**Python IDEs:**

Pycharm –Best IDE

Spyder

Eclipse

**Advantage of Python:**

1. Concise code
2. Rich Libraries
3. Easiness to programmer
4. Freeware

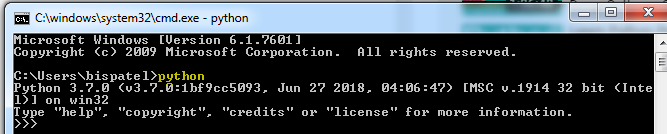
Python is an interpreted language. Python VM has inbuilt functionality to compile.

**How to install Python:**

1. <https://www.python.org/>



1. Python 2 and Python 3 are different and not compatible. Python 3 is developed as independent language. Highly recommended to go for Python 3. After 2020 there won’t be any support for Python 2.
2. To check if python is installed:



1. Environment variable:

C:\Users\bispatel\AppData\Local\Programs\Python\Python37-32; C:\Users\bispatel\AppData\Local\Programs\Python\Python37-32\Scripts

1. **Python REPL (Read Evaluate Print Loop) Tool**: Python IDLE

Without writing big code we can check the logic

1. To open python in command line: **py**

Ex: Read a number from command prompt and write Hello that many times.

1. Create a .py file
2. To run a .py file Run🡪Run Module or click “F5”.
3. To run from command prompt:

Python filename.py

Py filename.py

**To read a number:**

n = int (input ("Enter some number:"))

**To loop through:**

for i in range(n):

print("Hello");

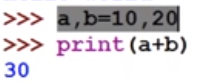
**To print a line:**

Print(“Hello”);

**Python Module:**

1. Core Python
2. Advanced Python

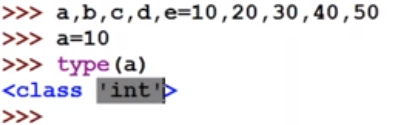
To add 2 numbers:



10 and 20 will be assigned to a and b respectively.

C, Java === Statically Typed Programming Language

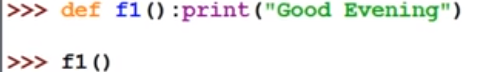
Python== Dynamically Typed Programming Language



Types will be assigned automatically based on the provided value.

Syntax from C and ABC language.

Functional Programming:



**Python** is a general purpose high level programming language (Human readability)

Guido Van Rossam =🡺1989 developed. 1991 it was available to public.

**Where we can use Python:**

1. Desktop Application
2. Web Application

Django is the framework to develop web application in Python.

1. Database Applications
2. For Networking application
3. Games
4. Data Analysis
5. Machine Learning
6. AI
7. For IOT applications

**Python features:**

1. Functional Programming from C
2. OOP from C++
3. Scripting language features from Perl and Shell script
4. Modular programming features from Module-3

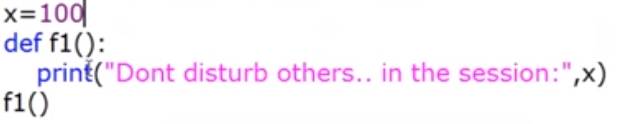
**Advantages**:

1. Simple and easy to learn
2. In Java 53 keywords are there. However, In Python only 30 keywords.
3. Free ware (We are not required to pay anything for license) and open source (We are able to see the source code)
4. High level programming language.
5. Platform Independent. (Write Once and Run Anywhere)
6. Portability: Moving from one platform to another without changing anything.
7. Dynamically typed program (Based on the value provided to a variable, the type will change dynamically)
8. Both Procedure Oriented and Object Oriented.
9. Interpreted language
10. Extensible ---Native method support is there. Whatever other languages code we can use in Python. In Java we have some code with 1 lakh line. We can use python to improve the performance.
11. Embedded
12. Extended libraries

**Limitations**:

1. Performance wise not good as it is interpreted language.
2. Mobile applications are not there.

Without having the class, we can call the function



**Types of Python:**

1. **CPython:** Can work with C language
2. **JPython:** Python for Java application
3. **IronPython**
4. **PyPy**
5. **RubyPython**
6. **AnacondaPython**
7. **Stackless (Python for concurrency)**

**Python Versions:**

Python 1.0 introduced in Jan 1994

Python 2.0 introduced in October 2000

Python 3.0 introduced in December 2008 (Recommended to use)

Python 3.0 does not provide backward compatibility

Python will be supported till 2020

**Python 3 is very popular and it is growing like anything**

**Identifiers:**

Name in Python program. (Variable, Method, Class)

Rules to define identifiers in Python:

------------------------------------------------

1. Alphabet symbols (both upper and lower case)
2. Digits (0 to 9)
3. Underscore (\_)
4. Identifier should not start with digit
5. Identifiers are case sensitive
6. Keywords cannot be used for variable purpose.
7. Max length allowed for python identifier: No limit

Identifier starting with “\_” it indicates Private

Starting with 2 underscores “\_\_” it indicates strongly private

Start and end with 2 underscores: Language specific variable defined by python.

