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Team 7

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Test case selection

Testing is the most important component of any process in software engineering to be able to produce applications that are of high quality since it aims to find errors in the tested object and gives confidence of its correct behavior by executing the tested object with input values.

The test case selection is a particular action which is assigned to the test engineers, this must be executed during the test cases. In this context, the test case selection aims to eliminate redundant or unnecessary test data, which is crucial for the definition of test strategies.

If the application does not work properly, this situation is usually called "Regression".

Time and resource constraints are things to consider for the industry with regards to software testing, as optimizing testing is essential in development. Although there are many testing techniques, there are currently no scientific guidelines for the selection of appropriate techniques in different domains and contexts.

Although the question of "which are the most appropriate techniques to develop the bank of test cases to test a given System" apparently poses enormous difficulties, this is nevertheless a question that testers grapple with every time they have to test a system. . And how is this question currently being answered?

Neither systematically nor with well-defined guidelines. Indeed, of all the existing techniques, some are never considered to be used and others are used over and over again in different projects without even being examined after their use whether or not they are really useful.

Methods for test case selection could be classified into 3 divisions:

1. **Coverage Method**

This method works based on the coverage. It includes coverable elements used in the updated segment of the software program.

2. Minimization Method

This method works similar to the method mentioned above, but it works based on selecting the smallest number of cases

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3. Safe Method

This technique is quite different from the coverage method mentioned earlier. It makes a selection of cases that influences an updated program to generate a mixed result aside from the actual program.

One problem of testing software is selecting the suitable test cases from the test suit regarding the size of the programs. If the size of selected test cases is big, then it can affect the whole performance of software development life cycle. Accordingly, it increases testing time and produces many bugs.

Guidelines for Selecting Test Cases for Regression Testing

Inclusivity:

Examines the level to which a test case would influence the updated program to generate a specific result in the actual program. It allows you to detect defects when introducing a new update.

Precision:

In the event that the test cases do not generate specific results that the real one will not be selected.

Effectiveness:

Review the financial budget of the entity and the possibility to use another method.

Generality:

This verifies the test case's ability to handle multiple languages, including complicated and pre-programmed changes within the network.

The concept of selecting the test cases:

1. Dataset

The seven subject programs developed by the Siemen Suite.

TABLE I. THE SUBJECT PROGRAMS

Name	*F*	*L*	*V*
replace	21	516	32
print_token	18	402	7
print_token2	19	483	10
schedule2	16	297	10
schedule	18	299	9
totinfo	7	346	23
tcas	9	138	41

Definitions;
F: is the numbers of function.
L: is the lines of code.
V: is the numbers of version.

2. Traditional Methods

This technique tests all test cases in a test suite before writing the new code by considering functions that required by both users and developers. It suits for the smallest size with low complexities under certain changes. However, it is not appropriate technique, where numbers of function and code are large.

3. Steps general to perform software test cases

Most for the development of test cases have some parts that must always be present in the analysis. However, each test case can be divided into 8 basic steps.

Step 1: Test Case ID

Test cases must carry unique IDs. In most cases, following a pattern for this ID helps with organization, clarity, and understanding.

Step 2: Description of the test

It must be described in detail

the function being tested or what is being verified.

Step 3: Assumptions and Preconditions

This implies that all the data that enter are validated.

Step 4: Data testing

It is the verification that all the variables and their values in the test case are correct when storing information.

Step 5: Steps to execute

The program is run from the perspective of an end user, verifying that it is easy to understand.

Step 6: Expected Result

This indicates the expected result after the tests performed, with a successful program execution.

Step 7: Actual result and post-conditions

Compared with the result shown in the previous step, we can determine the result of the test case.

Step 8: Pass / Fail

The determination of pass / fail status depends on how the expected result and the actual result compare with each other.

