Assignment on FindBugs

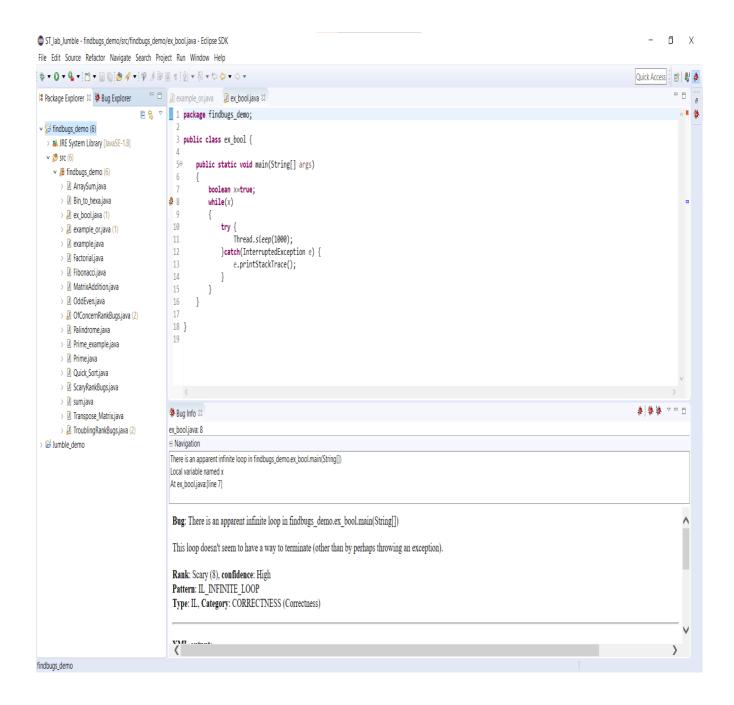
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After executing FindBugs on the package, total 6 bugs were found.



Note: -

- I. Default settings used for FindBugs in the preferences.
- II. Most of the program did not have any bugs.
- III. Some programs had bugs which were resolved.
- IV. Not all bugs could be resolved.

1. Boolean

```
_ _
Package Explorer 

□ W Bug Explorer
                                        1 package findbugs_demo;
3 public class ex_bool {
   > A JRE System Library [JavaSE-1.8]
                                          4
  5⊜
                                                public static void main(String[] args)

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    # findbugs_demo (6)

                                          6
       > 🗾 ArraySum.java
                                          7
                                                   boolean x=true;
       > Din_to_hexa.java
                                         8
                                                   while(x)
       > 🕖 ex_bool.java (1)
                                          9
                                         10
                                                       try {
       > 🕖 example_or.java (1)
                                         11
                                                           Thread.sleep(1000);
       > 🗓 example.java
                                         12
                                                       }catch(InterruptedException e) {
       > 1 Factorial.java
                                         13
                                                           e.printStackTrace();
       > Fibonacci.java
                                         14
       > <a> MatrixAddition.java</a>
                                         15
                                                   }
       16
       > 🕖 OfConcernRankBugs.java (2)
                                         17
                                         18 }
       > Palindrome.java
                                         19
       > I Prime_example.java
       > I Prime.java
       > Quick_Sort.java
       > 🗾 sum.java

₱ Bug Info 

□
       > I Transpose_Matrix.java
                                        ex_bool.java: 8
       > 🕖 TroublingRankBugs.java (2)
                                        ■ Navigation
 > 📂 Jumble_demo
```

Details of Bug found -

Bug: There is an apparent infinite loop in findbugs demo.ex bool.main(String[])

This loop doesn't seem to have a way to terminate (other than by perhaps throwing an exception).

