Automated Test Cases Generation from Requirements Specification

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Abstract

Abstract— Program testing is an essential phase in the program development life cycle as it ensures the quality of the program. Additionally, its value in identifying mistakes and gaps in the early stages of software development. Manual testing, which involves the generation of test cases by a human, is one of the most popular methods of generating test cases. As a result, optimizing program testing by automating the test case generation process can result in time and cost savings as well as improved end-product quality. To save time, effort, and money, and to obtain accurate results. Specification documents may be writing in formal type use natural language, they require expert knowledge and reprocessing for writing and understanding them to generate test cases with more details and clarify. However, there are few research works on the aspect of generating test cases from requirements specification especially generate test cases from use case description. An Approach to Generate Test Cases from Requirements specification is proposed in this study that consists of several processes. Use case description model is used as a basis for the approach. The proposed approach has three algorithms that are shown as following: 1- Automatically generate control flow graph and natural language table. 2-Automatically convert control flow graph and natural language table into test paths. 3- Automatically generate the test cases. To explain the proposed approach that generates test cases from the use case description model stage by stage, three case studies are used in this study. Various coverage criteria are considered to validate and evaluate the proposed approach. The primary results show that the generated test cases achieve high coverage. This automatic test case generation approach shows effective and efficient results.

Keywords: Software Testing, Test Case Generation, natural language, Use Case Description.