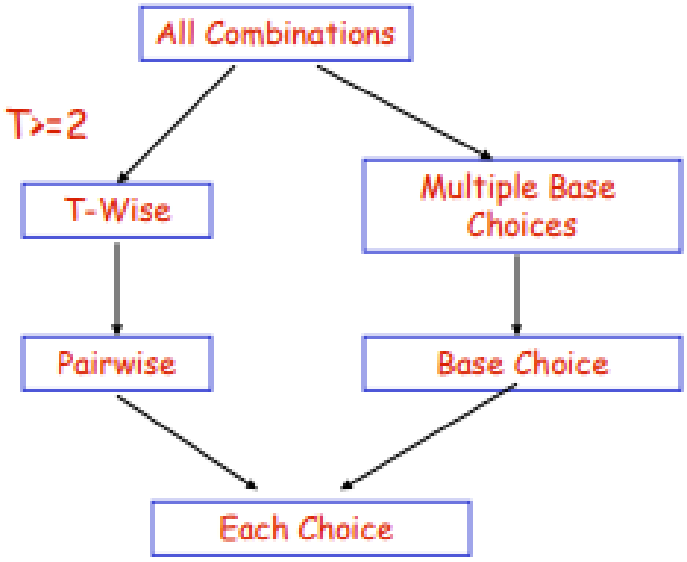
SOFT3416 Software Validation and Verification
Spring 2024
HW #4 (50 points), In groups of maximum two students
Due Date: May 29, 2024 13:00

IŞIK UNIVERSITY
COMPUTER SCIENCE AND ENGINEERING

1. Prove with an example code snippet and a test scenario that there is no subsumption relationship with "Pairwise Testing" and "Base Choice Testing", as indicated by the following figure. First describe your approach to prove the above given statement, and support your proof with at least one concrete example.



2. Suppose that while mocking a dependency a fault is introduced to the system under test, i.e., the tester made a mistake while mocking the dependency, and the mocked unit now includes a difference from the original unit being mocked. Is it possible to achieve the following situations during testing?

a. A false positive outcome, i.e., a test case now passes even though the function being tested contains a bug that would fail the test case, had the dependency been mocked properly. If so, provide an example (you can reuse the *SimpleDate.rangesOK()* example, together with the relevant dependency mocking, manual or automatic, to illustrate your point). If not, provide a reasonable explanation.
b. A false negative outcome, i.e., a test case fails even though the function being tested does **not** really contain a bug that would make the test case fail, had the dependency been mocked properly. If so, provide an example (you can reuse the

SimpleDate.rangesOK() example, together with the relevant dependency mocking, manual or automatic to illustrate your point). If not, provide a reasonable explanation.

If you answered positively to any of the questions above, you are required to provide an example to support your argument. In your examples, you are required to illustrate your point by properly modifying the function under test (*SimpleDate.rangesOK*) so as to introduce a bug if required, your test cases, and the mocking steps. Assuming that you answered "yes" to any or both of the questions given above, you should clearly indicate, for example, how the test case that would normally fail due to a present bug, now passes because of improper mocking (i.e., false positive); or how the test case that would normally pass since there is no corresponding bug in the function implementation now fails because of improper mocking (i.e., false negative). All your codes (modified function under test, test cases together with proper mocks, etc.) and the results of your test runs should be included within your answers.

Homework Submissions:

Please submit your deliverable for the assignment as a single "*.pdf*" file via the Blackboard system, under the following file naming scheme:

<team_member1_name_last_name_number_team_member_name_last_name2_soft3416_hw4.pdf>

Late Acceptance Policy: Late submissions after the deadline will not be accepted.

Good luck.