Abstract

**A study of Techniques for Software Test Data Generation**

**Ankita Bihani (10BCE0179) Sargam Badyal (10BCE0385) Pooja Waikar (10BCE0430) Research guide: Prof Senthil J. VIT UNIVERSITY 3/12/2013**

**A study of Techniques for Software Test Data Generation**

**Introduction:**

Software testing is the process of evaluating the capability or any functionality of the system and comparing it with its desired performance. Testing is not a simple debugging process. It spans across a wide array of activities that include quality assurance, verification, validation and estimation of its reliability, scalability and maintainability. Software testing is a trade-off between budget, time and quality.

**Problem Statement:**

 In the current scenario, as the complexity of the software being developed is increasing, software testing is becoming more and more challenging. In cases where no proper software testing is involved, a huge amount of money is spent to compensate the errors occurring. Effective development of a project requires choosing the most appropriate testing techniques suiting the project requirements. Application of genetic algorithms for software testing seems to be a solution but suffers from major drawbacks like it has too many test cases, is an extremely lengthy process and is expensive. Software testing process can become much easier if the right combination of the various testing techniques is employed. A good test case is a test case whose chances of finding a bug are more. The challenge is to simplify the process of software test data generation and make it more efficient.

**Solution:**

This paper aims to find the most effective combinations of the various software testing techniques that can be employed. Finally, a ratio of each testing to be employed in every phase of software design and development will be derived.

A ***Hamiltonian circuit*** is a closed path in an undirected graph G that visits each vertex exactly once. Thus, it ensures that all the requirements of the system are visited (met) exactly once. Hence, the concept of Hamiltonian circuit can be used to test that the requirements of the system and its performance match correctly. In addition to the system requirements, compatibility with all platforms can become one of the nodes of the graph. Thus, the software tester does not miss out on testing any important functionality of the system.

Functional testing (Specification based) and Structural Testing (Code based) are the two types of automated test data generation techniques. The right mix of the two and at the right phase is the solution proposed.

**References:**