

# Fundamentals of Software Testing\*

(A.Y. 2022/2023) – Duration: 1h30m

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## Exercise 1.

Our company has been asked to develop a very simple components that should enable asynchronous communications among two systems A and B. In particular the developed component should permit to system A to store an information on our component that can be successively fetched by system B. Anyway after two consecutive store actions by system A our component should alert A that it is not possible to store the information until system B makes a fetch. On the other hand, in case system B tries to fetch an information while component A did not store any unread information, our component should notify B with an error message. You are asked by the PM to deeply test the behaviour of the component.

Select the most suitable test case derivation strategy and provide a specification for the test case composing the test suite.

16 points

## Exercise 2.

Consider the following program:

```
1  enum Discount {nodisc, normal, high}
2  enum Course {antipasto, primo, secondo}
3
4  public double computeBill(Course[] order, Discount disc) {
5      int i = 0;
6      double total = 0.0;
7      double discount = 0.0;
8      while (i < order.length) {
9          if (order[i] == Course.antipasto) total = total + 10;
10         if (order[i] == Course.primo) total = total + 15;
11         if (order[i] == Course.secondo) total = total + 30;
12         i = i + 1;
13     }
14     if (disc == Discount.high) discount = 0.15;
15     else if (disc == Discount.normal) discount = 0.05;
16     total = total * (1 - discount);
17     return total;
18 }
19
```

- Provide a minimal test suite that fully satisfy the condition/decision coverage adequacy criterion.
- Derive a data-flow graph for the program above and discuss if the test suite derived at the previous step satisfies any data-flow adequacy criteria.<sup>1</sup>
- Compute the c-use coverage for the test suite derived at the previous step and in case it is not equal to 1 discuss why and how a test suite satisfying the c-use criterion can be derived..

16 points

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\*For the QAIS module you should solve Exercises 1

<sup>1</sup>Use line numbers to define the blocks in the data flow