

# Control flow model of Python Programming Language

## ① Indentation Level :

```
def testFunction(a, b):  
    print ('a:', a, 'type(a):', type(a)).  
    print ('b:', b, 'type(b):', type(b))
```

Single Statement

Assignment Statement:

m = 10 1 line = 1 statement

Function Call Statement

```
print ('a:', a) 1 line = 1 statement
```

Statements in language which span over multiple lines

and made up by combining smaller statements are

known as **BLOCK STATEMENT**

BLOCK STATEMENTS ARE MADE OF TWO SYNTACTIC

COMPONENTS : (A) HEADER (B) BODY.

```
def testFunction(a, b): <----- HEADER
```

```
    print ('a:', a, 'type(a):', type(a)).  
    print ('b:', b, 'type(b):', type(b))
```

Body.

In other programming languages:

Header

{  
  |  
  | Body

Opening Curly Bracket

}  
  |

Closing Curly Bracket

untitled	1-10x
[	
IL0	IL1
IL2	IL3
IL4	
Ln: 1 C: 0	

IL-K = Column Number - 4xK

```
>>> print('Hello')
```

Hello

```
>>> print('Hello').
```

```
>>> | 1  
  | 4
```

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untitled	File	Save
<pre> n=10 print(n) def test(a,b):     print(a)     print(b) m=500 print(m) test(10,20) </pre>		
IL0	IL1	IL2
IL3	IL4	
		Ln: 1 C: 0

Rule One: Each statement in Python must start at some indentation level that is it must start at a column number which is a multiple of 4.

(e.g. C0, C4, C8 etc.)

By default you must start a new statement at C0. In order to start statement at other indentation levels, there must be a specific need (such as statement belongs to the body of some block statement)

Rule Two: How Python uses indentation levels to delimit the body?

A block statement in Python has two syntactic elements as we have seen above, (a) header (b) body.

Python's Rule:

**IF HEADER OF BLOCK STATEMENT IS AT INDENTATION LEVEL K  
THEN ALL STATEMENTS BELONGING TO BODY MUST START AT INDENTATION  
LEVEL (K+1)**

How body gets delimited by the above rule?

- (a) When we shift indentation level from k to k+1 : it marks the start of the body. The first statement at indent level k+1 is the first statement of the body.
- (b) When we shift indentation level back to k (or lower numbers) it marks the end of the body. The statement where we lower indentation level for the first time does not belong to the body.

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## CONTROL FLOW MODEL OF PYTHON PROGRAMMING LANGUAGE.

The Python Interpreter is programmed to execute **ALL STATEMENTS AT INDENT LEVEL 0**, in a given source code, in an order they appear in the source code.

The lines at other indentation levels (such as IL 1, IL 2) will be executed only if they are required to fulfill the execution of statement at indentation level 0.

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