

# Difference Between Compile-Time Error and Runtime Error

In software development, compile-time errors and runtime errors are programming terms that are used widely. These errors arise in the program either while compilation or run time. The difference between compile-time errors and runtime errors is given in the table below.

## Key Differences Between Compile-Time Error and Runtime Error

Compile-Time Errors	Runtime Errors
The compiler detects them.	The compiler does not detect them.
They hinder the execution or running of the complete code, as the compiler detects the error.	They hinder the complete execution of the code.
It can detect lexical, syntactic, and semantic errors only.	It can detect logical errors in the code, divide by zero, square root of a negative number, etc.
They can be fixed during the development of code.	They can be fixed after the execution of the code.

## Compile-Time Error and Runtime Error

When a code is executed on a compiler, it may generate errors, and these errors are categorized into two types: Compile-time errors and Runtime errors. Let us understand each type of error in detail.

### What is a Compile-Time Error?

The errors occurring due to the violation of the programming language's syntax are called compile-time errors. The user can fix these errors by making required changes in the source code before compiling it. They are called so because these are generated after processing the source code through the seven phases of the compiler.

There are a variety of compile-time errors that a programmer encounters on a day-to-day basis. Some frequently occurring compile-time errors are missing parenthesis, missing semicolons, using the variable without declaring it, etc.

## What is Runtime Error?

The errors occurring at the runtime after the successful compilation are called runtime errors. A compiler cannot detect these errors as the compiler has a limited capacity. A compiler can only detect lexical, syntactic, and semantic errors. This compiler limitation adds to the difference between compile-time and runtime errors.

The runtime errors are difficult to identify by the programmer or compiler. Some runtime errors are as follows: logic error, segmentation fault, divide by zero, etc.

