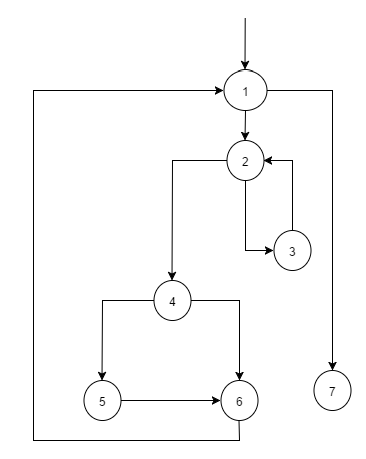
1. **Q5 from Chapter 2, Section 2.2.1, page 43 of your textbook.**

**a)**



b)

|  |  |
| --- | --- |
|  | Test Requirement (TR) |
| A | [1,2,3] |
| B | [1,2,4] |
| C | [2,3,2] |
| D | [2,4,5] |
| E | [2,4,6] |
| F | [3,2,3] |
| G | [3,2,4] |
| H | [4,5,6] |
| I | [4,6,1] |
| J | [5,6,1] |
| K | [6,1,2] |
| L | [6,1,7] |
| M | [1,7] |

c)

t0 = [1,2,4,5,6,1,7] covers B, D, H, J, L

t1 = [1,2,3,2,4,6,1,7] covers A,C, G, E, I, L

Edge pair TRs’ F[3,2,3], K[6,1,2] and M[1,7] are not toured by any of the test paths.

d)

The test path does not tour the simple path [3, 2, 4, 5, 6] directly. It tours with a sidetrip [4, 6, 1, 2, 4].

e)

Node Coverage test requirements = {1, 2, 3, 4, 5, 6, 7}

Edge coverage requirements = {(1, 2,), (1, 7), (2, 3), (2, 4), (3, 2), (4, 5), (4, 6), (5, 6), (6, 1)} .

Prime path coverage requirements =

1. [1,2,4,6,1] ,
2. [1,2,4,5,6,1] ,
3. [2,3,2],
4. [2,4,6,1,2],
5. [2,4,5,6,1,2] ,
6. [3,2,3],
7. [3,2,4,6,1,7],
8. [3,2,4,5,6,1,7],
9. [4,5,6,1,2,4] ,
10. [4,5,6,1,2,3] ,
11. [4,6,1,2,4] ,
12. [4,6,1,2,3] ,
13. [5,6,1,2,4,5],
14. [6,1,2,4,5,6] ,
15. [6,1,2,4,6] ,

f)

Test path [1,2,3,2,4,5,6,1,7] fulfills node coverage , but does not cover (4,6) .

g)

[1,2,3,2,4,5,6,1,7] , [1,2,4,6,1,7] covers Edge coverage requirement A-L, but does not cover PPC requirement 6,9,10,11,12,13,14,15 .

**2. Q7 from Chapter 2, Section ~~2.2.3~~ 2.3, pp. 63-65 of your textbook.**

**a)**

C:\Users\skshimon\Dropbox\Spring 2016\CS580 A5\Homework\a3\Q7_New_2.png

b)

line 16, replace while(numPrimes < n) with while(numPrimes < 3) . This would be detected by n = 3 but not by n = 5.

c)

For test case n = 1, the body of the while loop is skipped.

d)

Node coverage TR = {0,1,2,3,4,5,6,7,8,9,10,11,12}

Edge coverage TR = {

(0,1),

(1,2),

(2,3),

(3,4),

(4,5),

(4,6),

(6,3),

(3,7),

(5,7),

(7,8),

(7,1) ,

(8,1),

(1,9),

(9,10),

(10,11),

(11,10),

(10,12)

}

Prime Path coverage TR ={

[0,1,2,3,4,5,7,8],

[0,1,2,3,7,8],

[0,1,2,3,4,6],

[0,1,9,10,11],

[0,1,9,10,12],

[1,2,3,4,5,7,8,1],

[1,2,3,4,5,7,1],

[1,2,3,7,8,1],

[1,2,3,7,1],

[10,11,10],

[11,10,12],

[11,10,11],

[2,3,4,5,7,8,1,9,10,12],

[2,3,4,5,7,8,1,9,10,11],

[2,3,4,5,7,1,9,10,11],

[2,3,4,5,7,1,9,10,12],

[2,3,7,8,1,9,10,12],

[2,3,4,5,7,8,1,2],

[2,3,7,8,1,9,10,11],

[2,3,4,5,7,1,2],

[2,3,7,1,9,10,12],

[2,3,7,1,9,10,11],

[2,3,7,8,1,2],

[2,3,7,1,2],

[3,4,5,7,8,1,2,3],

[3,4,5,7,1,2,3],

[3,7,8,1,2,3],

[3,7,1,2,3],

[3,4,6,3],

[4,6,3,7,8,1,9,10,11],

[4,6,3,7,8,1,9,10,12],

[4,5,7,8,1,2,3,4],

[4,6,3,7,1,9,10,12],

[4,6,3,7,1,9,10,11],

[4,5,7,1,2,3,4],

[4,6,3,7,8,1,2],

[4,6,3,7,1,2],

[4,6,3,4],

[5,7,8,1,2,3,4,5],

[5,7,8,1,2,3,4,6],

[5,7,1,2,3,4,6],

[5,7,1,2,3,4,5],

[6,3,4,5,7,8,1,9,10,11],

[6,3,4,5,7,8,1,9,10,12],

[6,3,4,5,7,1,9,10,12],

[6,3,4,5,7,1,9,10,11],

[6,3,4,5,7,8,1,2],

[6,3,4,5,7,1,2],

[6,3,4,6],

[7,8,1,2,3,4,5,7],

[7,1,2,3,4,5,7],

[7,8,1,2,3,7],

[7,1,2,3,7],

[8,1,2,3,4,5,7,8],

[8,1,2,3,7,8],

}

e)

[0,1,2,3,4,6,3,4,5,7,8,1,9,10,11,10,12] does not achieve edge coverage but achieves node coverage.

f)

test path [0,1,2,3,7,1,2,3,4,6,3,4,5,7,8,1,9,10,11,10,12] tours all edges,

test path [0,1,2,3,7,9,1,2,3,4,6,3,4,5,7,8,9,1,10,11,12,11,13] tours all the edges, but does not cover prime path [0,1,9,10,12] .

1. **Using your code from A1, measure code coverage in the form of statement, branch, and method coverage using any Java code coverage analysis tool of your choice.**

