

Assignment 3

Due: Friday 11:59pm on Oct 25, 2024

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1. Chapter 6.1, Question 3. [6 marks].

- a. "Location of element in list" fails the disjointedness property. Give an example that illustrates this. [2 marks]

This characteristic fails the disjointness property because if the length of the list is 1, the first element of the list will be the same as the last element of the list. In this case, block 1 and block 2 will have overlap. Example input: ([1], 1)

- b. "Location of element in list" fails the completeness property. Give an example that illustrates this. [2 marks]

It fails the completeness property because these blocks do not cover the possibility where the element does not exist in the list. Example input: ([1, 2], 3)

- c. Supply one or more new partitions that capture the intent of "Location of element in list" but do not suffer from completeness or disjointedness problems. [2 marks]

- Block 1: Element appears in one index of the list
- Block 2: Element appears in multiple indices of the list
- Block 3: Element does not appear in any indices of the list

2. Chapter 6.2, Question 4 [10 marks]

- a. Does the partition "Validity of s1" satisfy the completeness property? If not, give a value for s1 that does not fit in any block. [2 marks]

The partition "Validity of s1" does satisfy the completeness property.

- b. Does the partition "Validity of s1" satisfy the disjointedness property? If not, give a value for s1 that fits in more than one block. [2 marks]

It does indeed satisfy the disjointedness property.

- c. Does the partition "Relation between s1 and s2" satisfy the completeness property? If not, give a pair of values for s1 and s2 that does not fit in any block. [2 marks]

It does not satisfy the completeness property.

Example:

- s1: {1, 2, 3}
- s2: {a, 2, c}

- d. Does the partition "Relation between s1 and s2" satisfy the disjointedness property? If not, give a pair of values for s1 and s2 that fits in more than one block. [2 marks]

It does not satisfy the disjointedness property because if it satisfies "s1 and s2 represent the same set", it also satisfies "s1 is a subset of s2" and "s2 is a subset of s1".

Example:

- s1: {1,2}
- s2: {1,2}

- e. If the "Base Choice" criterion were applied to the two partitions (exactly as written), how many test requirements would result? [2 marks]

There would be 4 test requirements for partition 1 (Validity of s1) and 5 for partition 2 (Relation between s1 and s2).

Note that f: False, t: True

Since each of the blocks can either be true or false.

Partition 1 (Validity of s1):

{f, f, t} Happy path

{t, f, t}

{f, t, t}

{f, f, f}

Partition 2 (Relation between s1 and s2):

