**Syntax errors**

A syntax error occurs when the code given does not follow the syntax rules of the programming language. Examples include:

* misspelling a statement, ex writing pint instead of print
* using a variable before it has been declared
* missing brackets, ex opening a bracket, but not closing it

A program cannot run if it has syntax errors. Any such errors must be fixed first. A good integrated development environment (IDE) usually points out any syntax errors to the programmer.

**Logic errors**

A logic error is an error in the way a program works. The program can run but does not do what it is expected to do.

Logic errors can be caused by the programmer:

* incorrectly using logical operators, ex expecting a program to stop when the value of a variable reaches 5, but using <5 instead of <=5
* incorrectly using Boolean operators
* unintentionally creating a situation where an infinite loop may occur
* incorrectly using brackets in calculations
* unintentionally using the same variable name at different points in the program for different purposes
* using incorrect program design

Unlike a syntax error, a logic error does not usually stop a program from running. The program will run, but not function as expected.

## Runtime errors

A runtime error is an error that takes place during the running of a program.

An example is writing a program that tries to access the sixth item in an array that only contains five items. A runtime error is likely to crash the program.