

### **Code Injection 1:**

File: UserByNameComparator.java

Line: 35

Injection: In the if statement change '==' to '!='.

Expected Test Failure: Test 25

Outcome before error:

### **Test ID 25**

- Requirements: Tests if two Users are the same
- Component: UserByNameComparator.java
- Method: compare(User user1, User user2)
- Test Input: 1 1
- Expected Outcome: 1
- Actual Outcome: 1

Passed

Outcome after error:

### **Test ID 25**

- Requirements: Tests if two Users are the same
- Component: UserByNameComparator.java
- Method: compare(User user1, User user2)
- Test Input: 1 1
- Expected Outcome: 1
- Actual Outcome: -1

Failed

### **Code Injection 2:**

File: DoubleRange.java

Line: 120

Injection: In the if statement change '<=' to '>='.

Expected Test Failure: Test 13

Outcome before error:

### **Test ID 13**

- Requirements: Test inputs a double and checks if the given double is inside the range.
- Component: DoubleRange.java
- Method: contains(double d)

- Test Input: 20.9
- Expected Outcome: true
- Actual Outcome: true

Passed

Outcome after error:

### **Test ID 13**

- Requirements: Test inputs a double and checks if the given double is inside the range.
- Component: DoubleRange.java
- Method: contains(double d)
- Test Input: 20.9
- Expected Outcome: true
- Actual Outcome: false

Failed

### **Code Injection 3:**

File: Format.java

Line: 37

Injection: In the if statement change '==' to '!='.

Expected Test Failure: Test 22

Outcome before error:

### **Test ID 22**

- Requirements: Tests the format method when a null value is passed as an argument
- Component: Format.java
- Method: format(double d)
- Test Input: null
- Expected Outcome: ""
- Actual Outcome: ""

Passed

Outcome after error:

Method fails to complete

Exception in thread "main" java.lang.NullPointerException  
at org.openmrs.util.Format.formatPercentage(Format.java:40)

```
at org.openmrs.Test21.main(Test21.java:17)
Exception in thread "main" java.lang.NullPointerException
at org.openmrs.util.Format.formatPercentage(Format.java:40)
at org.openmrs.Test21.main(Test21.java:17)
```

#### **Code Injection 4:**

File: Format.java

Line: 45

Injection: In the return statement change 'return " " + (d) to 'return " + (d)''.

Expected Test Failure: Test 23

Outcome before error:

#### **Test ID 23**

- Requirements: Tests the format method when a double is passed as an argument
- Component: Format.java
- Method: format(double d)
- Test Input: 0.98
- Expected Outcome: 0.98
- Actual Outcome: 0.98

Passed

Outcome after error:

#### **Test ID 23**

- Requirements: Tests the format method when a double is passed as an argument
- Component: Format.java
- Method: format(double d)
- Test Input: 0.98
- Expected Outcome: 0.98
- Actual Outcome: + (d)

Failed

#### **Code Injection 5:**

File: DoubleRange.java

Line: 133

Injection: In the final return statement change 'true' to 'false'

Expected Test Failure: Test 16

Outcome before error:

**Test ID 16**

- Requirements: Test inputs a double and checks if the given double is the same as the minimum if it is considered inside the range.
- Component: DoubleRange.java
- Method: contains(double d)
- Test Input: 10.0
- Expected Outcome: true
- Actual Outcome: true

Passed

Outcome after error:

**Test ID 16**

- Requirements: Test inputs a double and checks if the given double is the same as the minimum if it is considered inside the range.
- Component: DoubleRange.java
- Method: contains(double d)
- Test Input: 10.0
- Expected Outcome: true
- Actual Outcome: false

Failed

As expected, only tests that called methods with injected errors were changed, all other tests remained the same as before.