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Software Testing Part-2

Software Testing part 2 :

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Control Structure Testing :It is used to increase the security by testing some structures present in the program.

Different Types of Testing are as follows:

Condition

It is a test cased design method, which ensures that the logical condition and decision statements are free from errors. The errors present in logical conditions can be incorrect boolean operators, arithmetic expressions, and so on.

Data flow Testing:

The method chooses the test path of a program based on the locations of the definitions and uses all the variables in the program.

Loop Testing :

It is actually a white box testing technique. It focuses on the validity of loop construction.

Deriving Test Cases: A test case in is a group of conditions or variables under which a tester will determine whether an application or software system is working correctly or not.

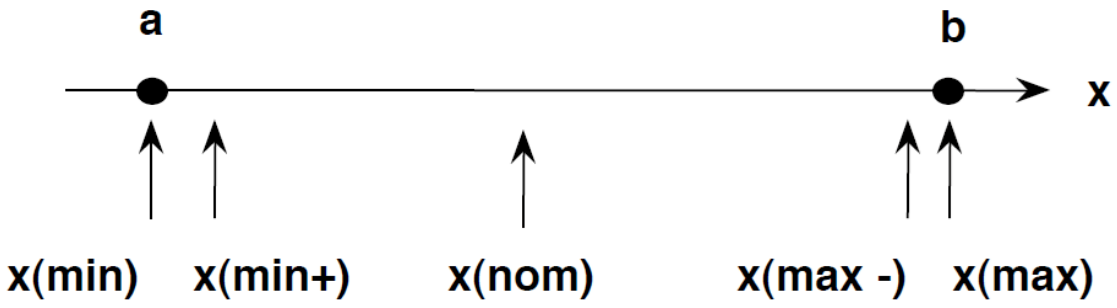
It directly from a requirement specification or black box test design technique. The Techniques include:

- Boundary Value Analysis (BVA)
- Equivalence Partitioning (EP)

Boundary testing: It is the method of testing between opposite ends or boundaries between partitions of the input values.

- Opposite ends like Start- End, Lower- Upper, Maximum-Minimum, Just Inside-Just Outside values are called boundary values and the testing is called "boundary testing".
- The essential idea in boundary value testing is to select input variable values at their:

1. Minimum
2. Just above the minimum
3. A nominal value
4. Just below the maximum



5. Maximum

In this Testing, Equivalence Class Partitioning plays a better role

It comes after the Equivalence Class Partitioning.

Equivalence Partitioning

It is type of black box testing technique which can be applied to all levels of software testing like unit, integration, system, etc. In this,input data units are separated into equivalent partitions that can be used to derive test cases which reduces time required for testing because of small number of test cases.

- It separate input data of software into different equivalence data classes.
- User can apply this technique, where there is a range in the input field.

Alpha Testing:

Itis a testing performed to recognised bugs before releasing the software product to the real users or public. It is a type of acceptance testing. The objective is to refine the software product by finding and fixing the bugs that were not discovered through previous tests..

Advantage of Alpha testing

- Improved insight about the software's reliability at its early stages
- Free up your team for other projects
- Reduce delivery time to market
- Early feedback helps to improve software quality

Beta Testing:It is achieved by users of the software application in a environment. It is one of the type of **User Acceptance Testing.**

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It is the last test before dispatching a product to the customers. Advantage of this testing is direct feedback from customers.

Types of Beta Testing are:

1. **Traditional Beta testing:**

Result is distributed to the target market and related data is gathered in all aspects. This data can be used for Product improvement.

2. **Public Beta Testing:**

Product is distributed publicly to the world through online channels and data can be collected from anyone. Based on feedback, product improvements can be done.

3. **Technical Beta Testing:**

Product is released to a group of employees of an organization and collects feedback/data from the employees of the organization.

4. **Focused Beta Testing:**

Software outcome is released to the market for taking feedback on specific features of the program. For example, important functionality of the software.

5. **Post-release Beta Testing:**

Software product is released to the market and data is collected to make improvements for the future release of the product.

Advantages of Beta Testing:

- It reduces result failure risk via customer validation.
- It allows a company to test post-launch infrastructure.
- It helps in better product quality via customer feedback.
- It creates kindness with customers and increases customer satisfaction.

Difference Between alpha testing and beta testing

Alpha Testing	Beta Testing
It involves both the white box and black box testing.	It commonly uses black box testing.
It is achieved by testers who are usually internal employees of the organization.	It is execute by clients who are not part of the organization.
It is fulfilled at developer's site.	It is performed at end-user of the product.

Security testing are not checked in this testing.	Reliability, security are checked during beta testing.
It ensures the feature of the product before forwarding to beta testing.	It concentrates on the quality of the product but collects users input on the product and ensures that the product is ready for real time users.
It requires a testing environment or a lab.	It doesn't require a testing environment or lab.
It may require long execution cycle.	It requires only a few weeks of execution.

Regression Testing: It is a process of testing thatimprove parts of the code and the parts that may get affected due to the modifications to ensure that no new errors have been launched in the software after the modifications have been made. It means return of something and in the software field, it refers to the return of a bug.

When to do regression testing?

