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Software Testing Part-1

Software Testing 1 :

Content :

Verification: It is the process of examine that a software achieves its goal without any bugs. It is the process to certify whether the product that is developed is right or not. It verifies that the developed product achieves the requirements that user have.
It is Static Testing.

Activities involved in verification:

1. Inspections
2. Reviews
3. Walkthroughs
4. Desk-checking

Validation: It is a method of checking whether the software product is up to the mark or in other words product has high level requirements. It is the process of examine the validation of product i.e. it checks what we are establishing in the right product. Validation is the **Dynamic Testing**.

Activities involved in validation:

1. Black box testing
2. White box testing
3. Unit testing
4. Integration testing

ERROR: It is a mistake on the part of a software developer. In the strategy of developer user include software engineers, programmers, analysts, and testers. For example, a developer may not understand a design notation, or a programmer might type a variable name incorrectly - leads to an Error. It is generated because of wrong login, loop or due to syntax. It normally arises in software; it leads to change the functionality of the program.

BUG: It is the result of a coding error. Error found in the environment before the product is shipped to the customer. Anerror that causes a program to work poorly, produce incorrect results. It is found in software or hardware that causes a program to malfunction. It is terminology of Tester.

FAILURE: It is the lack of ability of a software system or component to perform its required functions within specified performance requirements. When a failure reaches the end customer it is called a Failure. During development they are usually observed by testers.

FAULT: A wrong step, data definition in a computer program which causes the program to perform in an unintended manner. It is launch in the software asresult of an error. It is annot regularin the software that may cause to behave incorrectly, and not according to its features. It is the result of the error.

Unit Testing: It is a testing procedure by which each unit of source code are tested to determine if they are ready to use. Itstarts with the module specification.

Integration Testing: Integration testing checks integration between software modules.It starts with interface specification.

Unit Testing	Integration Testing
It checks a single component of an application.	The action of integration modules is considered in the Integration testing.
It should have no dependencies on code outside the unit tested.	It is dependent on other outside systems like databases, hardware allocated for them etc.
It starts with the module specification.	It starts with the interface specification.
It comes under White box testing type.	It comes under both type of testing.
The detailed clarity of the code is comes under Unit testing.	The clarity of the integration structure is comes under Integration testing.

White Box Testing:It isa testing method in which internal structure, design are tested to check flow of input-output and to improve design, usability and security. In this code it is visible to testers so that it is also called Clear box testing, Open box testing, Transparent box testing and Glass box testing.

Types of white box testing:

Unit Testing:

This is one of the steps, which is performed in the early stages. Various testers are performing to check if a specific unit of code is functional or not. This is one of the common steps performed for every activity because it helps in removing basic and simple errors.

Static Analysis:

The step involves testing variousof the static elements in the code. The conducts to figure out any of the possible defects or errors in the application code.This is important because it helps in filtering simple errors in the initial stage of the process.

Dynamic Analysis:

It is the further step of static analysis in general path testing. Some of the people prefer performing both static and dynamic at the same time.This helps in analyzing and executing the source code depending on the requirements. The end stage of this helps in analyzing the output without affecting the method.

Statement Coverage:

This is one of the pivotal steps involved in the testing process. It offers a whole lot of advantages in terms of execution from time to time.The method takes place to verify whether all the functionalities are working or not. Various testers use the step because it is designed to execute all the functions once. As the method starts, user will be able to figure out the possible errors in the web application.

Branch Testing Coverage:

Software and web applications are not coded in a repeated mode because of few reasons. It is necessary to branch out at some point in time because it helps in segregating effectively. It gives a wide room for testers to find quick results. It helps in verifying all the possible branches in terms of lines of code. This offers better access to find and rectify any kind of abnormal behavior in the application easily.

Security Testing:

It is a fact that security is one of the primary protocol, which needs to be in place all the time. Many of organisations prefer having a regular security testing activity because of obvious reasons. It is necessary to have a method in place to protect the application or software automatically.It is more like a process because it comes with a lot of internal steps to complete. It checks and rectifies any kind of unauthorized access to the system. The process helps in avoiding any kind of breach because of hacking or cracking practices.

Mutation Testing:

The last step in the method needs a lot of time to complete effectively. It is generally conducted to re-check any kind of bugs in the system.

Black Box Testing

It is a software testing method in which the functionalities of software applications are tested without having knowledge of internal code structure, implementation details and internal paths. It mainly focuses on input and output of software applications and it is entirely based on software requirements and specifications. It is also known as Behavioral Testing.

Types of black box testing:

- **Functional testing** - This type of testing is related to the functional requirements of a system; it is done by software testers.
- **Non-functional testing** - This type testing is not related to testing of specific features ,but non-functional requirements such as performance, scalability, usability.
- **Regression testing** – This type of testing is done after code fixes, upgrades or any other system maintenance to check the new code has not affected the existing code.

S.No.	White Box Testing	Black Box Testing
1	Testing is done with informed of the internal structure of program.	Testing is done without the informed of the internal structure of program or application
2	It requires programming knowledge.	It doesn't require programming knowledge
3	It has the main goal to test the internal operation of the system.	It has the main goal to test the behavior of the software
4	It is focused on code structure, conditions, paths and branches.	It is focused on external or end-user perspective
5	It is a not time-consuming process	It is a time-consuming process.

Basis Path Testing : It is a white-box testing technique based on the control structure of a program or a module.Using this path, a control flow graph is prepared and the various possible strategy present in the graph are executed .
It is a technique of selecting the paths in the control flow graph that provide a group of execution paths through module.

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