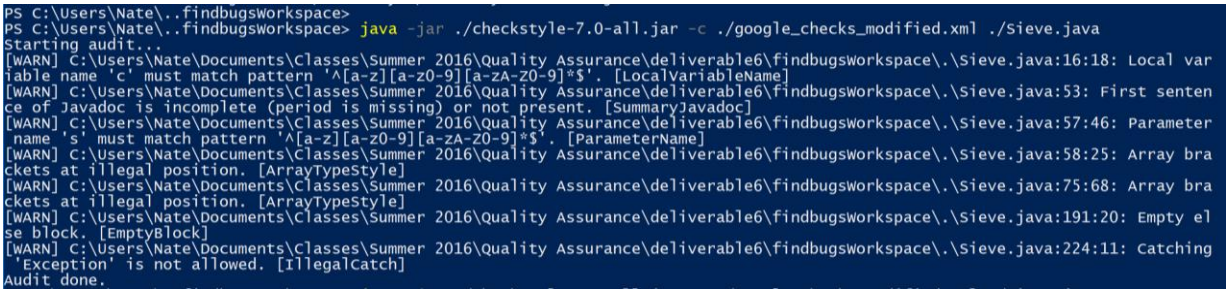
FindBugs untouched.



FindBugs after 5 Bugs were fixed.



CheckStyle results after performing FindBugs fixes.



CheckStyle results after fixing all issues CheckStyle found above.