PYTHON

* **What is python?**

It's simple and most popular programming language.

It can be used for :

- Web development
- Software development
- Mathematics.
- Image Processing.
- A.I, Robatics.

* **Why Python?**

Python is simple yet powerfull ~~asasi~~ can work on multiple platform, support vast libraries, simple as English language, Easy to track Errors.

* **What is Variable?**

It's a kind of entity where we use to store data which we can process / run.

There are ~~by~~ two types of variable:

- Local Variable: Variable created locally when the functions starts it's execution and are lost when the function ends.
- Global variable: Variable are created as the execution of programme begins and lost when programme ends.

Most common built-in python datatype.

Variable type	Description	Example
Numbers	int - integer long - long integer float - floating point Complex numbers	-1, 2, 3 4.6, 2.3 2+3i
String	Characters in single or double quates	'Python' "Python"
List	Number or string inclosed inside sq. bracket seperated by comma. Elements can be edited, changed inside list.	[2,3,10,4] ['a','x','y'] [2,3,'x','y',4]
Tuple	Number or string stared inside round bracket separated by comma, once created can't be changed.	(2,4,9,'x') ('X','10','A')

* **Function**

It's a block of code which only **runs when called**. We need to call function followed by parathesis to use function.

EX -

len( ) - used to measure length of given data.

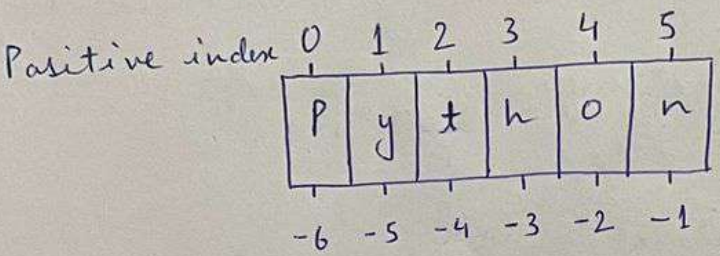
Similarly,

count( ), min( ), max( ), append( )

* ## Indexing in python.

Index() method helps us to find the index position of an element or an item in a string of characters or a list of items.

Ex - Alloting index no to string 'Python' = s



$\Rightarrow$ s[3] = 'h'

Ex - L = [2, 4, 10, 7.2, 6]

	0	1	2	3	4	→ Positive index
=	[2	, 4	, 10	, 7.2	, 6]	
	-5	-4	-3	-2	-1	→ Negative index

$\Rightarrow$ L[-4] = [4]

$\Rightarrow$ L[0:3] = [2, 4, 10, 7.2]

* ## Slicing in Python

Slice() function returns a slice object used to specify how to slice a sequence.

Ex - a = (4, 6, 'x', 3, 'y')

x = slice(2, 3, 1) = a[x] = ('x', 3, 6)

L = [2, 4, 10, 'X', 'xy2', 100]

L[2:5] = [10, 'X', 'xy2']

* Operators in Python

Operators are special symbols used to perform operations on variables and values.

- Arithmetic operators: Used to perform mathematicals operations like addition, subtraction, multiplication etc.

Ex- Operator	operation	Ex-
+	addition	2 + 3 = 5
-	Subtraction	10 - 15 = -5
/	Division	10 / 2 = 5
%	Modulo	9 / 4 = 1
**	Power	2 ** 2 = 4
		...etc

- Assignment operators: Operators used to assign values to variables.

Operator	Name	Example
=	Assignment operator	x = 1
+=	Addition operator	a += 1 or a = a + 1
*=	Multiplicaton "	a *= 2 or a = a * 2
%=	Remainder "	a %= 2 or a = a % 2
		...etc

- Comparison Operators: Operators used to compare two values/variables

Operator	Meaning	Example.
==	Is equal to	3 == 3
!=	Not equal to	3 != 4
<	Less than	3 < 4
>=	Greater than or equal to	4 >= 2
		... etc.

- **Logical operators**: Operators used to check whether an expression is True or False. **Used in decision-making.**

Operator	Example	Meaning.
and	a and b	logical AND
or	a or b	logical OR
not	not b	logical NOT
		... etc

- **Bitwise operators**: Operators that act on operands as if they were **strings of binary digits**.

Operator	Example	Meaning
&	x & y = 0	Bitwise AND
|	x | y = 14	Bitwise OR
^	x ^ y = 14	Bitwise XOR
>>	x >> 2 = 2	Bitwise right shift
		... etc.

- **Python special operators**: special types of operators like identity, membership comes in this category.

Operator	Meaning	Example
is	if the operands are identical	x is True
is not	if the operands are not identical	x is not True

- **Membership operators**: Operators used to test whether a value/variable is found in a sequence.

Operator	Meaning	Example.
in	if the value/variable is found in the sequence	5 in x
not in	if the value/variable is not found in the sequence	5 not in x

* **Dictionary in Python:**

Data stored in key, value pairs separated by colon (':') enclosed inside Braces ({}).

Ex - { 'Name' : ('Raj', 'Amit', 'Alok'), 'X' : 'Y',
4 : 10 , 10 : 40 }

'X' : Key, 'Y' : Value

Note :- Key must not be same