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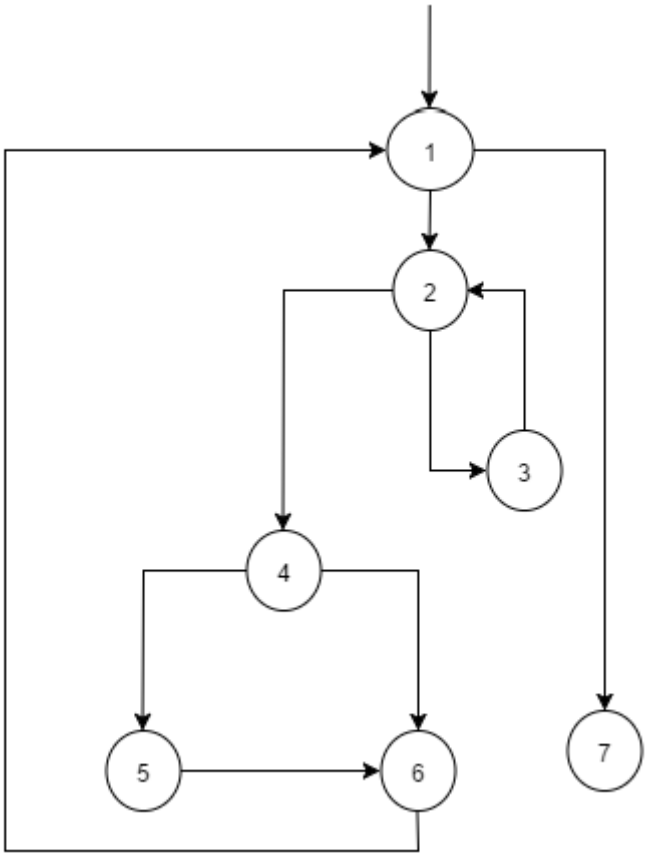
1. **Q5 from Chapter 2, Section 2.2.1, page 43 of your textbook.**

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)

t_0 = [1,2,4,5,6,1,7] covers B, D, H, J, L

t_1 = [1,2,3,2,4,6,1,7] covers A,C, G, E, I, L

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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 .

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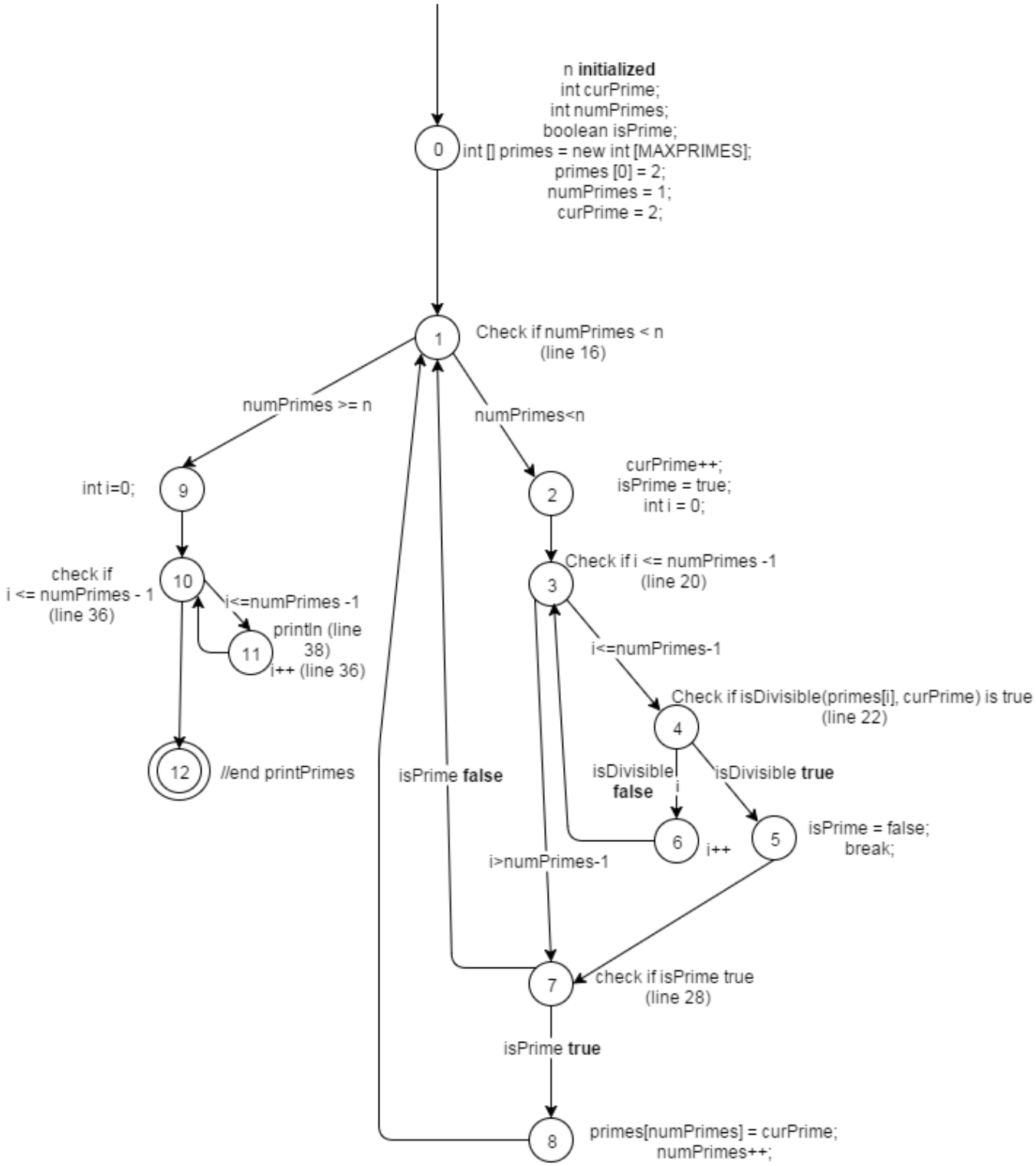
2. Q7 from Chapter 2, Section ~~2.2.3~~ 2.3, pp. 63-65 of your textbook.

a)



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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],

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[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] .

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3. 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.

Counter	Coverage	Covered	Missed	Total
Instructions	89.9 %	753	85	838
Branches	99.0 %	101	1	102
Lines	89.2 %	165	20	185
Methods	77.8 %	14	4	18
Types	100.0 %	3	0	3
Complexity	92.8 %	64	5	69