Rank: Scary (8), confidence: High Pattern: IL INFINITE LOOP

Type: IL, Category: CORRECTNESS (Correctness)

This bug was resolved by changing loop condition.

```
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☐ Package Explorer ☐ ☐ ☐ Bug Explorer
                                         🔝 example_or.java 🗈 ex_bool.java 🛭 🚨 OfConcernRankBugs.java
                                           1 package findbugs_demo;
3 public class ex_bool {
  > Mark JRE System Library [JavaSE-1.8]
  🕶 🕮 src (4)
                                                   public static void main(String[] args)
    🗸 🔠 findbugs_demo (4)
      > 🗾 ArraySum.java
                                                       int x=5;
       > 🗓 Bin_to_hexa.java
                                                       while(x<10)
       > 🗓 ex_bool.java
                                                       {
                                           10
       > 🔑 example_or.java
                                                           try {
       > 🛭 example.java
                                                               Thread.sleep(1000);
       > 🛭 Factorial.java
                                                           }catch(InterruptedException e) {
       > 🛭 Fibonacci.java
                                                               e.printStackTrace();
       > 🗓 MatrixAddition.java
       > 🛭 OddEven.java
       > 🕖 OfConcernRankBugs.java (2)
                                                           X++;
       > 🛭 Palindrome.java
       > Prime_example.java
                                           20
       > 🛭 Prime.java
                                           21 }
       22
       > 🚺 ScaryRankBugs.java
```

2. Or example

```
🗀 🖟 *example_or.java 🛭 🔑 ex_bool.java
☐ Package Explorer 🖾 🔆 Bug Explorer
                                          1 package findbugs_demo;
3 public class example_or {
  > Marcon JRE System Library [JavaSE-1.8]
                                           4⊖ @SuppressWarnings("unused")
  private static byte char64(char x) {
    findbugs_demo (6)
                                                   byte index[] = null;
      ArraySum.java
                                                       if ((int)x < 0 \mid | (int)x > index.length)
      Din_to_hexa.java
                                                         return -1;

> A ex_bool.java (1)

                                                         return index[(int)x];
                                            10
      > 🕖 example_or.java (1)
      > 👤 example.java
                                            12 }
      > 🛭 Factorial.java
      > 🛭 Fibonacci.java
      > 

MatrixAddition.java
      > 🛭 OddEven.java
      > 🕖 OfConcernRankBugs.java (2)
      > 🗾 Palindrome.java
      > Prime_example.java
      > 🗾 Prime.java
      >  Quick_Sort.java
      → J sum.iava

₱ Bug Info 

□
      > In Transpose Matrix, iava
      > 🕖 TroublingRankBugs.java (2)
                                           example or.java: 7
> 🔀 Jumble demo
                                           ■ Navigation
                                           Bad comparison of nonnegative value with 0 in findbugs_demo.example_or.char64(char)
                                           Local variable named x
```

The details of the Bug found is -

Bug: Bad comparison of nonnegative value with 0 in findbugs_demo.example_or.char64(char)

This code compares a value that is guaranteed to be non-negative with a negative constant or zero.

Rank: Scary (7), confidence: Normal

Pattern: INT BAD COMPARISON WITH NONNEGATIVE VALUE

Type: INT, Category: CORRECTNESS (Correctness)

The bug was resolved -

```
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                                      Package Explorer 

□ W Bug Explorer
                                               1 package findbugs_demo;
3 public class example_or {
   > A JRE System Library [JavaSE-1.8]
                                              4⊖
                                                     @SuppressWarnings("unused")
  private static byte char64(char x) {

√ 

# findbugs_demo (5)

                                                          byte index[] = null;
       > 🛭 ArraySum.java
                                             % 7
                                                          if ((int)x < 1 \mid | (int)x > index.length)
       > 🛭 Bin_to_hexa.java
                                                              return -1;
       → 🔑 ex_bool.java (1)
                                               9
                                                            return index[(int)x];
                                              10
       > 🕖 example_or.java
                                              11
       > 🛭 example.java
                                              12 }
       > 🛭 Factorial.java
                                              13
       > 🛭 Fibonacci.java
       > <a> MatrixAddition.java</a>
       > 🗾 OddEven.java
       > 🕖 OfConcernRankBugs.java (2)
       > 🛭 Palindrome.java
       > Prime_example.java
       > 🛭 Prime.java
       > Quick_Sort.java
       > I ScaryRankBugs.java
```

After resolving all the bugs and executing FindBugs -

