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kumawatbhupendra90@gmail.com ˅

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Course outline

Week 9 : Assignment 9

The due date for submitting this assignment has passed.

Due on 2024-09-25, 23:59 IST.

Assignment submitted on 2024-09-24, 17:26 IST

1) Which of the following statements are true about mutation testing applied at the various stages of the software development life-cycle? **1 point**

○ Mutation can be applied to programs, input strings and to design artifacts. In all the cases, test cases are written to kill the mutants.

○ Mutation can be only applied to programs and test cases can be written to kill the mutants.

◉ Mutation can be applied to programs, inputs and to design artifacts. Test cases can be written to kill the mutants for programs and design artifacts, not for input mutations.

○ Mutation can be applied only to individual methods, not for inputs and design artifacts. Test cases can be written to kill the mutants.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Mutation can be applied to programs, inputs and to design artifacts. Test cases can be written to kill the mutants for programs and design artifacts, not for input mutations.

2) State yes or no: Are there mutation operators available for inputs that are XML files that are used in web applications? **1 point**

○ Yes.

◉ No.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Yes.

3) Consider a method A calling another method B, with the callee method B returning   **1 point**
an integer back to method A. In a particular mutation, the method call for B is deleted and
instead of the return statement, an integer constant is added in the same statement in method A.
Which type of mutation will this be?

○ Integration method replacement.

◉ Integration method call deletion.

○ Integration method return value change.

○ Integration callee method change.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Integration method call deletion.

4) Suppose the access level for a method M in a particular class C is changed and this **1 point**
change denies access to the method M for one of the child classes of C. Which mutation
operator has been applied here and has the resulting mutant been successfully killed?

○ Overriding method change operator has been applied and the resulting mutant has been
killed.

○ Overriding method deletion operator has been applied and the resulting mutant has been
killed.

○ Method access has been changed and it need not mean that the resulting mutant has
been successfully killed.

◉ Access modifier change mutation operator has been applied and the resulting mutant has
been successfully killed.

Yes, the answer is correct.
Score: 1

Accepted Answers:
*Access modifier change mutation operator has been applied and the resulting mutant has
been successfully killed.*

5) Is method overloading different from method overriding and if yes, what is the main **1 point**
difference?

○ Method overloading and method overriding are the same.

◉ Method overloading is different from method overriding. In the former case, the two
methods are in the same class and in the latter case, the method is present in a class and
one of its descendants.

○ Method overloading is different from method overriding. In the former case, the method is
present in a class and one of its descendants, and in the latter case, the two methods are in
the same class.

○ Method overloading and method overriding are nearly the same where two different
pieces of code are given to the same method.

Yes, the answer is correct.

Score: 1
Accepted Answers:
*Method overloading is different from method overriding. In the former case, the two methods
are in the same class and in the latter case, the method is present in a class and one of its
descendants.*

6) When a particular variable belonging to a class is such that there is only one copy of **1 point**
the variable for the entire class, what is the associated declaration of the variable called?

- ◉ Static.
- ○ Private.
- ○ Instance.
- ○ Protected.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Static.

7) How we say that mutation testing subsumes node and edge graph coverage criteria **1 point**
despite the fact that these are two different testing techniques?

- ○ Mutation testing does not subsume node and edge coverage criteria.
- ○ Mutation testing is a weaker testing technique than node and edge coverage criteria.
- ○ We consider weak mutation and specific mutation operators for the given subsumption.
- ◉ We consider strong mutation and specific mutation operators for the given subsumption.

No, the answer is incorrect.
Score: 0

Accepted Answers:
We consider weak mutation and specific mutation operators for the given subsumption.

Consider the code snippet below and answer the following two questions below.

```
public class Main {
int x;

// Constructor with a parameter
public Main(int x) {
  this.x = x;
}

// Call the constructor
public static void main(String[] args) {
  Main myObj = new Main(5);
  System.out.println("Value of x = " + myObj.x);
}
}
```

8) What is the use of the this keyword above?   **1 point**

- ◉ It refers to the current object in the constructor.
- ○ It invokes the current class method.

○ It is used to pass an argument whose value is not clear.

○ It is a method parameter

Yes, the answer is correct.
Score: 1

Accepted Answers:
It refers to the current object in the constructor.

9) What will the output of the above code snippet be if the this keyword is omitted?   **1 point**

○ Output will be unknown.

○ Output will be 0.

◉ Output will be 5.

○ There will be no output.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Output will be 0.

10) Will the mutant that is created by a mutation that deletes the this keyword be killed   **1 point**
by any test case? State yes or no.

◉ Yes.

○ No.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Yes.