SYSC4101 Lab 5
Lucas Whitaker 101195445

Question 1. (2 pts) What are the test requirements for the All-Nodes criterion? (You are asked to list the test requirements.)

- Visit each node at least once: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

Question 2. (2 pts) What are the test requirements for the All-Edges criterion? (You are asked to list the test requirements.)

- Traverse each edge at least once:
  - (1 → 4), (1 → 5)
  - (2 → 5), (2 → 6)
  - (3 → 6), (3 → 7)
  - (4 → 8)
  - (5 → 8), (5 → 9)
  - (6 → 9), (6 → 10)
  - (7 → 10)

Question 3. (4 pts) What are the test requirements for the Prime-Path criterion? (You are asked to list the test requirements.) Hint: there are 14 of them!

- [1, 4]
- [1, 5]
- [2, 5]
- [2, 6]
- [3, 6]
- [3, 7]
- [4, 8]
- [5, 8]
- [5, 9]
- [6, 9]
- [6, 10]
- [7, 10]
- [5, 9, 6]
- [6, 9, 5]

Question 4. (4 pts) Create a test suite that is adequate for the All-Nodes criterion but is not adequate for the All-Edges criterion. Justify.

Paths: [1 → 5 → 9], [2 → 6], [3 → 7]

Justification:

This test will cover all the nodes, but not all the edges. For example, the edge (1 → 4) does not get covered.

Question 5. (4 pts) Create a test suite that is adequate for the All-Edges criterion but is not adequate for the All-Prime-Paths criterion. Justify.

Paths: [1 → 5 → 8], [2 → 6 → 10], [3 → 7]

Justification:
This suite covers all the edges but not all the prime paths. For example, the prime path [5, 9, 6] does not get covered.

Question 6. (4 pts) Complement your All-Edges adequate test suite to create a test suite that is adequate for the All-PrimePaths criterion. Justify.

Test Suite:
Add paths to cover missing prime paths:

Paths: [1 → 5], [2 → 5], [3 → 6], [4 → 8], [5 → 9], and add path [5 → 9 → 6].

Justification:
Suite now covers all prime paths.

Question 7. (4 pts) What are the round trips in this graph?
No round trips exist as there are no cycles in the graph.

Question 8. (4 pts) Is the All-Prime-Paths adequate test suite you created adequate for the Complete-RoundTrip criterion? For the Simple-RoundTrip criterion? Justify.
The All-Prime-Paths adequate test suite is not adequate for Simple-RoundTrip or Complete-RoundTrip because there are no cycles in the graph to form round trips.

Question 9. (2 pts) What are the test requirements for the All-Edge-Pairs criterion? (You are asked to list the test requirements.)
To cover all pairs of consecutive edges:
(1 → 5) followed by (5 → 8) and (5 → 9)
(2 → 5) followed by (5 → 8) and (5 → 9)
(3 → 6) followed by (6 → 9) and (6 → 10)
(1 → 4) followed by (4 → 8)
(2 → 6) followed by (6 → 9) and (6 → 10)
(3 → 7) followed by (7 → 10)

Question 10. (3 pts) If your All-Edges adequate test suite is not also All-Edge-Pairs adequate, justify why and complement the test suite to create an All-Edge-Pairs adequate test suite.

If the All-Edges test suite is missing some edge pairs, it can be complemented with:

Initial Test Suite for All-Edges:

- Paths: [1 → 5 → 8], [2 → 6 → 10], [3 → 7]

Complementary Paths for All-Edge-Pairs:

- Add paths to ensure all consecutive edges are covered:
- [1 → 5 → 9], [2 → 5], [3 → 6], [6 → 9], [7 → 10]

Justification**:**
This ensures every possible transition between consecutive edges are tested, covering all edge pairs.