

# Software Engineering II

## (A.Y. 2014/2015)\*

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### Ex. 1 - 5pts

Consider the BOR, BRO, BRE criteria for testing predicates including expressions and relational operator, and shortly introduce their objectives and differences. Use the most appropriate criteria to generate a test set, able to discover logical and relational fault, for the following compound predicate:

$$((a \cdot c) \geq (b + c) \vee q) \wedge ((c = d) \vee q) \quad (1)$$

### Ex. 2 - 5pts

Consider the development of a buffering system that has three positions and that has to abide by the following specification:

- In the initial state (state 1) the buffer is empty and it can accept the message `write` generating in output the message `ok` and then it moves to state 2. Instead in case the message received is `read` the buffering systems replies with a `nok` message and it stays in state 1.
- In state 2 and 3 the system behave similarly and in case it receives a `write` it replies with an `ok` message moving to state 3 and 4 respectively. In case the system receives a `read` message it replies with an `ok` message and it moves back to state 1 and 2 respectively.

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\***Note:** students that would like to use the mark already got in the Project Management Course can decide to skip one of the proposed exercise. Please indicate that you are skipping the exercise for such a reason.

- In the final state (state 4) the buffer is full, so in case it receives a `write` message it replies with a `nok` message and it stays in state 4. Instead in case it receives the message `read` it replies with an `ok` message and it moves to state 3.

After having modeled the system using a Finite State Machine generate a test set according to the  $\mathcal{W}$ -method strategy assuming an implementation with one additional state<sup>1</sup>

### Ex. 3 - 5pts

Consider a system that needs to be tested according to possible configurations given by the combination of 6 different factors each one constituted by the following levels:

- $A = \{a_1, a_2, a_3, a_4\}$
- $B = \{b_1, b_2, b_3, \}$
- $C = \{c_1, c_2, c_3, c_4\}$
- $D = \{d_1, d_2, d_3, d_4\}$
- $E = \{e_1, e_2, e_3, \}$
- $F = \{f_1, f_2, f_3, \}$

Derive a test set according to the pairwise design using the most suitable approach among the ones presented in the course<sup>2</sup>. In the generation consider that there are some constraints that have to be respected:

- factors D, E, F are strongly interrelated factors and among all the possible configurations that are theoretically possible only the following 3 should be considered as real  $(b_1, e_1, f_2)$ ,  $(b_2, e_2, f_1)$ ,  $(b_3, e_3, f_2)$ .
- for factors A and B the levels  $a_4$  and  $b_3$  cannot be assumed together

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<sup>1</sup>For convenience it is possible to abbreviate the input and output alphabet in the representation of the machine with `write=w`, `read=r`, `ok=o`, `nok=n`

<sup>2</sup>use the book to retrieve the data structureS you need to fulfill the requests of this exercise