PYTHON Run Modes:
In PYTHON Programming run modes are classified into two categories:
1 Interactive Run mode
2 Script Run mode

1 Interactive Run Mode
Python offers a comfortable CLI with the Python Shell, which is also known as the"Python Interactive Shell".

>>> Triple Chevron the Prompt of the PYTHON..!!

Python IDLE : Shell Colors

Syntax	ColorName
Keywords	Orange, Purple
Stdin	Black
StdOut	Blue
Strings	Green
Comments/Errors	Red

Define Statement:
It is type of logical instruction.

Define Command:
It is type of exe file or pre-compiled program

Define Shell:
Collection of commands is called shell

Define DOS Shell (.bat) batch files
Collection of DOS commands is called DOS shell

Define Windows Shell(.wsh)
Collection of Windows commands.

Define Unix Shell? (.sh) Standard Shell
Collection of Unix commands is called Unix shell.

What is a program?
Collection of logical instructions is called program

What is software?
Collection of specilized programs is called software

Types of Softwares
1. Sytem Softwares
2. Application Softwares

1. Sytem Softwares:
It is used control all system components and devices. It is classified into the following two types.
1. Operating System
2. System Utilities

1. Operating System:
It is an interface between user and system. It is classified into the following three types.

1. SUST 2. SUMT 3. MUMT

```
>>> copyright
```
It displays copy-right information of PYTHON

```
>>> credits
```
It displays credits and web info of PYTHON

```
>>> license()
```
It display license info and history of PYTHON, if you want to continue to read hit the key Return (Enter)
if you want to exit 'q' and hit the Return.

print():
It is a function, prints the given object to the standard output device. PYTHON 3.X version onwards..!

Syntax:
```
print(value,sep=' ',end=' ',file=sys.stdout, flush=False)
```

print() Parameters
object/Value(s) - object to be printed.
sep-objects are separated with a notation (Symbol).
end - end is printed at last
file - must be an object with write method.
flush - If True, the stream is forcibly flushed. Default value is False

Example:
```
print("Hello Welcom to PYTHON")
print('Hello Welcom to PYTHON')
print("Hello Welcom to PYTHON")
print('''Hello Welcom to PYTHON''')
print("Hello Welcom to PYTHON")
print("""Hello Welcom to PYTHON""")
```

Example:
```
print("Hello","Welcome",sep="**")
print("Hello","Welcome",sep="__")
```

Example:
```
print("Hello Welcome");print("To PYTHON")
print("Hello Welcome",end="\t");print("To PYTHON")
```

Reading Keyboard Input
Input():
It is used to read data from the keyboard. It reads data into string format.We can convert data into specific format as per the business reqs.

Syntax:
```
input("Message")
```

Reading Single Input Without Request Message:
Example:
```
>>> a=input()
>>> a
```

Reading Single Input With Request Message:
Example:

```
>>> x=input("Enter Any Number: ")
Enter Any Number: 1
>>> x
'1'
>>> y=input("Enter Any Number: ")
Enter Any Number: 2
>>> y
'2'
>>> x+y
'12'
>>>
```

Reading Multiple Inputs:
Example:

```
>>> x=input().split()
10 20 30
>>> x
['10', '20', '30']
```

PYTHON help() function:
It displays the documentation string. It is used to see the help related to modules, keywords, attributes, etc.

Example:

```
>>> help(print)
>>> help(input)
>>> help()
help> print
help> input
help> quit
>>>
```

Configure IDLE:
Open a configuration dialog and change preferences for the following: fonts, indentation, keybindings, text color themes, startup windows and size, additional help sources, and extensions.

Components in Configure Dialog:
Configure dialog has the following list of components:
1. Fonts/Tabs ==> To change the fonts and size
2. Hightlighting
3. Keys ==> To Define customized keys
4. General
5. Extensions

How to Quit the Python Shell:
It's easy to end the interactive session: You can either use quit(), exit()

Define PSF? (Python Software Foundation)
It is an organization devoted to advancing open source technology related to the Python.
1 PEPs ==>Python Enhancement Proposals
2 PyPI ==>Python Package Index

Python Implementation Alternatives/Flavors
1. CPython (Python for C)
2. Jython(Python for Java)
3. IronPython(Python for .NET)
4. PyPy(Python for speed)
5. MicroPYTHON (for Micro Processors)
6. PyDoop, PySpark (for Big Data Frameworks)
7. Brython (Replace Javascript with Python)
8. RubyPython (Python and Ruby)
9. Winpython (Python distribution for Windows)
10. PyObjC(Python and Objective-C)
11. AnacondaPython(Handling Huge Volume of Data Processing)
12. VPython is the Python programming language plus a 3D graphics module called Visual & Animations
13 IPython is a command shell for interactive computing in multiple programming languages.
14. RPython is a framework for implementing interpreters and virtual machines for programming languages, especially dynamic languages.

Best Books in Python for Freshers & Professionals:
1 Python Crash Course: by Eric Matthes(2e)
2 Think Python: by Allen Downey(2e)
3 Python Cookbook:by David & Brian (3e)
4. Core Python Programming: By Dr. R.Nageswara Rao(2e)
5. Introduction to Computation and Programming Using Python:by John V. Guttag(2e)

NOTE:
As per Guido van Rossum words An individual who can speak Python is known as a "Pythonista". A group is called "Pythonistas".

