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)

SETTING PYTHON PATH IN Windows:
Right click on My Computer ==>Properties ==> Advanced System Settings ==>Environment Variable ==>NewIn Variable name write path and in Variable value.

```
>>> import os
>>> os.getcwd()
```

Displays PYTHON Installed Path, copy path without quotes ==> Click Ok ==>Ok.

Clear screen in Windows:
There is no python builtin command for IDLE to clear the screen in Windows platform. We can perform through customized or userdefined commands..!!

```
>>> print("\n"*20)#displaying blank lines
>>> clear="\n"*20#Assign blank lines
>>> print(clear)#displaying blank lines
```

INSIDE PYTHON
After successful installation of Python, It is the combination of Interpreter and Support Library.

Programmers View of Interpreter
Interpreter is a software, which takes source code, reads it line by line and executes it line by line to produce the output.

Inside INTERPRETER
In Compiled languages are, compiler converts the source code into machine code or binary code, which is directly executed by the machine. In PYTHON compiler is using to convert the source code(.py) into byte code.(.pyc)

What is Byte Code in PYTHON?
Byte code is easily readable by PYTHON Virtual Machine and Source code easily understandable by programmers.
1 Low Level
2 Platform Independent
3 Efficient
4 Intermediate
5 Representation of your source code

PVM is read the byte code line by line and execute every line and produce output. In that process PVM uses all your Library Modules.

What are PYC files?
Python automatically compiles your script to compiled code, so called byte code, before running it.
__pycache__:
It is a folder containing Python-3 byte-code compiled and ready to be executed.

Example:
```
import py_compile
print(dir(py_compile))
```

Example:
```
import compileall
print(dir(compileall))
```

Example:
```
import py_compile
py_compile.compile("MyScript.py")
```

Steps to Work with PYTHON INSIDE:
1. Create a Folder/Directory on the Desktop (or in AnyLocation)
2. Create a py file in that folder
3. Go to command prompt, change to current Folder/Dir location
4. python and hit the return key
5. import py_compile
6.py_compile.compile("filename.py")
7. __pycache__ folder created automatically with byte code
8. cd __pycache__
9. python file.cpython-38.pyc, to execute byte code directly without source code

PYTHON RealTime IDEs
Define IDE?
Integrated Development Environment is a software application, that provides comprehensive facilities to computer programmers for software development.

What is PyCharm?

It is the best IDE for realtime PYTHON projects. It provides code analysis, a graphical debugger, an integrated unit tester and supports web development with Django framework.

PyCharm Come in two editions:
1 Community Edition (Fully-Free)
2 Professional Edition (Commercial-$199)

PyCharm IDE Installation:
1 Go to https://www.jetbrains.com/pycharm/download
OR
2 https://www.jetbrains.com/pycharm/promo/anaconda/
3 Install any Edition Community or Professional
4 It is cross-platform and works on Windows, macOS, and Linux.

PyCharm IDE Features List:
1 Intelligent Coding Assistance
2 Built-in Developer Tools
3 Web Development
4 Scientific Tools

Components of Pycharm:
It has maily the following Components:
1. Menu or Dashboard
2. Project Panel
3. Code Editor
4. Console or Output Window

How to create a project:
1. Goto file menu, click on New project, Enter name of the Project PYTHON_6AM
2. Select Current window
3. Right click on the project select Python file, enter name of the file.
4. Enter required python source code as follows

Example:
```
print("Hello Welcome to PYCHARM")
x=input("Enter any Number: ")
print(x)
import os
print(os.getcwd())
import sys
print(sys.platform)
print(sys.path)
import platform
print(platform.python_version())
import  keyword
print(keyword.kwlist)
```

To run the code Ctrl+Shift+F10

Debugging in PYCHARM:
It is the process of identifying and fixing problems in Code. The following short-cut keys are required to debug..!!

1 Step Over (F8)

2 Step Into (F7)
3 Force Step Into (Alt+Shift+F7)
4 Step Out (Shift+F8)
5 Run to Cursor (Alt+F9)

Example:

```
a=int(input("Enter Any Number: "))
b=int(input("Enter Any Number: "))
c=a+b
print("The Result is: ",c)
d=a-b
print("The Result is: ",d)
e=a*b
print("The Result is: ",e)
f=a/b
print("The Result is: ",f)
```

Tabnine for PyCharm (Fast, Effective & Accurate)
Tabnine is the world's leading AI code completion tool. It is powerful Artificial Intelligence assistant works right in your IDE, for easy, interruption-free coding. Tabnine supports over 30 languages.

Resoruces:
https://www.tabnine.com/

What is Anaconda?
The Most Popular Python Data Science Platform.
It is a freemium open source distribution of the Python and R PLs for large-scale data processing, predictive analytics and scientific computing.

How to Install Anaconda?
1. https://www.anaconda.com/download/
2. Click on Python 3.7 version 64-Bit Installer download
3. After successful Installation of Anaconda Platform
4. Go to MSDOS Command Prompt type spyder or jupyter notebook
5. SPYDER(Scientific PYthon Development EnviRonment)
6. JUPYteR (formerly==>iPython(JUlia, PYthon and R)

Coding Environments
Anaconda comes with two popular IDEs :

Spyder:
It is a powerful IDE for the Python language with advanced editing, interactive testing, debugging features..!!

Main Components in Spyder.
1 Dashboard 2 Project Explorer
3 Editor 4 Console 5 Help

What is Anaconda Navigator?
It is a desktop GUI, that allows you to launch applications and easily manage conda packages without using command-line commands.

Jupyter Notebook:(http://jupyter.org/)
Formerly known as the IPython Notebook. It is a server-client application that allows editing and running notebook documents via a

web browser.

Features of Jupyter Notebook:
1 Edit/Run code in the browser
2 It supports 40+ Programming Languages
3 Share notebooks: using email, Dropbox, GitHub
4 BigData Integration

Define Conda?
It is an open source package management system and environment management system for installing multiple versions of software packages.

Goto Ancondata Prompt and do the follwing:
$conda update conda
$conda install numpy
$conda help
$conda help config
$conda help info

What is pip
It is a package manager for Python programming language.

Installation
$python get-pip.py
$pip install pip

Syntax:
pip list [options]

Upgrading pip: UNIX:
$pip install -U pip

pip Commands:
$pip list $pip help $pip help install
$pip search django $pip install pympler
$pip uninstall django $pip show django
$pip download django $pip install virtualenv
https://pip.pypa.io/en/stable/reference/

What is Colaboratory?
Colaboratory, or "Colab" for short, allows you to write and execute Python in your browser, with Zero configuration required, Free access to GPUs, Easy sharing Whether you're a student, a data scientist or an AI researcher, Colab can make your work easier.

GoogleColab:
It is a free Jupyter notebook environment that runs entirely in the cloud. It Colab support many popular machine learning libraries which can be easily loaded in your notebook.
https://colab.research.google.com/

Some basic commands in GoogleCoLab:
1. !cat /proc/cpuinfo
2. !cat /proc/meminfo
3 !pip install pandas
4. import pandas as pd

```
5. df = pd.read_csv('/content/BostonHousing.csv')
6. df.head()
etc..............!!
```