

# Chapter 5

## Types of Errors

### Debugging

Debugging refers to the process of finding and correcting bugs (errors) in your program.

### Errors and Exceptions

Errors and exception both disrupt a program and stop its execution.

Error ,called a bug in the code that prevents a program from compiling and running correctly.

Exception is a irregular unexpected situation occurring during execution on which programmer has no control

Real life example:

If you operate an ATM then

Entering a wrong pin is an error

Not that much amount in account is an exception

### Types of Errors

1. Compile time errors

- a) Syntax errors
- b) Semantics errors

2. Runtime errors

3. Logical errors

# Compile time Errors

Error that occur during compile time are compile time errors.

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Two types of compile time errors are

## 1. Syntax error

Syntax refers to the rules governing the construction of valid statements in a language

Syntax errors occur when rules of a programming language are misused that is when a grammatical rule of Python is violated

Eg: `print "hello"` is a syntax error missing parenthesis (correct code `print ("hello")`)

`if x=(x*y) # = is not a relational operator` (correct code `if x==(x*y):`)

## 2. Semantics errors

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Semantics refers to the set of rules which give the meaning of a statement.

Semantic errors occur when statements are not meaningful

Example: `x*y=z` #it should be `z=x*y`

# Run Time errors

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Errors that occur during the execution of a program are run time errors.

Some run time errors stop the execution of the programs which is then called program crashed or abnormally terminated.

Example: infinite loop

# Logical Errors

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This error is caused because of the programmer's mistaken analysis of the problem he is trying to solve.

Example: use of variable before initialization, unmarked end for a loop.

Logical errors are basically sub category of runtime errors

## Exercise

1. Write and explain the compile time errors with example.
2. What is run time error?
3. Define logical error.
4. Define debugging and exception.