**Reserved words:**

33 reserved words

True, False, None,

and, or, not, is,

if, else, elif,

while, for, break, continue, return, in, yield,

try, except, finally, raise, assert,

import, from, as, class, def, pass, global, nonlocal, lambda, del, with

**continue:** Skip current execution

**raise** is equivalent to throw in java

**Note:**

* Only Alphabet symbols
* Except first 3 all remaining contains lower case alphabet symbol.

**To know all the keyword**

Import keyword

keyword.kwlist

**Data Types:**

1. int
2. float
3. complex
4. bool
5. str
6. bytes
7. bytearray
8. range
9. list
10. tuple
11. set
12. frozenset
13. dict
14. None

**Python provides some inbuilt function:**

1. print ()
2. type ()
3. a=10, id(a)🡪 to print object reference

**In Python everything is an object.**

1. **int ():** Integral values 10,20,30,1000000000
2. Decimal form (Base-10,0-9) Ex: 7878
3. Binary form (Base-2,0-1) Ex: 0b1111,0B1111==15
4. Octal form(Base-8,0-7) Ex:0o111==73
5. Hexadecimal (Base-16, 0-9 and a-f or A-F) Ex: 0x

Size of object is not fixed in any language. In Python everything is an Object. So, size/range/maxvalue/minvalue concept is not there in python.

Base Conversions:

bin () ---To convert the value from any base to binary

oct ()—To convert the value from any base octal

hex () =To convert the value from any base to Hex

**Python data type was there is Python 2 but not in Python 3**

1. **Float ()**

For floating type datatype, we can use only decimal value

1. **Complex ():**

a+bj===a is real part and b is imaginary part.

J^2=-1

Real part can be anything but the imaginary part can only be decimal value.

X=10+20J

X.real =10

X.imag =20

1. **bool** === True /False

True is equal to 1

False is equal to 0

True+True ==2

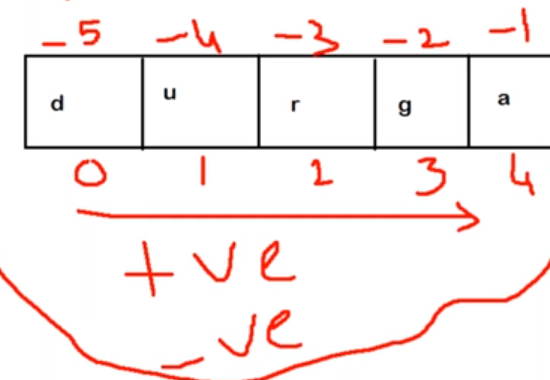
True+False ==1

True/False == ZeroDivisionError

1. **str**

Recommended to use single quote

Triple Single quote or double quote are used to represent string in multiple line



**Slice:**

S[begin:end]

Begin and end are optional

S[begin:end:step]

**Repetition Operator:**

S=’Bishwa’

S\*3 =’BishwaBishwaBishwa’

**Length**:

Len(s)-🡪6

**Python’s fundamental data types:**

int, float, complex, bool, str

There is no Unicode concept in Python as char datatype is not there

**Type Casting or Type coersion:**

int ()

float ()

complex ()

bool ()

str ()

1. **int ():**

int (123.456) ===123

int (True) ==1

int (“10”) ==10

int(“10.6”)== ValueError

We can’t convert complex number to int

ii. **float ()**

float (10) ==10.0

float(10+20j) ==>TypeError

float(True) ==1.0

float(False) ==0.0

float ("10.5") ==10.5

float(“ten”) === ValueError

iii. **complex ()**

1. complex (a) ===a+0j
2. complex (a, b) === a+ bj
3. complex (True) == 1+0j
4. complex (False) ===0j
5. complex ("10") === 10+0j
6. complex ("10.5") ====10.5+0j
7. complex (10,20) ==10+20j
8. complex ("10","20") == TypeError. Complex can’t take second arg if first is a String

iv. **bool ()**

0 means False and others are true

bool (0) == False

bool (10) ==True

bool (-10) == True

bool (10.6) ===True

bool (0+0j) ==False

If both real and imaginary part are 0 then False else it is True

Bool (‘’) == True

If empty then False else it is True

v. **str ():**

**Immutable vs Fundamental Data Type:**

Mutable == Changeable

Immutable == Non- Changeable

**All fundamental data types are immutable**

To print the address of a variable

x=10

Id(x)

X=10

Y=10

X **is** Y === True

Is operator is used for reference check

X=256

Y=256

X is Y===True

X=257

Y=257

X is Y===False

For int reusing the same object is possible from **0 to 256** range. 0-256 because this is range for common use of int.

For **floating** type data type reusing concept is not there.

X=10.0

Y=10.0

X is Y ===False

For **Complex** type data type reusing concept is not there.

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