SENG3320/6320 Software Verification and Validation

Semester 1, 2022  
SENG 3320 Assignment 1 Test Report

## Test environment: Task1: Blackbox Testing Test objective:

Testing the contructor method BigInteger(int signum, byte[] magnitude)

|  |  |  |  |
| --- | --- | --- | --- |
| signum | Empty byte array | Byte array full of zeros | Byte array with at least one non zero value |
| -2 | NumberFormatException | NumberFormatException | NumberFormatException |
| -1 | Result value is zero | Result value is zero | Test for value |
| 0 | Result value is zero | Result value is zero | NumberFormatException |
| 1 | Result value is zero | Result value is zero | Test for value |
| 2 | NumberFormatException | NumberFormatException | NumberFormatException |

## test cases: test results: test coverage:

## Test objective:

Testing the contructor method BigInteger(String value, int radix)

## test cases:

Radix may be <2 in range or >36

String can contain +- or neither as beginning symbol

String contains plain illegal characters (not alphanumeric or +/- not at front) or not

String contains alphanumeric above radix (for instance base 16 cannot contain a g but may contain an f)

## test results: test coverage:

## Test objective: test cases: test results: test coverage:

Task2: White-box Testing: Structural Testing  
Test objective:  
  
test cases:   
  
test results:  
  
test coverage:

Task3: White-box Testing: Data Flow Testing   
  
Method: public BigInteger gcd(BigInteger y)



1. Identify all the definition-use pairs (du-pairs) (5 marks)

Identifying du-pairs – variable **xval** :  
  
all-defs: 1, 8, 9  
all-uses:3, <3,5>, <3,6>, 6, <6,7>, <6,8>, 7, <7,9>, <7,10>, 9 , 12 , 16  
p-use: 3, <3,5>, <3,6>, 6, <6,7>, <6,8>, 7 , <7,9>, <7,10> ,

|  |  |
| --- | --- |
| Du-pair | Path(s) |
| (1, 9) | <1,2,3,6,7,9> |
| (1,12) | <1,2,3,6,7,10,12> |
|  | <1,2,3,6,7,9,10,12> |
|  | <1,2,3,6,7,9,10,11,12> |
| (1,16) | <1,2,4,16> |
|  | <1,2,4,13,15,16> |
|  | <1,2,3,6,8,4,16> |
|  | <1,2,3,6,8,4,13,15,16> |
| (8, 9) | No path |
| (8, 12) | No path |
| (8, 16) |  |
|  |  |

2) Design test cases to achieve All-Defs coverage (4 marks)

3) Design test cases to achieve All-Uses coverage (6 marks)

4) Write and execute the test cases in JUnit. (3 marks)

# work performed by each group member:

|  |  |  |
| --- | --- | --- |
| Tasks | Completion Date | Member |
|  | | |
| Initial Required classes of the entire Java project | 01/04/2022 | Ni Zeng |
| Initial test report template | 01/04/2022 |
| Task3:  public BigInteger gcd(BigInteger y) |  |
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|  |  | Austin Baxter |
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| Task 1 part 1 test method complete | 17/04/2022 | Brandon Allen |
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|  | | |
|  |  | Kyle Beattie |
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|  |  | Kelsey Baker |
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