

1.1 Introduction to Python Programming:

Python is a general purpose interpreted, object oriented, interactive, high level programming language. It was developed by “**GUIDO VAN ROSSUM**” in 1991 at the National Research Institute for Mathematics and Computer Science in Netherlands. Many of the python features are originated from an interpreted language called”ABC”. In order to overcome the limitations in ABC, Python language was developed. Since the developer was the fan of the BBCcomedy show “Monty Pythons Flying Circus”, he named the language as “PYTHON”.

Features of Python:

Easy to learn: Python is a simple programming language with few keywords, simple syntax which is easy to learn.

Interpreted: Python is processed at runtime by the interpreter.

Interactive: We interact with interpreter directly to write our programs.

Object oriented: Python program is built around objects which combine data and functionalities.

High level language: When writing a program, no need to bother about the low level detailssuch as managing memory etc.

Simple: It is a simple language. Reading a Python program feels like reading English.

Portable: Python can run a variety of platforms.

Free and open source: We can freely distribute copy of Python software.

Extendable: We can add low level modules to the Python interpreter easily.

Easy to maintain: Python source code is easy to maintain.

1.2 Python Interpreter and Interactive Mode

Python is an interpreted programming language, because Python programs are executed by the python interpreter. Interpreter takes high level program as input and executes the program. Interpreter processes the source program without translating it into a machine language at a minimum time. It read lines and performs computations alternatively. The diagrammatic representation of Python interpreter mode is given below.

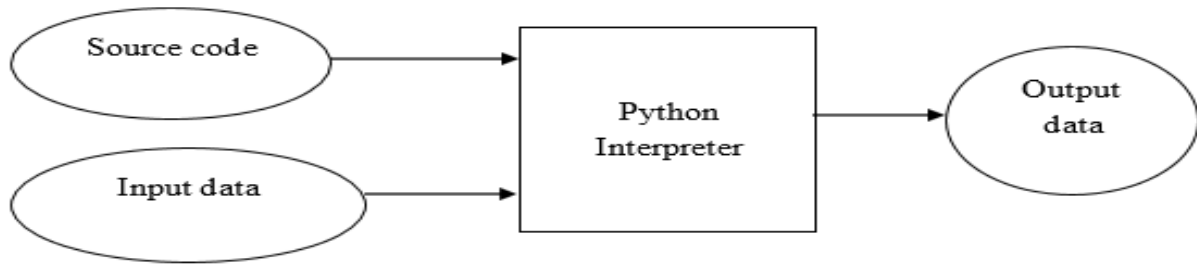


Fig: Interpreter

Compiler:

Compiler reads the entire source program and translates it to machine readable form called object code or executable code. Once a program is compiled, the program can be executed repeatedly without further translations.

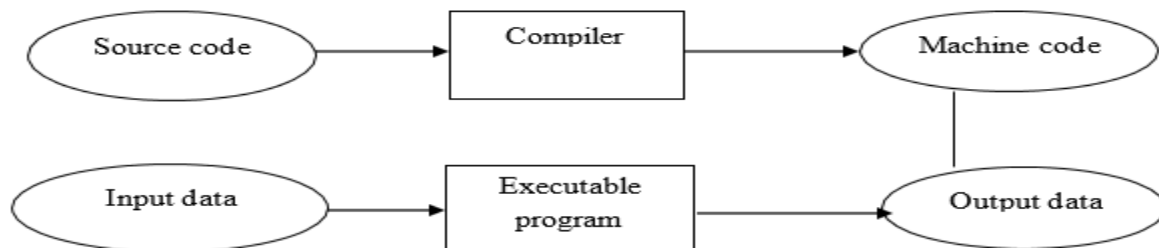


Fig: Compiler

Difference between interpreter and compiler:

Sl.No	Interpreter	Compiler
1	Translate program one statement at a time	Scans the entire program and translates the whole into machine code
2	No intermediate code is generated	Generates intermediate code
3	Execution is slower	Execution is faster
4	It require less memory	It require more memory
5	<i>Example:</i> Python	<i>Example:</i> C,C++

There are two different modes to use the interpreter.

→Interpreter mode (or) Script mode.

→Interactive mode.

Python interpreter mode

Python interpreter mode is a mode, where scripted and finished .py files are run in the python interpreter. The Python file is stored in the extension (.py). Python programs can be executed in the following methods.

(i) Using command line window

(ii) Using python's IDLE

(iii) Directly from command prompt

(i) Using command line window

The following steps are followed to use the command line window.