4. Description of the Proposed Model

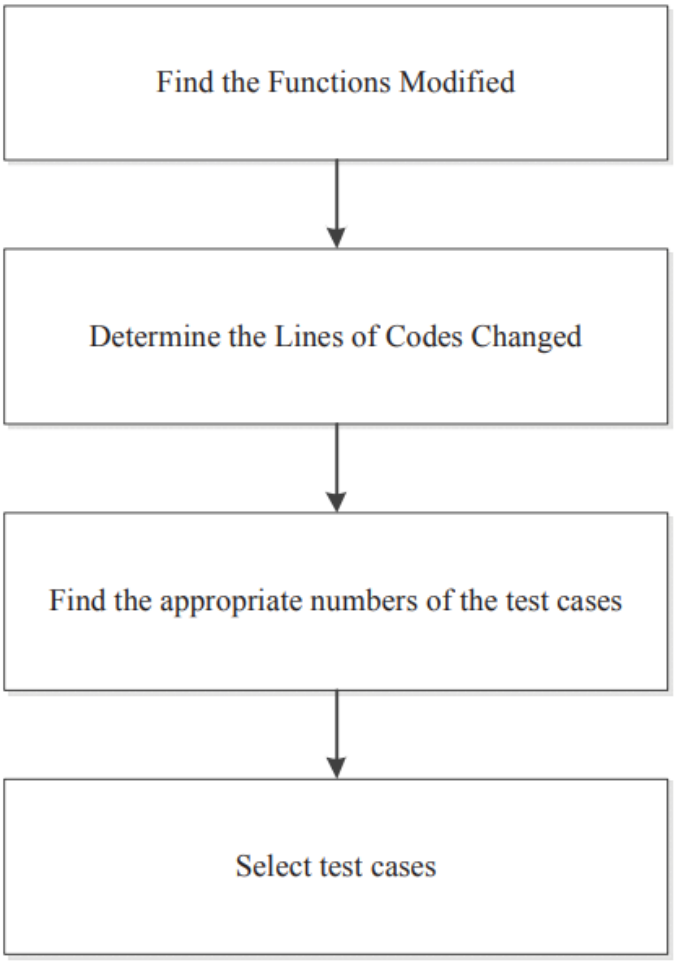
Software testing improvement (STI) is proposed, particularly in the process of developing and modifying the new software version from the previous program. It is developed by considering the changes of the requirements and modified programs.

5. Concepts of the Model

The user requirement of each software can influence the value of function. The average x-value will be determined by using all of the old software versions.

6. Algorithm of the Proposed Model

The algorithm of STI gives four main steps.



Step 1: Find the Functions Modified
Each program, there are many times of modifying the software.

Step 2: Determine the Lines of Codes Changed
The code comprised with many lines of the instruction. The code becomes complexity, when the environment changes affect the whole software.

Step 3: Find the appropriate numbers of the test cases
The numbers of test cases are chosen for testing as the new software.

Step 4: Selection of test cases
Are identified with respect to the related persons.
Each test case the level of acceptance will be evaluated

Questions about the topic:

1.- What is the objective of test case selection?

- Eliminate redundant or unnecessary test data.
- Review the financial budget of the entity and the possibility to use another method.
- Verifies the test case's ability to handle multiple languages
- Examines the level to which a test case would influence the updated program to generate a specific result in the actual program.

2.- What problems does a company have when testing software?

- Time and resources.
- Personal
- The unknown

3.- Name step 3 of the ITS algorithm.

- Find the Functions Modified.
- Selection of test cases
- Find the appropriate numbers of the test cases

4.- Select a guideline to select test cases for regression testing

- Data testing
- Effectiveness
- Pass / Fail
- Coverage Method

5.-The acronym FLV defines:

- **F** is the numbers of function.
  L is the lines of code.
  V is the numbers of version.

- **F** is the numbers of factors
  L is the lenguague.
  V is the valor.

- **F** is the numbers of finds.
  L is the limit.
  V is the numbers of variable.

6.- What is the purpose of software testing improvement (STI)?

- Increasing the ability of test case selection regarding to the concept of regression test selection
- Decrease test case selection capability with respect to regression test selection concept.
- Remove test case selection capability with respect to the concept of regression test selection.

7.- How many general steps are there for a software test?

- Eight
- Nine
- Four
- One

8.- What is the goal of inclusivity?

- Review the financial budget of the entity and the possibility to use another method.
- Verifies the test case's ability to handle multiple languages, including complicated and pre-programmed changes within the network.
- Includes coverable elements used in the updated segment of the software program.
- Examines the level to which a test case would influence the updated program to generate a specific result in the actual program.

9.- Who is focused on conducting software testing?

- Test engineers
- Software engineers
- The end user

10.- In how many methods or divisions could the selection of test cases be classified?

- **8-10**
- **3**
- **5**
- **7**

Bibliography

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