A Family of Testing Path Selecting Criteria

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Abstract

Software testing is an important process in software quality assurance. A number of testing methodologies have been proposed. Two famous testing criteria are: all-paths and all-statements. The all-paths criterion be satisfied if the testing paths includes every complete path in a program graph, and the testing paths includes every statement of the program (i.e. every node of the program graph), the all-statements criterion (or *all-nodes criterion*) be satisfied. All of the other criterion can be catagorized between all-paths criterion and all-statements criterion [17]. There is a trade off in selecting testing criteria. The stronger the selected criterion, the more complicate test cases must be used, and the correctness of software will be enhanced. On the other hand, the weaker the selected criterion, the lower assurance of software correctness. It depends on the size of program, budget, and time constraint to decide which criterion should be used for conducting testing. Since there still gaps among existing testing criteria. In order to provide more choices of testing criteria selection, a family of testing methodologies is proposed. They are *all-DRTP criterion, all-PRTP criterion* and *BADP criterion*. Comparison of the proposed methodologies with other methodologies is also illustrated. The results show that it could be an another good indicator for selecting testing path.

Keywords: Static Testing, Dynamic Testing, Def-clear Path, Data Dependency, Variable Definition.