Algorithm - a sequence of steps/instructions that can be followed to complete a task.

3 Programming Constructs

Sequence
In a sequence structure, an action or event leads to the next in a predetermined order.

qty = input()
*total = qty * price*
print(total)

1

Selection
A question is asked, depending on the answer the program takes one, two or more courses of action.
x = input()
if x > 5 :
    print("too big")
else:
    print("just right!")

2

Iteration
A process wherein a set of instructions or structures are repeated in a sequence a set number of times or until a condition is met.

for count in range(1,11):
    print("ROVERS!")

3

Variable – Sometimes we need computers to remember the information we give it. A variable can be thought of as a box (memory location) that the computer can use to store a value. The value held in the box may change or vary. A program can use as many variables as it needs.

A variable is made up of three parts:
- A name (identifier)
- A type **(data type – see below)**
- A value (what you are storing)
name = "Mr Rifai"
*The variable is called **name**, its data type is a **string**, and its value is **Mr Rifai***

DATA TYPES

String	Combination of characters that appear on the keyboard (alphanumeric)
Integer	A whole **number**

Assignment - In order to change the data value stored in a variable, you use an operation called assignment. Different values may be assigned to a variable at different times during the execution of a program.

x = 5   *#here we are assigning 5 to the variable **x***

name = input()   *#here whatever the user types in will be assigned to the variable, name.*

IDE's

An **integrated development environment** (**IDE**) is an **application** used to create software (programs). It provides you with a code editor (a place to write your code!)

IDLE	An IDE we have used to create python programs
Pyscripter	Another IDE we have used to create python programs!

Features of IDE's	IDLE	Pyscriptor
Syntax checks. This recognises incorrect use of syntax and highlights any errors.	✓	✓
Translator. This allows you to **run/execute** the code you have written	✓	✓
Auto-completion. As you start to type the first part of a function, it completes the line for you!		✓
Syntax highlighting. Colour codes your code! E.g. strings in green when using IDLE	✓	✓

There are 2 types of iteration:
1. **Indefinite** – code is repeated (iteration) continues until some **specified condition is met**.
   e.g. **WHILE** loop
2. **Definite** – code is repeated (iteration) is carried out a **set number of times**.
   e.g. **FOR** loop.

IN PYTHON

```
x = 1
while x < 6:
    print x
    x = x + 1
```

```
for x in range(1,6):
    print x
```

Up to but NOT including 6!

x starts at 1. We then enter the WHILE loop. x is less than 6 so we will print x and add one to x. x is now 2, still less than 6 so we print and continue…

Above is a FOR loop. x will start at 1 and then be printed. x will then be 2 and get printed….this will continue till x is 5!

The code for each of the programs above outputs the same thing, 1,2,3,4,5.