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Week 3 : Assignment 3

The due date for submitting this assignment has passed.

Due on 2024-08-14, 23:59 IST.

Assignment submitted on 2024-08-13, 18:30 IST

1) State true or false: The control flow graph fragments for loops like while, for etc., can vary slightly and this is acceptable as long as the control flow is captured correctly. ***1 point***

- (●) True.
- ( ) False.

Yes, the answer is correct.
Score: 1

Accepted Answers:
True.

2) A node or a set of nodes that in a particular control flow graph that cannot be reached through DFS or BFS represents which kind of statements in the corresponding program source code? ***1 point***

- ( ) These node(s) represent statements that are incorrect.
- (●) These node(s) represent statements that are not reachable by any input.
- ( ) These node(s) represent statements that are reachable only by inputs that are wrong or out of range.
- ( ) These node(s) represent statements that will not contribute to generating outputs when the program is executed.

Yes, the answer is correct.
Score: 1

Accepted Answers:
These node(s) represent statements that are not reachable by any input.

3) Given a piece of source code, what is the information about the data that is captured in a data flow graph corresponding the code? ***1 point***

- A data flow graph tracks information about how a value of a variable changes.
- A data flow graph captures information about how a variable gets defined, in the sense, the kind of statement that defines a variable.
- A data flow graph captures information about the statements that define a value for a variable and statements that use the defined value of a variable.
- A data flow graph tracks the change of data from the statements where the variables are defined to the statements where the variables are used.

Yes, the answer is correct.
Score: 1
Accepted Answers:
A data flow graph captures information about the statements that define a value for a variable and statements that use the defined value of a variable.

4) Which of the following represents a correct order of subsumption exclusively amongst data flow coverage criteria? In the options below, read $\rightarrow$ as 'subsumes'. ***1 point***

- All-defs coverage $\rightarrow$ All-du-paths coverage $\rightarrow$ All-uses coverage.
- All-defs coverage $\rightarrow$ All-uses-coverage $\rightarrow$ All-du-paths coverage.
- All-du-paths coverage $\rightarrow$ All-defs coverage $\rightarrow$ All-uses-coverage.
- All-du-paths coverage $\rightarrow$ All-uses coverage $\rightarrow$ All-defs-coverage.

No, the answer is incorrect.
Score: 0
Accepted Answers:
All-du-paths coverage $\rightarrow$ All-uses coverage $\rightarrow$ All-defs-coverage.

5) Considering the coverage criteria on both control flow graphs and data flow graphs, which of the following represents a correct order of subsumption amongst the mentioned criteria? Again, read $\rightarrow$ as 'subsumes'. ***1 point***

- Prime paths coverage $\rightarrow$ All-du-paths coverage.
- All-du-paths coverage $\rightarrow$ Prime paths coverage.
- Since one kind of criteria are on control flow only and the other on data flow only, the two cannot be compared.
- None of the control flow coverage criteria subsumes any of the data flow coverage criteria.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Prime paths coverage $\rightarrow$ All-du-paths coverage.

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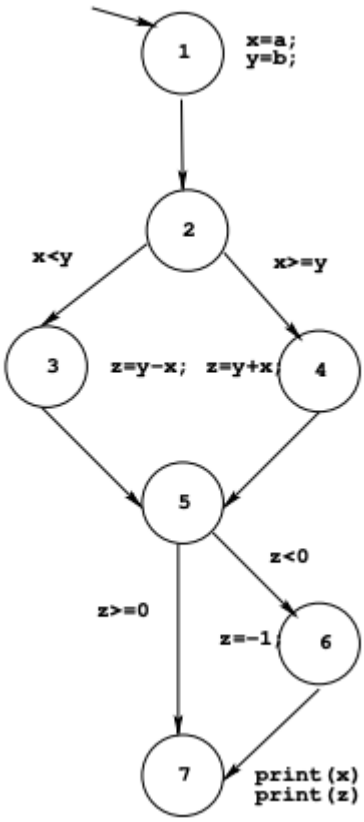
6) List all the nodes where the variable z is defined ***1 point***



- Node 6 only.
- Nodes 3, 4 and 6 only.
- Nodes 3, 4, 5 and 6 only.
- Nodes 2, 3, 4, 5 and 6 only

Yes, the answer is correct.
Score: 1

Accepted Answers:
Nodes 3, 4 and 6 only.

7) Which of the statements below are correct regarding the definitions and uses of the variables x and y? ***1 point***

- The nodes that define the variables x and y are the same.
- The nodes that define and use the variables x and y are the same.
- The nodes and edges that define the variables x and y are the same.
- The nodes and edges that define and use the variables x and y are the same.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The nodes that define the variables x and y are the same.

8) State yes or no: The use of the variables at the edges (2, 3) and (2, 4) are the same as the use of the variables at the nodes 3 and 4. ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1

Accepted Answers:
No.

9) How many du-pairs are there for the variable z? ***1 point***

- Eight du-pairs.
- Nine du-pairs.
- Ten du-pairs.
- Eleven du-pairs.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Nine du-pairs.

10) How many unique du-paths are there for the variable z? ***1 point***

- Four paths.
- Five paths.
- Six paths.
- Seven paths.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Five paths.