Ninja Developer are having polyglot programming talent..!!
Fullstack Programmer==> Django Developer/ Programmer

https://nerdlettering.com/ (mugs, t-shirts, mouse pads, and stickers)
Online console from PythonAnywhere
https://www.python.org/shell/
https://www.pythonanywhere.com
Mobile App ==> Dcoder

Quotation in Python:
Python accepts single ('), double (") and triple (''' or """) quotes to denote string literals, as long as the same type of quote starts and ends the string.

Multi-Line Statements
When you want to write a long code in a single line you can break the logical line in two or more physical lines using backslash character(\).

NOTE:
Statements contained within the [], {}, or () brackets do not need to use the line continuation character.

Single Lone Underscore (_):
The most recent computed/calculated or displayed output value is

automatically stored by the interpreter in a special variable with the name "_".

Python Path Testing
```
>>> import os
>>> os.getcwd()
'C:\\Users\\admin\\AppData\\Local\\Programs\\Python\\Python38-32'
```

NOTE:
\\ ==> Better data readability in Windows Environment..!!

Python Keywords:
1. Keywords are the reserved words
2. We can not use a keyword as any Identifier/Variable
3. In Python keywords are case sensitive(Not only lower case)
4. There are 35+ keywords in Python
5. All keywords except True, False & None are in lower case.

```
>>> import keyword
>>>print(keyword.kwlist)
['False', 'None', 'True', 'and', 'as', 'assert', 'async', 'await',
'break', 'class', 'continue', 'def', 'del', 'elif', 'else', 'except',
'finally', 'for', 'from', 'global', 'if', 'import', 'in', 'is',
'lambda', 'nonlocal', 'not', 'or', 'pass', 'raise', 'return', 'try',
'while', 'with', 'yield']
```

Display the Current Platform Name
```
>>> import sys
>>> print(sys.platform)
>>> print(sys.path)
>>> print (sys.version)
>>> import platform
>>> platform.python_version()
>>> import this
  The Zen of Python, by Tim Peters
```

Python vs JAVA
Java (1995) James Gosling
1 Statically Typed, All variable types must be Explicitly declared.
2 Lengthy and Less Compact Code, Typing Static, strong, safe
3 Uses braces for structuring code
4. Faster but Complex Syntax
5. Lesser programmer productivity
6. No perfect libraries for ML, DL, AI, NLP and IoT

Example:JavaCode:
```
public class HelloWorld
{
   public static void main (String[] args)
   {
      System.out.println("Hello, World!");
   }
}
```

Example:
```
public class HelloWorld
{
```

```
   public static void main (String[] args)
   {
     for(int i=1;i<=10;i++)
     {
      System.out.println("Hello, World!");
      }
   }
}
```

Python (Dec,1989)-Guido Van Rossum-Amoeba-OS
1 Dynamically Typed, No need to declare any data type
2. Smaller and Compact Code, Duck Typing , dynamic, strong
3. Uses Indentation for structuring code
4. Faster to learn, Easy Syntax
5. Higher programmer productivity
6. Extensive libraries for ML, DL, AI, NLP and IoT

Example:

```
print("Hello, World!")
```

Example:

```
print("Hello, World"*10)
```

Comments in PYTHON:
Comments in Python are used to improve the readability of the code. Comments are non executable statements or ignore statements. Using these comments we can declare user defined or customized statements in the source code. Python supports two types of comments.
1 Single lined comment.
2 Multi lined Comment.

1 Single lined comment. (In Line Comments)
In Python, we use the pound (#) symbol to start writing a comment. If developer want to only specify one line comment than use single line comment, then comment must start with #

```
>>> #This is single line comment. (pound)
>>> #print("Hello")
>>> #print("Welcome to PYTHON Programming")
```

Multi-line comments
If we have comments that extend multiple lines, one way of doing it is to use pound (#) in the beginning of each line.

```
>>> #This is a long comment and it extends to multiple lines, This is
a long comment and it extends to multiple lines.
```

Eample: As per RealTime Project(s) UseCase:

```
>>> #NameOfTheProject: BFSI
>>> #NameOfTheTask:GenerateWeeklyReports
>>> #TaskAssignedBy:TeamLead
>>> #TaskReviewedBy:TeamManager/TeamLead
>>> #ApproxTaskFinishedDate:01/11/2020
>>> #CommentsOnTask:
>>> #FeedBackFromClient:
```

PYTHON SHELL PROGRAMMING:

ScriptRunMode/Dev. Mode
You can store code in a file and use the interpreter to execute the contents of the file, which is called a script. Python scripts have names that end with .py Extension.

Example:
1. Goto IDLE, Select File and click on New or Ctrl+N (to Open New Window)
2. Enter required python statements or commands

```
print("Welcome to Script MODE")
print('Welcome to Dev MODE')
print("""It is a PYTHON Shelll""")
print('''Good Bye...!!''')
print(12345)
```

3. Save with .py Extension @ desired location
4. Hit the key F5 or Goto run menu click Run
5. The out put displayed in readonly format on the IDLE
6. Do required modifications in the saved file and re-run..!!

PYTHON File Other Extensions:
.py ==> Python File (Regular Scripts)
.py3 ==> (rarely used) Python3 script
.pyc==> This is the compiled bytecode/compiled scripts(Bytecode)
.pyd ==> This is basically a windows dll file
.pyo ==> This is optimized pyc file
.pyw==Python script for Windows
.pyz ==> Python script archive (Compressed or Zip formated)