

Coding

In this phase, we implement the design into an actual program, using a programming language available. In some situations, algorithms are first written before converting the algorithm into a language, and in other cases too, the design output is sufficient for the code implementation. In this course, we will use Java as the language for code implementation.

Testing/Debugging

Testing refers to the checking of the validity, accuracy, quality, and robustness of a program through the use of real-world data. When implementation is completed, the testing phase follows before the actual use of the program. Here, we run the program using a different set of data to verify that the program runs according to the specifications. There are two types of testing: these are unit and integration.

Unit Test: A test that is performed on an individual class.

Integration Test:

A test is performed on several classes in a program to determine whether classes work together correctly. Programmers almost always encounter errors during programming. An error is a mistake in a program that prevents the smooth running of the program and accurate output from the program. In a software environment, errors are called bugs. During testing, we find and correct all errors/bugs that may occur. The process of finding and correcting errors in a program is termed debugging.

An error can be categorized under logical, syntactic, or run-time.

A logical error is an error that occurs as a result of the programmer's reasoning or oversight. For instance, if the statement $y = x + 5$ is required at a point in the program and the programmer mistakenly writes it as $y = x * 5$, the result of the expression will yield an error – wrong output. Logical errors are normally seen when the program is running.

A syntax error is an error that may occur as a result of writing instructions that are not supported by the language in question. For instance, in Java, to declare an identifier, the data type should be specified followed by the name of a variable,