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Week 11 : Assignment 11

The due date for submitting this assignment has passed.

Due on 2022-10-12, 23:59 IST.

Assignment submitted on 2022-10-12, 20:50 IST

1) State yes or no: Is concolic testing a white-box testing technique? ***1 point***

- (●) Yes.
- ( ) No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

2) Which of the following is true about concolic testing? ***1 point***

- ( ) Concolic testing is used instead of symbolic testing when the latter fails.
- (●) Concolic testing keeps concrete state and symbolic state.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Concolic testing keeps concrete state and symbolic state.

3) What is the use of a SAT/SMT solver in symbolic testing? ***1 point***

- ( ) SAT/SMT solvers are used to collect path constraints in symbolic testing.
- ( ) SAT/SMT solvers are used to solve path constraints and get values that can be used as test inputs.
- (●) Constraint solvers are not useful in symbolic testing as not all path constraints can be collected and solved.
- ( ) Constraint solvers on predicates always return true or false values which helps to decide the execution paths.

No, the answer is incorrect.
Score: 0

Accepted Answers:
SAT/SMT solvers are used to solve path constraints and get values that can be used as test inputs.

4) State true or false: Symbolic execution can be used to detect non-termination in programs. ***1 point***

- (●) True.
- ( ) False.

No, the answer is incorrect.
Score: 0

Accepted Answers:
False.

5) Which of the following is a list of techniques used in the algorithm deployed by DART? ***1 point***

- ( ) Ramdom testing, symbolic testing and constraint solvers.
- ( ) Symbolic testing and automated testing.
- (●) Directed search, random testing and constraint solvers.
- ( ) Concrete testing and symbolic testing.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Directed search, random testing and constraint solvers.

6) Which of the following strategy is used for input search in concolic testing? ***1 point***

- ( ) Random search.
- (●) Systematic, random search interleaved with path-sensitive search.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Systematic, random search interleaved with path-sensitive search.

Common data for Q7-Q10:

Consider the code fragment given below. Answer the following questions related to symbolic execution of the given code fragment.

```
0: int x, y;
1: if (x > y) {
2:     x = x + y;
3:     y = x - y;
4:     x = x - y;
5:     if (x - y > 0)
6:       --- error ---;
   }
```

7) What does the code fragment do? ***1 point***

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- It checks if x is greater than y.
- It checks if y is greater than x.
- It swaps the values of x and y.
- It swaps the values of x and y twice.

Yes, the answer is correct.
Score: 1

Accepted Answers:
It swaps the values of x and y.

8) How many decision points and execution paths are there in the code fragment? ***1 point***

- Two decision points and three execution paths.
- Three decision points and four execution paths.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Two decision points and three execution paths.

9) What will be the path constraint at line 1 of the code fragment such that program exits without further execution? ***1 point***

- x > y.
- x <= y.

Yes, the answer is correct.
Score: 1

Accepted Answers:
x <= y.

10) State yes or no: Is the error statement reachable in the given program fragment? ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1

Accepted Answers:
No.