→Open command line window

→At the >>>prompt, type the following

```
print "HELLO PYTHON"
```

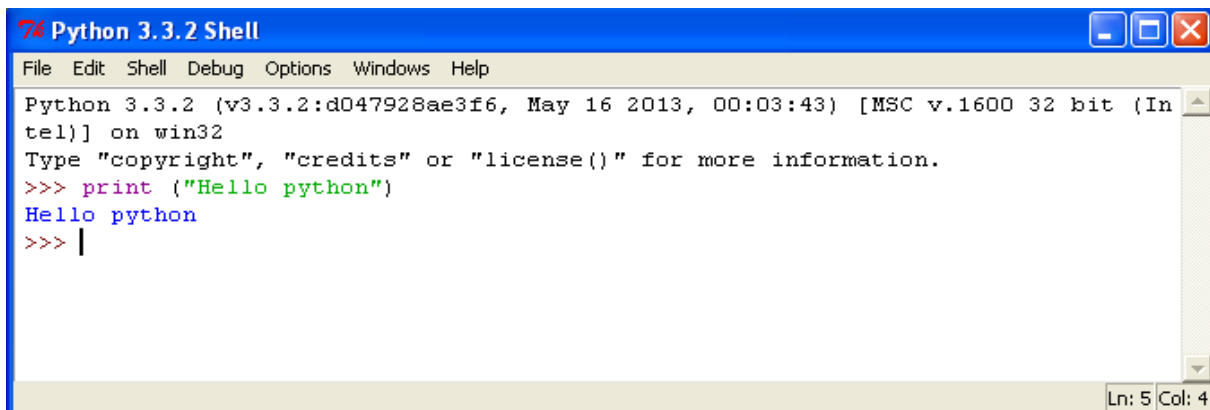
→Press enter

→To exit from python, type the following.

exit.

(ii) Using python's IDLE

IDLE (Integrated Development and Learning Environment) is a tool, which is included in Python's installation package. If we click the IDLE icon, it opens the following python shell window.



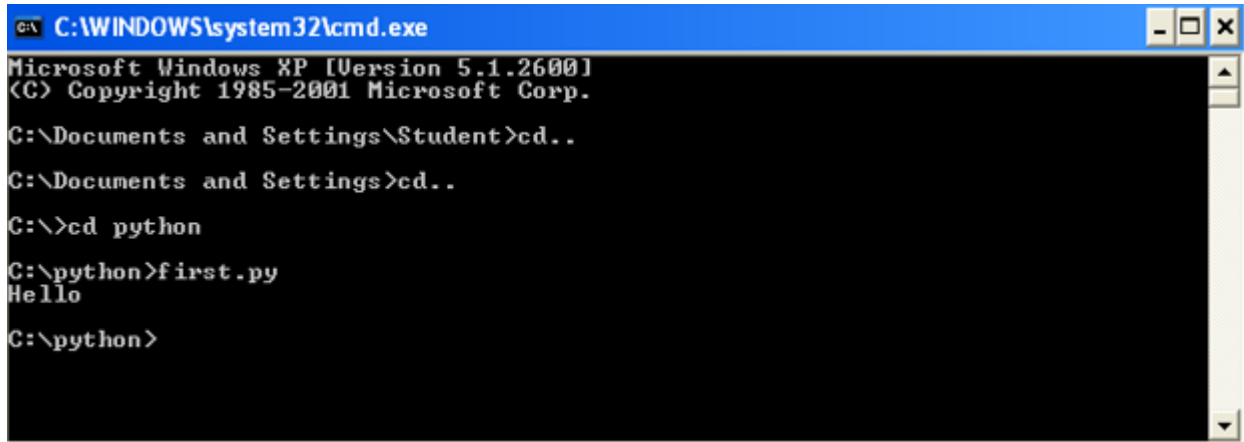
```
Python 3.3.2 Shell
File Edit Shell Debug Options Windows Help
Python 3.3.2 (v3.3.2:d047928ae3f6, May 16 2013, 00:03:43) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print ("Hello python")
Hello python
>>> |
```

(iii) Directly from command prompt

The following steps are followed to use the command prompt.

→Open text editor to write the program.

- Type and save it by filename.py
- Open command prompt, type the name of the program.
- Press enter.



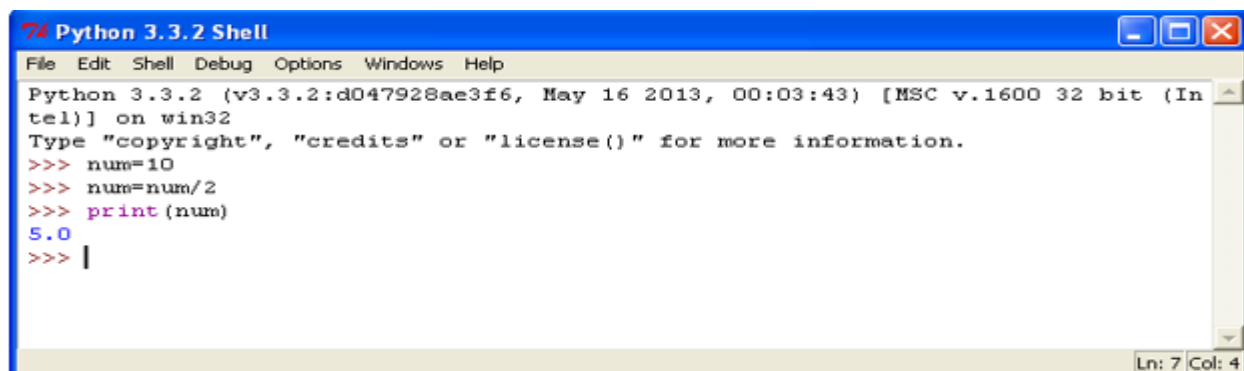
```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Student>cd..
C:\Documents and Settings>cd..
C:\>cd python
C:\python>first.py
Hello
C:\python>
```

Python interactive mode

Python interactive mode is a command line shell which gives immediate feedback for each statement. We interact with Python interpreter to write a program. Here the execution is convenient for smaller programs. In interactive mode, we do the following steps.

- User type the expression.
- Immediately expression is executed.
- Result is printed.



```
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Type "copyright", "credits" or "license()" for more information.
>>> num=10
>>> num=num/2
>>> print(num)
5.0
>>> |
```