Overview of Software Engineering

Example Questions for the Second In Class Test

The in class test on Monday 22 April, 2024, will test material from the following **three** lectures:

Week 7 HCI evaluation part one

Week 8 HCI evaluation part two

Week 9 Software quality and testing

Example questions

1. Given the code below, which option(s) provide the minimum set of test cases for the full statement coverage?

```
public void calculateSum(int a, int b) {
    int sum = a + b;
    if(sum > 10) {
        System.out.println("Sum is greater than 10");
    }
    else {
        System.out.println("Sum is less than or equal to 10");
    }
}
```

a.

Test Case 1: a=5, b=4
Test Case 2: a=7, b=2

b.

Test Case 1: a=3, b=3
Test Case 2: a=4, b=1

c.

Test Case 1: a=7, b=4
Test Case 2: a=5, b=3

d.

Test Case 1: a=11, b=0
Test Case 2: a=6, b=6

Explanation:
To achieve full statement coverage for the calculateSum method, we need to ensure that every line of code in the method is executed at least once during testing.

Option C is correct because,
Test Case 1: a=7, b=4
- This test case ensures that the sum variable is calculated correctly as 11, which satisfies the condition in the if statement, resulting in the message "Sum is greater than 10" being printed.

Test Case 2: a=5, b=3
- This test case ensures that the sum variable is calculated correctly as 8, which does not satisfy the condition in the if statement, resulting in the message "Sum is less than or equal to 10" being printed.

Therefore, to achieve full statement coverage for the calculateSum method, we need to execute the above two test cases.

Options A and B are incorrect because they have two test cases which both execute only the statements of the else branch, as in both cases the sum is less than 10.

Option D is incorrect because it has two test cases with both execute only the if statements of the if branch, as in both cases the sum is over 10.

2. Which of the following statements is/are true about calculating Cyclomatic Complexity?

a. Cyclomatic Complexity measures the number of independent paths through a program

b. Cyclomatic Complexity is calculated as the number of statements plus two

c. Cyclomatic Complexity is calculated as the number of lines of code in a program

d. Cyclomatic Complexity is only relevant for object-oriented programs

Correct answer: a

3. Many software IDEs provide autocompletion functionality.

Which of Nielsen’s usability heuristics is being implemented by this feature?

a. Visibility of system status
b. Error prevention
c. Recognition rather than recall
d. Help and documentation
e. Match between the system and the real world

Correct answer: c

4. Which of the following are advantages of using questionnaires?

a. They are not expensive to administer

b. They can be administered digitally at scale
c. They are easy to develop
d. They can be used to ask a large number of questions in a short time
e. They enable the measurement of subjective opinions

Correct answers: a, b, e