Python

Python is a programming language that combines the features of C and Java. It offers the elegant style of programming. Python offers classes and objects like Java.

History

Python was developed by Guido Van Rossum in the year 1991. at the center ~~of~~ for Mathematics and computer science manged by the Dutch Goverment. Van Rassum was working on a project to develop the system utility in C where he had to interact with Bourne shell avaliable in UNIX. He felt the necessity of developing a language that ~~would~~ would fill the gap between C and the shell. This led to creation of python.

Features of python

1. simple
2. Easy to learn
3. open source
4. High level language
5. Dynamically typed
6. Plateform Independent
7. portable
8. procedure and object oriented.

Execution of a Python Program

We write a python program with the name x.py. Here x is the program name and .py is the Extension name.

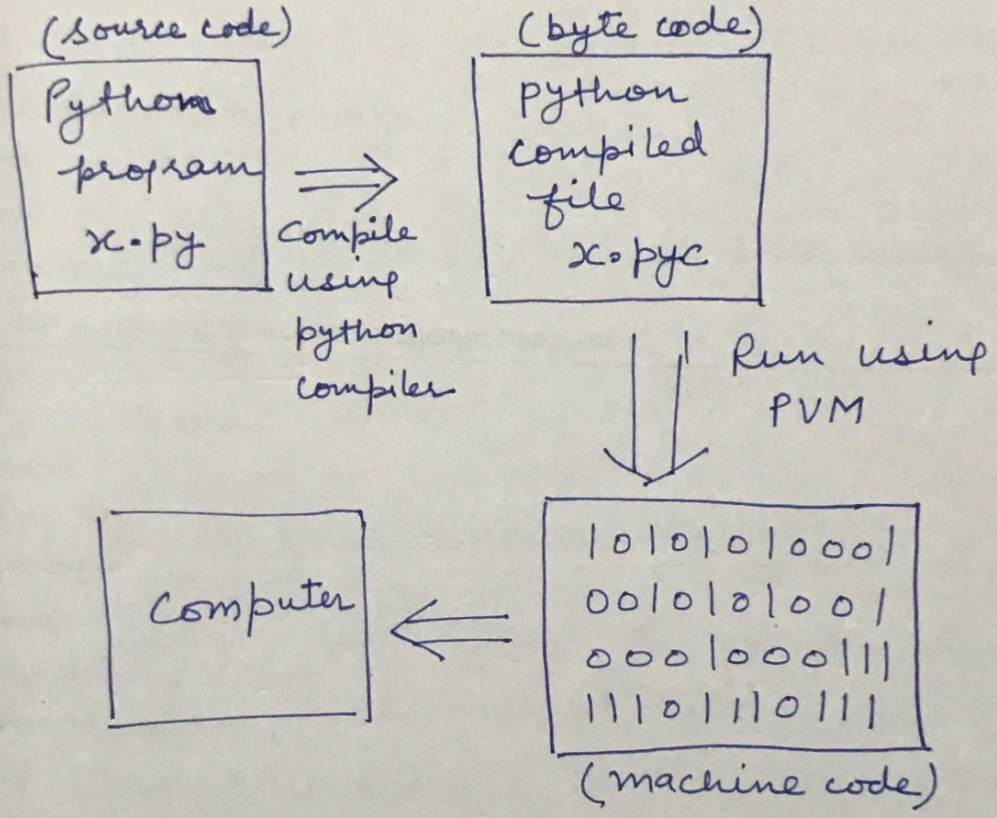
Every python program is typed with an extension name .py. After typing the program the next step is to compile the program using python compiler. The compiler converts the python program into another code called byte code.

Byte code represents a fixed set of instructions that represents all operations like arithmatic, memory related etc. which run on any operating System and hardware. It means the byte instructions are system independent or plateform independant. The size of each byte code instruction is 1 byte. and hence they are called with the name byte code. These byte code instructions are contained in the file x.pyc. Here, the x.pyc file represents a python compiled file.

The Next step is to run a python program. If we directly give the byte code to the computer, it can not Execute them. Therefore it is necessary to convert byte codes to machine code. so that our computer can understand and execute.

for this purpose, we should use PVM (Python Virtual Machine).

PVM uses an interpreter which understand the byte codes to machine code. These machine code instructions are then executed by the processor and results are displayed.



Comments in Python

1) Single line comment :-

These comments starts from symbol (#) and are useful to mention that the entire line till the end should be treated as comment.

for Example

```
# To find the sum of two numbers.
a=10
b=20
print(a+b)
```

2) Multi line comments :-

When we want to mark several lines as comment then ('''...''') tripple single quotes or ("""...""") tripple double quotes are used as comments.

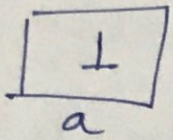
How Python sees variables

In programming language like C, java ~~any~~ and many other languages, the concept of variable is connected to memory location.

for Example :-

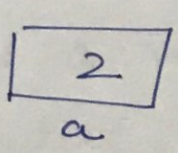
Some memory is allocated with the name 'a' and there the value '1' is stored.

Here we can imagine the memory as a box or container that stores the value. as shown



In this way, for every variable we create, there will be a new box created with the variable name to store the value. If we change the value of the variable, then the box will be updated with new value.

for Example



This is how variables are seen in other languages. but in Python a variable is seen as a tag (or name) that is tied to some value. For Example

$$a = 1$$

means the value '1' is created first in memory and a tag by the name 'a' is created as.

$$a \rightarrow 1$$

Python considers the value '1' as objects. If we change the value of a as

$a = 2$

then the tag is simply changed to the new value as $a = 2$.

$a \rightarrow 1$

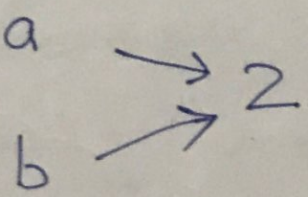
$a \rightarrow 2 \quad 1$

Since the value '1' becomes unreferenced object, it is removed by garbage collector

Assigning one variable to another variable makes a new tag bound to the same value.

$b = a$.

Here the value of a is equal to b then



A new tag b is created that refers to '2'.