Abstract

Software testing assesses the functionality and correctness of the software through analysis and execution. It is done by exercising appropriate number of test cases so that no part of the program is left untested. Presence of multiple loops in a program makes it unlikely or impossible to test all paths. Therefore researchers try to find the subsets of the test cases, which when tested give confidence of complete testing. However, the subsets of paths are based on some testing criteria. In this research paper GA approach has been used to find out the subset of paths of the test program that fulfills all edge coverage criteria. The Genetic Algorithm for Test Case Generation (GATCG) proposed in this work generates reduced number of paths for a test program. These paths are termed as prime paths. The proposed GATCG technique makes use of the concept of prime paths to reduce the cost of testing. The efficiency of proposed algorithm is established from the results, in terms of number of iterations and time consumed in generating the prime paths for test programs.

**Index Terms**

Computer Science  
Software Engineering

**Keywords**

Prime paths, Test case generation, Testing cost, Genetic algorithm.
Empirical Validation of Test Case Generation based on All-edge Coverage Criteria