DataTypes

In [ ]:
```
Data + Types -->Represents the type of Data that we are using in our program.That we are using
inside a variable
Note--> In python we need not to define the data expliclity Internally PVM will automatically determine
        the datatype and based on that datatype memeory will be allocated at the runtime
```

In [ ]:
```
PVM --> Python virtual machine
```

Important Functions

In [ ]:
```
type()--> that is used to give the type of data that we are using inside our program
```

Example

In [4]:
```
x=10
print(type(x))
y="Pratyush Srivastava"
print(type(y))
```
```
<class 'int'>
<class 'str'>
```

Types of Datatypes

In [ ]:
```
Types of Datatype in Python?

1.Numeric Datatype: Int, Float , Complex
2.Sequence Datatype : List, String , tuples
3.Boolean Datatype: True and False
4.Dictionary
5.Set
```

Numeric Datatype

In [ ]:
```
Numeric Datatype:
    Integer Datatype --> Represents the integral values
    Positive Intgerals --> 0,1,2,3,5,......................
    Negative Integrals --> -1,-2,-3.-4,-5,-6,-7,-7
Note : If we want to represent any data without decimal point then we will use integer datatype.
       In python there is no any limit for declaring the integar datatype
```

Examples of Integer Datatype

In [5]:
```
x=10
type(x)
```
Out[5]:
```
int
```

In [6]:
```
x=-99
type(x)
```
Out[6]:
```
int
```

Float Datatype

In [ ]:
```
Float Datatype --> represents that floating point values(decimal format)
--> float positive numbers--> 0.0,0.1.....;.
--> float negative numbers -->-1.0,0.2......
```

Examples of Float Datatype

In [7]:
```
x=10.5
type(x)
```
Out[7]:
```
float
```

In [8]:
```
x=-10.5
type(x)
```
Out[8]:
```
float
```

Complex Datatype

In [ ]:
```
#Complex Number
A number which is in the form of:
    a+bj
a-> real part(real number)
b--> imaginary(imaginary number)

j^2-->-1
j --> (-1)*1/2
```

Example of Complex Datatype

In [2]:
```
x=10.0-20j
type(x)
x.imag
```
Out[2]:
```
-20.0
```

In [1]:
```
x=10+(-20j)
x
```
Out[1]:
```
(10-20j)
```

In [3]:
```
x = 10+20
type(x)
```
Out[3]:
```
int
```

In [4]:
```
x=10+20j
type(x)
```
Out[4]:
```
complex
```

In [5]:
```
y=10+30j
x=10+20.0
print(type(y))
print(type(x))
```
```
<class 'complex'>
<class 'float'>
```

In [ ]:
```
Note 1: imag is used  to access imaginary part of complex number
        real is used to access real part of complex number

Note 2: Complex datatype are used in scitific application(scientific computations)
        thatswhy nasa and drdo are usi are preferring python as there first programming language.
```

Boolean Datatype

In [ ]:
```
Boolean simple means either true or false.
Internally True is equal to 1
           False is equal to 0
```

In [7]:
```
x=True
print(type(x))
```
```
<class 'bool'>
```

In [8]:
```
x=True+True
x
```
Out[8]:
```
2
```

In [9]:
```
x=True+False+True+False-False-False+True+True-False-False
type(bool(x))
```
Out[9]:
```
bool
```

In [10]:
```
x=True+20
x
```
Out[10]:
```
21
```

String Datatype

In [ ]:
```
Strings --> String is the sequence or a collection of characters within single quotes or double quote.
Note:1. If you are representing anything within a single quotes(' ')/Double quotes(" ")
        than that is always
        be considered as a string in python.
     2. In python we don't have char datatype if we want to represent a single character
        in python then that is also be considered as a string.

In Java we can represent char datatype with the help of single quotes('')
In Java we can represent String with the help of double quotes(" ")
```

Example of String Datatype

In [38]:
```
x='Avinash=10'
type(x)
```
Out[38]:
```
str
```

In [30]:
```
x="10.5"
type(x)
```
Out[30]:
```
str
```

In [31]:
```
x='10'
type(x)
```
Out[31]:
```
str
```

In [32]:
```
x="True"
type(x)
```
Out[32]:
```
str
```

In [33]:
```
x="10+20j"
type(x)
```
Out[33]:
```
str
```

In [35]:
```
x="h"
print(type(x))
```
```
<class 'str'>
```

In [36]:
```
x='h'
print(type(x))
```
```
<class 'str'>
```