White Box Testing:

* White box testing is used to test the internal structure of the source code, so it is also called as Glass or Clear box testing or Structural testing.
* White box testing can be applied to the unit, integration and system levels of the software application.
* It is done by both developers and Testers.It helps to identify any missing logics or code in the program.
* Normally, developers will do whitebox testing and send the software to testing team. Here they will conduct Black box testing against the requirements and find the bugs and resend it to the developers. Developers fix the bugs and perform white box testing again and resend to the testers.
* Main goal or intention of the whitebox testing is to check the code run with the preselected input values to validate the preselected output values.
* Some of the tools to perform Whitebox testing: NUnit, CPPUnit, RCUnit, Veracode , etc.,

Advantages of White Box Testing:

1.We can find bugs and issues in the early stage.

2.It is easy to automate testcases.

3.Optimization of code.

4.It improves the stability and reusability of the application, when testing in more thorough, with coverage of more paths.

Ex: Login page

Disadvantages of WhiteBox Testing:

1.It is Expensive

2.We can test the code, which have written and not possible to identify the missing Functionalities.

3.A skilled program tester is required to test the code.

4.Maintainance of test script is not easy, as they change the requirements very frequently.( if they change the source code, they have to change the Unit test code ( code used to test the source code))

How to perform White Box Testing:

As a tester--- good programming knowledge--- related to the application they are going to test.

Now we have to write testcases and start execution.

Tester will check the source code ---- he will understand it ---- write testcases ----- he will execute ---- if we find any defects or missing logics --- we will resend to developers ---- they fix bugs and again resend it to testers ----until complete bugs got resolved and application is working according to the client requiremnts.

The main agenda of this testing to check the flow and execution of the program, and find the any missing logics.

White box Testing Techniques:

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It includes code coverage analysis, it helps to find the gaps in a testcases, and identifies the unused code in the program, improves the quality of the product.

Statement coverage technique

Branch coverage technique

Decision coverage technique

Path coverage technique

Loop coverage technique

Contral flow technique

Statement Coverage Technique:

1. One of the technique used to design the white box testcases.
2. This technique is conducted to ensure each line of code tested atleast once
3. It also called as Linear coverage or Stepwise coverage.
4. Statement coverage = No. of Statements executed/ total no. of statements\*100

What is covered by statement coverage:

1. Unused code
2. Dead code
3. 3.Unused branches
4. Missing statements

EX: no of statements executed = 50

Total no. of statements = 100

Statement coverage = 50/100\*100 = 50 lines of code we have coverd.

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Description automatically generated

Testcase1: If n1 = 10, n2=20, n3=30

if(10>=20&&10>=30) --- false(not executed)

Else if(20>=10&&20>=30) ---( T&&T =T

T&&F =F) ---- false(not executed)

Else ( 30 is the largest no.)(is executed)( 1,2,3,8,9,10)

Testcase2: if n1=40, n2=30, n2=20

Testcase3: if n1=10,n2=30,n3=20

Statement coverage:6/10\*100 =60% lines are covered.

Advantages of Statement coverage:

It measures quality of code

It verifies each statement will be executed atleat once or not.

It check which block of code is not been executed.

Disadvantages of Statement coverage:

1.It does not check the false statements

It fails to tell code terminations