Functional and Structural Testing.

Software Testing can be majorly classified into two categories:

1. **Black Box Testing** is a software testing method in which the internal structure/ design/ implementation of the item being tested is not known to the tester

   Functional testing addresses the overall behavior of the program by testing transaction flows, input validation, and functional completeness. Functional testing is considered black-box testing because no knowledge of the internal logic of the system is used to develop test cases. System testing, regression testing, and user acceptance testing are types of functional testing.

2. **White Box Testing** is a software testing method in which the internal structure/ design/ implementation of the item being tested is known to the tester.

   Structural testing is considered white-box testing because knowledge of the internal logic of the system is used to develop test cases. Structural testing includes path testing, code coverage testing and analysis, logic testing, nested loop testing, and similar techniques. Unit testing, string or integration testing, load testing, stress testing, and performance testing are considered structural.

Differences between Black Box Testing vs White Box Testing:

BLACK BOX TESTING	WHITE BOX TESTING
It is a way of software testing in which the internal structure or the program or the code is hidden and nothing is known about it.	It is a way of testing the software in which the tester has knowledge about the internal structure or the code or the program of the software.
It is mostly done by software testers.	It is mostly done by software developers.
No knowledge of implementation is needed.	Knowledge of implementation is required.
It can be referred as outer or external software testing.	It is the inner or the internal software testing.
It is functional test of the software.	It is structural test of the software.

BLACK BOX TESTING	WHITE BOX TESTING
This testing can be initiated on the basis of requirement specifications document.	This type of testing of software is started after detail design document.
No knowledge of programming is required.	It is mandatory to have knowledge of programming.
It is the behavior testing of the software.	It is the logic testing of the software.
It is applicable to the higher levels of testing of software.	It is generally applicable to the lower levels of software testing.
It is also called closed testing.	It is also called as clear box testing.
It is least time consuming.	It is most time consuming.
It is not suitable or preferred for algorithm testing.	It is suitable for algorithm testing.
Can be done by trial and error ways and methods.	Data domains along with inner or internal boundaries can be better tested.
Example: search something on google by using keywords	**Example:** by input to check and verify loops
Types of Black Box Testing: • A. Functional Testing • B. Non-functional testing • C. Regression Testing	**Types of White Box Testing:** • A. Path Testing • B. Loop Testing • C. Condition testing

Both methods together validate the entire system. For example, a functional test case might be taken from the documentation description of how to perform a certain function, such as accepting bar code input.

A structural test case might be taken from a technical documentation manual. To effectively test systems, both methods are needed. Each method has its pros and cons, which are listed below:

Structural Testing

Advantages

The logic of the software's structure can be tested.
Parts of the software will be tested which might have been forgotten if only functional testing was performed.

Disadvantages

Its tests do not ensure that user requirements have been met.
Its tests may not mimic real-world situations.

Functional Testing

Advantages

Simulates actual system usage.
Makes no system structure assumptions.

Disadvantages

Potential of missing logical errors in software.
Possibility of redundant testing.