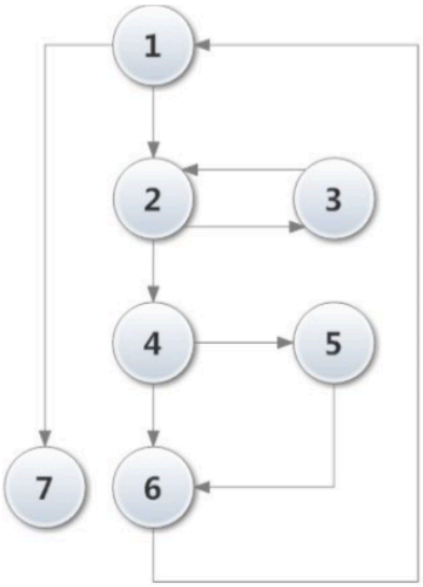
Software Testing

Homework1 Solution

2.2.1 Q5 (Page 43)

a)



b) The edge pairs are: {[1, 2, 3], [1, 2, 4], [2, 3, 2], [2, 4, 5], [2, 4, 6], [3, 2, 3], [3, 2, 4], [4, 5, 6], [4, 6, 1], [5, 6, 1], [6, 1, 2], [6, 1, 7]}.

c) No. Neither t0 nor t1 tours the following edge-pairs: {[3, 2, 3], [6, 1, 2]}.

d) Not directly. Yes, with sidetrip [4, 6, 1, 2, 4] (or [6, 1, 2, 4] or [4, 6, 1, 2] or [6, 1, 2]).

e)

Node Coverage: {1, 2, 3, 4, 5, 6, 7}.
Edge Coverage: {(1,2), (1,7), (2,3), (2,4), (3,2), (4,5), (4,6), (6,1), (5,6)}.
Prime Path Coverage: {[1, 2, 4, 5, 6, 1], [1, 2, 4, 6, 1], [2, 4, 6, 1, 2], [2, 4, 5, 6, 1, 2], [3, 2, 4, 6, 1, 7], [3, 2, 4, 5, 6, 1, 7], [4, 6, 1, 2, 4], [4, 5, 6, 1, 2, 4], [4, 6, 1, 2, 3], [4, 5, 6, 1, 2, 3], [5, 6, 1, 2, 4, 5], [6, 1, 2, 4, 6], [6, 1, 2, 4, 5, 6], [3, 2, 3], [2, 3, 2]}.

f) [1, 2, 3, 2, 4, 5, 6, 1, 7] (does not cover edge (4, 6))

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

2.2.1 Q6 (Page 43)

a)

$\underline{TR_{NC}} = \{n_0, n_1, n_2, n_3, n_4, n_5, n_6, n_7, n_8, n_9\}$.
$\underline{TR_{EC}} = \{(n_0, n_3), (n_0, n_4), (n_1, n_4), (n_2, n_5), (n_2, n_6), (n_3, n_7), (n_4, n_7), (n_4, n_8), (n_5, n_1), (n_5, n_9), (n_6, n_9), (n_8, n_5)\}$.
$\underline{TR_{PPC}} = \{ [n_0, n_3, n_7], [n_0, n_4, n_7], [n_0, n_4, n_8, n_5, n_1], [n_0, n_4, n_8, n_5, n_9], [n_1, n_4, n_8, n_5, n_1], [n_1, n_4, n_8, n_5, n_9], [n_2, n_5, n_1, n_4, n_7], [n_2, n_5, n_1, n_4, n_8], [n_2, n_5, n_9], [n_2, n_6, n_9], [n_4, n_8, n_5, n_1, n_4], [n_5, n_1, n_4, n_8, n_5], [n_8, n_5, n_1, n_4, n_7], [n_8, n_5, n_1, n_4, n_8] \}$.

b)

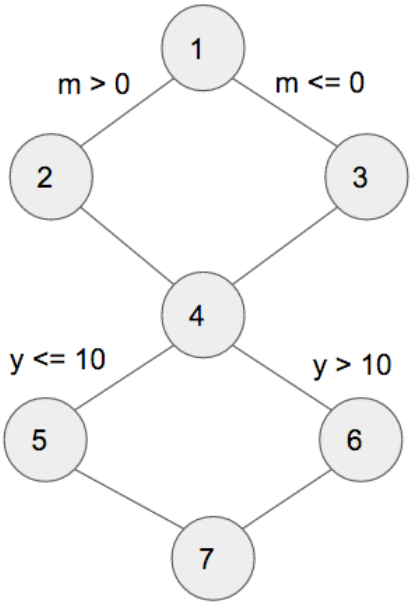
$\underline{T_{NC}} = \{[n_0, n_3, n_7], [n_1, n_4, n_8, n_5, n_9], [n_2, n_6, n_9]\}$. (Other answers are possible.)

c)

$\underline{T_{EC}} = \{[n_0, n_3, n_7], [n_1, n_4, n_8, n_5, n_9], [n_2, n_6, n_9], [n_0, n_4, n_7], [n_2, n_5, n_1, n_4, n_7]\}$. (Other answers are possible.)

2.3 Q1 (Page 60-61)

a)



b) Node 1, 2 and 3.

c) Node 2, 3 and 7.

d) No, because any Node 2 or Node 3 will re-define variable w and there is no def-clear path from Node 1 to Node 7.

e)

du-path(w) = {[1, 2], [1, 3], [2, 4, 5, 7], [2, 4, 6, 7], [3, 4, 5, 7], [3, 4, 6, 7]}
du-path(x) = {[5, 7], [6, 7]}