9. Exercises

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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:

$$a \geq b \wedge \neg(c > d) \vee p \tag{1}$$

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$$((a \cdot c) \geq (b + c) \vee q) \wedge ((c = d) \vee q) \tag{2}$$

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Consider the development of a communication system that has to abide by the following specification (protocol):

- In the initial state it waits for two different messages `msg1` and `msg2` and then it behaves accordingly to the following rules:
  - In case `msg1` is received the system output message `ack` and it moves to state 2
  - In case `msg2` is received the system output message `ack` and it moves to state 3
- in state 2 if the system receives message `msg1` it outputs message `error` and it moves to state 4 while if it receives message `msg2` it outputs message `ack` and it moves to state 3
- in state 3 if the system receives message `msg2` it outputs message `error` and it moves to state 5 while if it receives message `msg1` it outputs message `ack` and it moves to state 2
- in state 4 if the system receives message `msg1` it outputs the message `ack` and it stays in the same state. At receiving `msg2` the system outputs message `ack` and it moves back to state 2.
- in state 4 if the system receives message `msg2` it outputs the message `ack` and it stays in the same state. At receiving `msg1` the system outputs message `ack` and it moves back 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

Consider a system that needs to be tested according to the following possible configuration parameter:

- Operating System: Linux, Windows
- Browser: Chrome, Edge
- DBMS: MySQL, PostgreSQL
- Web Server: IIS, Apache
- Business Logic Container: ISAPI, Tomcat

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

- It is not possible to generate a configuration of a system using the OS Linux and the Web Server IIS
- The container ISAPI can be used only with the web server IIS and equally the Tomcat container can be used only with the Apache Web Server
- The Apache, Postgres combination is not available on a Windows machine for which the connector is not available