- When a new feature is added to the system and the code has been modified to absorb and integrate that functionality with the existing code.
- When some fault has been recognizedin the software and the code is debugged to fix it.
- When the code is modified to improve its working.
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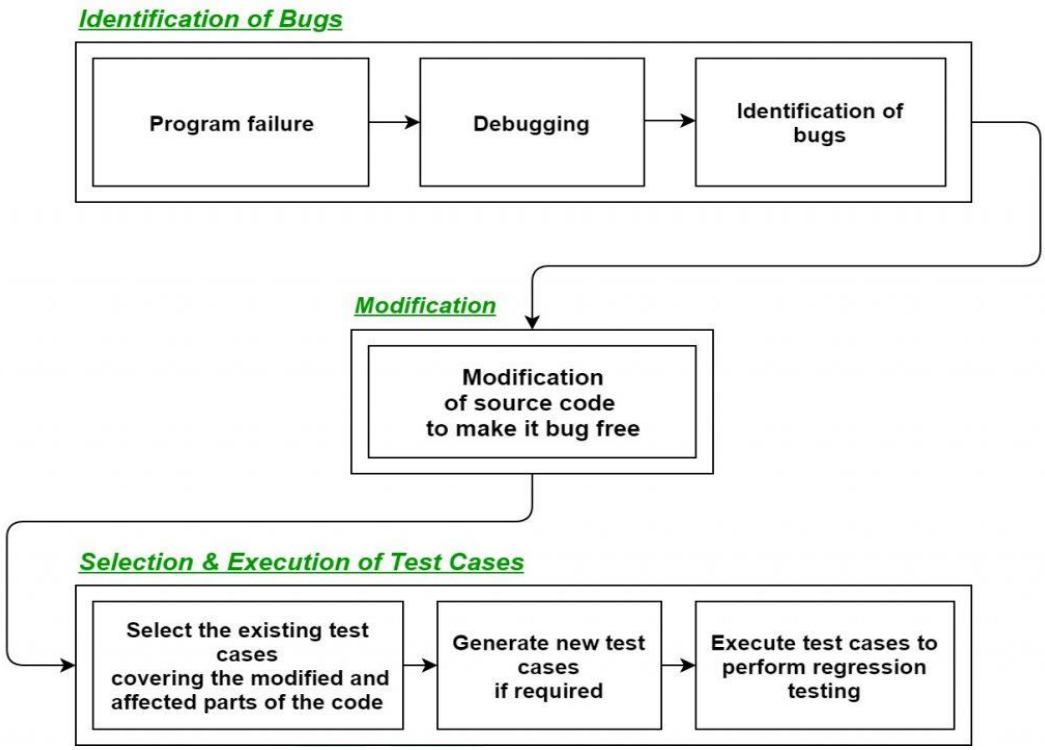
Advantages of Regression Testing:

- It certify that no new bugs has been introduced after adding new functionalities to the system.
- Tests are selected from the manage test suite and user already know their await outputs.
- It helps to manage the quality of the source code.

Disadvantages of Regression Testing:

- It can be time and assets consuming if automated tools are not used.
- It is required after very small changes in the code.



Techniques used in Test cases for Regression Testing:

- **Select all test cases:** In this technique, all test cases arechoose from the already existing test suite. It is the very simple and safest technique but not much well organized.
- **Select test cases randomly:** In this technique, these cases are selected randomly from the existing test-suite but it is only useful if all the test cases are equally good in their issue observation capability which is very rare.
- **Select modification traversing test cases:** In this technique, those cases are selected which covers and tests the alter portions of the source code the parts which are affected by these modifications.
- **Select higher priority test cases:** In this technique, priority codes are allocate to individual test case of the test suite based upon their bug detection capability, customer requirements, etc. Test cases with highest preference are selected for the process of regression testing.

Performance Testing: It certify that software applications perform properly under their expected workload. It is a testing technique carried out to determine system performance in terms of sensitivity, reactivity and stability under a particular workload.

It is the process of analyzing the quality and capability of a product. It is a testing method performed to determine the system performance in terms of speed, reliability and stability under varying workload. It is also known as Performance Testing.

Performance Testing Attributes:

- **Speed:**

It controls whether the software product responds rapidly.

- **Scalability:**

It controls amount of load the software product can handle at a time.

- **Stability:**

It controls whether the software product is stable in case of varying workloads.

- **Reliability:**

It controls whether the software product is secure or not.

Stress Testing: Itis a technique that controls the quality of software by testing after the limits of normal operation. It stress on availability and error handling under a heavy load more than on what is correct behavior under normal situations.

Types of Stress Testing:

1. **Server-client Stress Testing:**Testing is carried out across all clients from the server.
2. **Product Stress Testing:**

It concentrates on discovering defects related to data locking and blocking, network issues and performance congestion in a software product.

3. **Transaction Stress Testing:**

It is performed on one or more transactions between two or more applications. It is carried out for fine-tuning and optimizing the system.

4. **Systematic Stress Testing:**

It is integrated testing which is used to perform test across multiple systems running on the same server. It is used to established issues where one application data blocks another application.

5. **Analytical Stress Testing:**

It is performed to test the system with abnormal parameters or conditions that are unlikely to happen in a real scenario. It is carried out to find issues in unusual strategy like a large number of users logged at the same time or database went offline when it is accessed from a website.

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