**Python**

**Programming Language:**

* Programming is a way to instruct computer to perform various tasks.
* First Programming Language is **For**mula **Tran**slation => FORTRAN invented by John Backus
* Python was invented by Guido Van Rossum, on Feb 20, 1991.

**Why should we learn Programming Python:**

* Machine Learning
* Web Framework
* Image Processing

**Versions and Release:**

* Released on 1991
* Python 2.0 – 2000
* Python 3.0 – 2008

**Installation of Python:**

* Follow instructions from web

**Programming Life Cycle:**

High Level Languages (HLL): - C, C++, Java, Python

Low Level Languages (LLL): - 0, 1

**Conversion of HLL to LLL/machine code:**

* **Compiler:** Converts HLL to machine code in one session. Eg: C, C++, Java
* **Interpreter:** Converts to machine code line by line (statement by statement). Eg: Python, Perl, Matlab
* **Assembler:** Converts assembly language into machine code.

**Note:**

* **Translator:** Generic term that could refer to a compiler, assembler or interpreter. Anything that converts HLL code into another HLL or LLL.
* So, compilers, interpreters and assemblers are also known as translators.
* All of these translators are programs themselves.

**IDLE:** Integrated Development & Learning Environment Eg: Python Interpreter

**IDE:** Integrated Development Environment Eg: Notepad++, Pycharm, Visual Studio

* Print() function in python will let us write to console output.

Difference between Compiler and Interpreter:

**Compiler:** It converts entire source code of a programming language into machine code.

- Compiler takes the large amount of time to analze the entire source code but the overall execution time of the program is faster.

Eg: C, C++, Java

**Interpreter:** Interpreter takes the source code and runs it line by line translation each line as it comes to it.

- Interpreter takes less amount of time to analyze the source code but the overall execution time of the program is slower.

Eg: Python, Perl, Matlab

**Is python scripting language or programming language?**

**- Scripting Language:** A scripting language is a programming language that is interpreted.

- All the scripting languages are considered as programming languages.

- Python is **scripting, general-purpose, high-level and inerpreted programming language.**

**KEY WORDS & IDENTIFIERS**

- Keywords are the words that are reserved

- You can't use them for variables, classes, functions etc.

- Keywords are case sensitve.

// Type keywords in python shell to see keywords

- help()

- Keywords - 35

- Case sensitive

// If we type if keyword then we'll get to know the details, description about it.

**Identifier**

**Rules for writing Identifiers:**

Mandatory:

- Case Sensitve: num1, Num1 both are different.

- Can be combination of uppercase, lowercase, digits or underscore

- An Identifier can't start with digit.

- Don't use special symbols: @, !, #, %, etc

- Can be of any length

**Statement**

Any executable instruction that tells computer to perform a specific action is called a statement.

**Multi-line statements:** Statements can be extended to one more lines using paranthesis (), braces {}, brackets [] etc.

**Note**: Any executable instruction that tells computer to perform a specific action is called a statement.

**Block**

Group of statements is called a block

**Note:** Python uses indentation to highlight the code

**Comments**

- Information that the developers provide to understand the code

- Improves readability of the program

**Single Line comments**

# is used to comment single lines

**Multi Line comments**

Sarts with ''' ends with '''

or

Starts with """ ends with """

**Note:**

- Documenting and help other programmers.

- These comments are not part of your program. For this reasong, comment statements are askiped while executing your program.

- Debugging

**Variables and constants**

**-** Variables are used to store data (values)

- When you declare a variable, it occupies some space in the memory

- Variable - Can be cahnged at any time

**Declaring a Variable**

In c, C++, Java etc we have to set the data type of the variable

Eg: Java

int marks = 450;

**Note:** No need to set the data type of the variable in Python

use

print (type(<variable>))

**Multiple variable assignmens**

If each value is same.

a = b = c d = 40

Note:

- We won't use it most of the time.

- Few points to keep in min while declaring variables

- type(identifier)

**Points to keep in mind while declaring variables**

- Variables can not start with numbers

- Variables can't have special charecters

- Variables can not be match with keywords

- Variable names should be written in camelCase. (Good to use).

**camelcase**

**-** camelcase is a naming convention in which the first letter of each word in a compound word is capitalized, except for the first word.

Eg: totalMarks, personName, cityAddress

**Constants**

- Which will not change once assigned

-We can't declare a variable/identifier as constant in python

- But the naming convention is use **CAPITAL LETTERS**