**SYSC 4101: Lab 6**

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Exercise 1

1. A diagram of a graph

   Description automatically generatedFirst program:
2. Second program:

A diagram of a diagram

Description automatically generated

Exercise 2

1. Round trips:

[(2, 3, 5, 6, 2), (2, 3, 4, 6, 2), (6, 2, 3, 4, 6), (6, 2, 3, 5, 6)]

1. Simple-Round-Trip test requirements

TR = [(2, 3, 5, 6, 2), (2, 3, 4, 6, 2), (6, 2, 3, 4, 6), 6, 2, 3, 5, 6)]

1. Simple-Round-Trip test paths

TP = [(1, 2, 3, 5, 6, 2, 7), (1, 2, 3, 4, 6, 2, 7)]

1. No, since it does not include every round trip in the graph. The following test paths are missing: [(6, 2, 3, 4, 6), 6, 2, 3, 5, 6)]
2. All-Defs test requirements:

For var x: TR = [(1, 2, 7), (4, 6, 2)]

For var y: TR = [1, 2, 7), (5, 6, 2, 7)]

1. All-Defs test paths:

TP = [(1, 2, 7), (1, 2, 3, 4, 6, 2, 7), (1, 2, 3, 5, 6, 2, 7)]

1. All-Uses test requirement:

For var x: TR = [(1, 2, 3), (4, 6, 2, 7)]

* First path covers one use of x
* Second path covers two uses of x (one on edge between nodes 2 and 7, one on node 7)

For var y: TR = [(1, 2, 7)(5, 6, 2, 3, 4)]

* First path covers two uses of y (one on edge between nodes 2 and 7, one on node 7)
* Second path covers three uses of y (one between nodes 2 and 3, one between nodes 3 and 4, one on node 4)

1. All-Uses adequate test paths:

TP = [(1, 2, 3, 4, 6, 2, 7), (1, 2, 7), (1, 2, 3, 5, 6, 2, 7)]

1. All-DU test requirements

For var x:

* These are all the uses for the definition at node 1:

TR = [[(1, 2, 7), (1, 2, 3), (1, 2, 3, 4), (1, 2, 3, 5)]

* These are all the uses for the definition at node 4:

TR = [(4, 6, 2, 7), (4, 6, 2, 3), (4, 6, 2, 3, 5), (4, 6, 2, 3, 4)]

For var y:

* These are all the uses for the definition at node 1:

TR = [[(1, 2, 7), (1, 2, 3), (1, 2, 3, 4), (1, 2, 3, 5)]

* These are all the uses for the definition at node 5:

TR = [(5, 6, 2, 7), (5, 6, 2, 3), (5, 6, 2, 3, 4), (5, 6, 2, 3, 5)]

1. All-DU paths:

For var x:

TP = [(1, 2, 7), (1, 2, 3, 4, 6, 2, 7), (1, 2, 3, 5, 6, 2, 7)]

For var y:

TP = [(1, 2, 3), (1, 2, 3, 5, 6, 2, 3, 4), (1, 2, 7)]