### TESTING

Software testing is an empirical investigation conducted to provide stakeholders with information about the quality of product or service under test with respect to the context in which it is intended to operate. Software Testing also provides an objective, independent view of the software to allow the business to appreciate and understand the risk at implemented of the software. Test techniques include, but are not limited to, the process of executing a program or application with the intent of finding software bugs.

It can also be stated as the process of validating and verifying that a software program/application/product meets the business and technical requirements that guided it’s design and development, so that it works as expected and can be implemented with the same characteristics. Software testing , depending on the testing method employed , can be implemented at any time in the development process, however the most test effort is employed after the requirements have been defined and coding process has been completed.

### TESTING METHODS

Software testing methods are divided into black box testing and white box testing. These two approaches are used to describe the point of view that a test engineer takes when designing test cases.

#### Black box testing :

Black box testing treats the software as a “black box”, without any knowledge of internal implementation. Black box testing methods include: equivalence partitioning, boundary value analysis, all-pair testing, fuzz testing, model-bases testing, traceability matrix, exploratory testing and specification-based testing.

#### Specification based testing :

Specification based testing aims to test the functionalities of a software according to the applicable requirements. Thus, the tester inputs data into, and only sees the output from, the test object. This level of testing usually requires through test cases to be provided to the tester, who then can simplify verify that for a given input, the output value, either ‘is’ or ‘is not’ the same as the expected value specified in the test case. This type of testing is necessary but not sufficient to guard against certain risks.

#### Advantages and disadvantages :

The black box testers has no bonds with the code, and a tester’s perception is very simple: a code must have bugs. Using this principle, “Ask and you shall receive” black box testers find bugs where programmers don’t. But, on the other hand, black box testing has been said to be “like a walk in a dark labyrinth without a flashlight” because the tester doesn’t know how the software being tested was actually constructed.

That’s why there are situations when a black box tester writes many tests cases to check something that can be tested by only one test case, and/or some parts of the back end not tested at all. Therefore black box testing has the advantage of “an unaffiliated opinion”on the one hand, and the disadvantage of “blind exploring” on the other.

#### White box testing :

White box testing by contrast to black box testing, is when the tester has access to the internal data structures and algorithms.

*Types of white box testings:*

The following types of white box testing exits:

* API testing - Testing of the application using Public and private APIs.
* Code coverage - Creating tests to satisfy some criteria of code coverage.

For example, the test designer can create tests to cause all statements in the program to be executed at least once.

* Fault injection methods.
* Mutation testing methods.
* Static testing - White box testing includes all static testing.

### CODE COMPLETION EVALUATION

White box testing methods can also be used to evaluate the completeness of a test suite that was created with black box testing methods. This allows the software team to examine parts of a system that are rarely tested and ensures that the most important function points have been tested.

#### *Two common forms of code coverage are :*

* Function coverage: which reports on functions executed and
* Statement coverage: which reports on the number of lines executed to complete the test.

They both return coverage metric, measured as a percentage.

### HARDWARE AND SOFTWARE REQUIREMENTS

1. Operating system : Windows 7 and above
2. Processor : Pentium(any) or core i3 or above
3. Ram : 512 MB+
4. Hard disk : SATA 40 GB or above
5. CD/DVD : If back-up required
6. Monitor 15-17 inch
7. Key board and mouse
8. Printer : If print is required

### SOFTWARE REQUIREMENTS

* Windows OS
* Python
* MySQL connector module
* Tkinter module
* Datetime module

### BIBLIOGRAPHY

#### Computer science with Python - Class XII by Sumita Arora

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