{t,t,t,f}

{f,t,t,f}

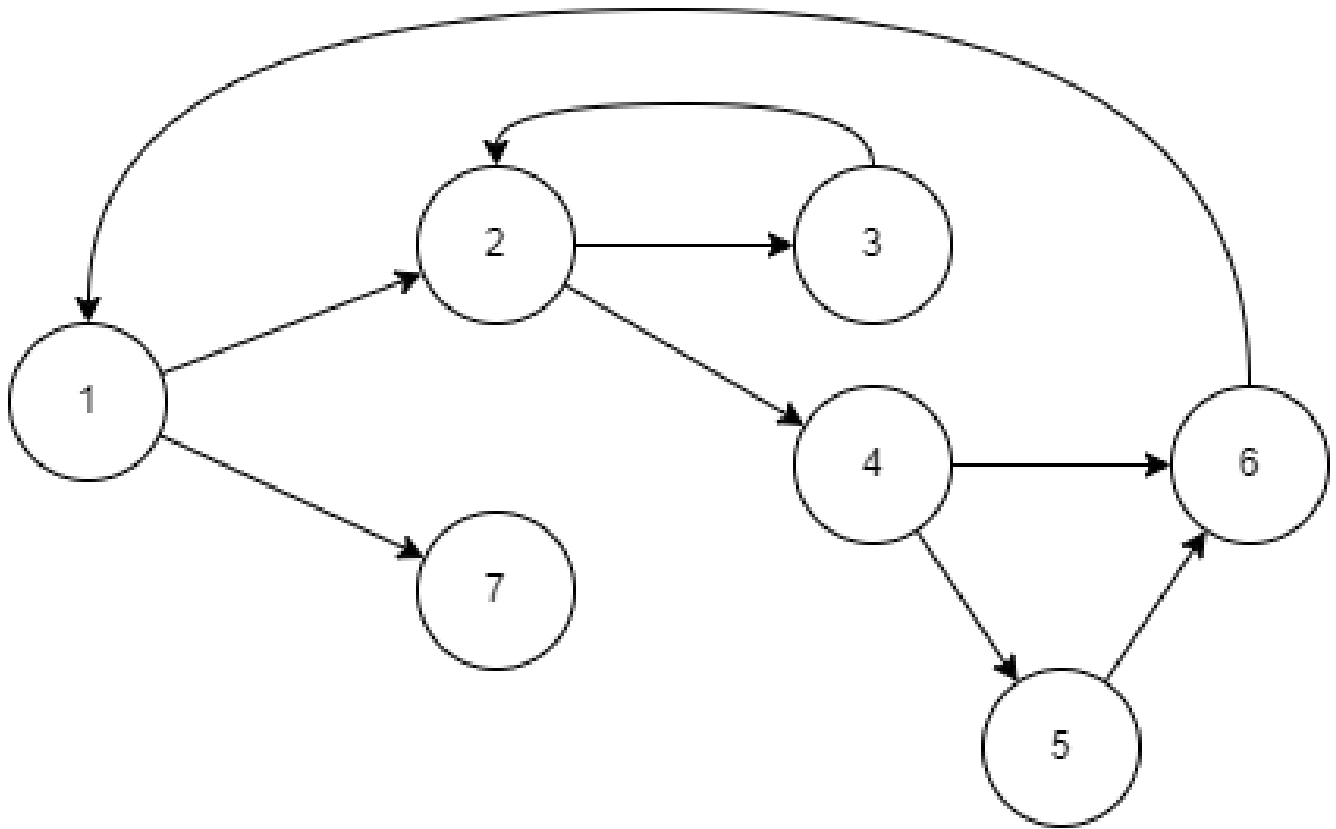
{t,f,t,f}

{t,t,f,f}

{t,t,t,t}

3. Chapter 7.2.2, Question 5. [16 marks]

a. Draw the graph [2 marks]



b. List the test requirements for Edge-Pair Coverage.
(Hint: You should get 12 requirements of length 2.) [2 marks]

(1,2,3)
(1,2,4)
(1,7)
(2,3,2)
(2,4,5)
(2,4,6)
(3,2,4)
(4,5,6)
(4,6,1)
(5,6,1)
(6,1,2)
(6,1,7)

c. Does the given set of test paths satisfy Edge-Pair Coverage? If not, state what is missing. [2 marks]

It does not satisfy Edge-Pair Coverage. (6,1,2) is missing from the given test paths.

d. Consider the simple path [3, 2, 4, 5, 6] and test path [1, 2, 3, 2, 4, 6, 1, 2, 4, 5, 6, 1, 7]. Does the test path tour the simple path directly? With a sidetrip? If so, write down the sidetrip. [2 marks]

It does not tour it directly, but does tour it with the sidetrip [4, 6, 1, 2, 4].

e. List the test requirements for Node Coverage, Edge Coverage, and Prime Path Coverage on the graph. [4 marks]

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),(5,6),(6,1)}

Prime Path Coverage: {[2, 3, 2], [3, 2, 3], [1, 2, 4, 6, 1], [2, 4, 6, 1, 2], [4, 6, 1, 2, 3], [4, 6, 1, 2, 4], [6, 1, 2, 4, 6], [1, 2, 4, 5, 6, 1], [2, 4, 5, 6, 1, 2], [3, 2, 4, 6, 1, 7], [4, 5, 6, 1, 2, 3], [4, 5, 6, 1, 2, 4], [5, 6, 1, 2, 4, 5], [6, 1, 2, 4, 5, 6], [3, 2, 4, 5, 6, 1, 7]}

f. List test paths from the given set that achieve Node Coverage but not Edge Coverage on the graph. [2 marks]

None of the given test sets achieve edge coverage.

P1(missing 3) and P2(missing 5) **do not** achieve node coverage. P3 **does** achieve node coverage, but does not achieve edge coverage.

Therefore, the only test path that achieves node coverage but not edge coverage is P3.

- g. List test paths from the given set that achieve Edge Coverage but not Prime Path Coverage on the graph.
[2 marks]

Since there are no test paths that achieve edge coverage (from question f), there are none that satisfy edge coverage but not prime path coverage.

4. [Bonus] Chapter 7.2.2, Question 8 in the Textbook. [4 bonus marks]

Please see attached zip folder