HEXAVARSITY
Enhancing Excellence

Python Programming

Course Objective

Day wise	*Name of Topic	*Duration	
		*Hours	*Minutes
Day 1	• Python and its Feature • History of the Python • Writing and Running First program • Keywords & Identifiers • Variables & Operators • Data Types 1.Numeric 2.Sequence 3.Boolean 4. apping	08	00
Day 2	• Control Structure 1. If statement 2. If-else statement 3. If-elif-else statement 4. For Loop 5. While Loop 6. Break, Continue & Pass • Input and Output • String Function • Number Function • Date and Time Function	08	00

Course Objective Contd…

Day 3	• Python Functions • Python Modules • OOPS 1. Class and Object a. Constructor b. Access Specifiers 2. Inheritance 3. Polymorphism • Class and Static Methods • Variable Types & Scope	08	00
Day 4	Exception Handling File Handling	08	00
Day 5	Database Access Database DML operations Python Specific packages	08	00

Session Objective

To understand the basic concepts of Python,

- Python and its Feature
- History of the Python
- Writing and Running First program
- Keywords & Identifiers
- Variables & Operators
- Data Types
    - Numeric
    - Sequence
    - Boolean
    - Mapping

Python Features

What is Python?

- **Python** is an interpreted, interactive, object-oriented language.
- It supports the use of modules and packages
- It is extremely used in the field of Rapid Application Development

Why to learn Python?

Interpreted :

Python is processed at runtime by the interpreter.
Python codes need not be compiled before execution.
This is like PERL and PHP.

Interactive :

Python prompt can interact with the interpreter directly to write programs.

Object-Oriented :

Python supports Object-Oriented technique of programming that encapsulates code within objects.

Beginner's Language :

Python supports the development of a wide range of applications from simple text processing to browsers to games.

Why to learn Python? Contd…

Standard library :

Python’s library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.

GUI Programming :

Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.

Scalable :

Python provides a better structure and support for large programs than shell scripting.

Why to learn Python? Contd…

Portable :

Python can run on a wide variety of hardware platforms and has the same interface on all platforms.

Extendable :

Low-level modules can be added to the Python interpreter.
These modules enable programmers to add to or customize their tools to be more efficient.

Databases :

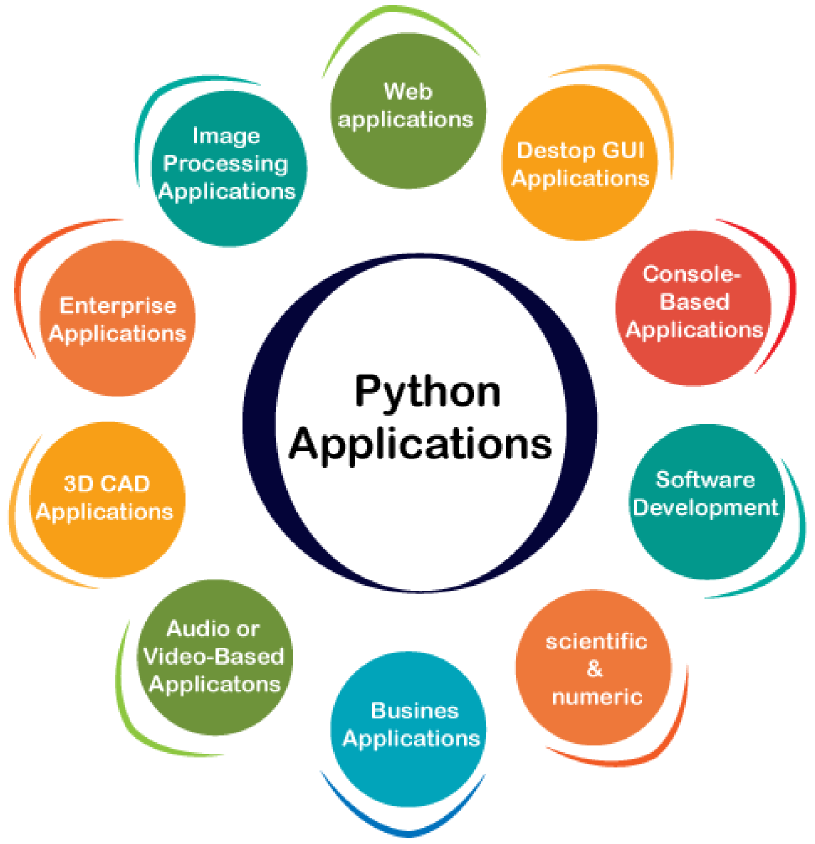
Python provides interfaces to all major commercial databases.

History of Python

- Python was developed by **Guido van Rossum** in 1980
- Python is derived from ABC, Modula-3, C, C++, Algol-68, Smalltalk, and Unix shell and other scripting languages.

Python Version	Features
Python 1.0	Lambda, map, filter, and reduce.
Python 2.0	List comprehensions, garbage collection systems.
Python 3.0 - "Py3K"	Designed to rectify the fundamental flaw of the language.

Python Applications



Famous Companies that uses PYTHON

Quora
Spotify
NASA
YouTube
Google
edX
YAHOO!
Dropbox
yelp
reddit
DISQUS
IBM
Pinterest
Instagram
Eventbrite
UBER

Python First Application

Editors and IDE

General Editors and IDEs with Python Support

- ✓ Eclipse + PyDev
- ✓ Sublime Text
- ✓ Atom
- ✓ GNU Emacs
- ✓ Vi / Vim
- ✓ Visual Studio
- ✓ Visual Studio Code

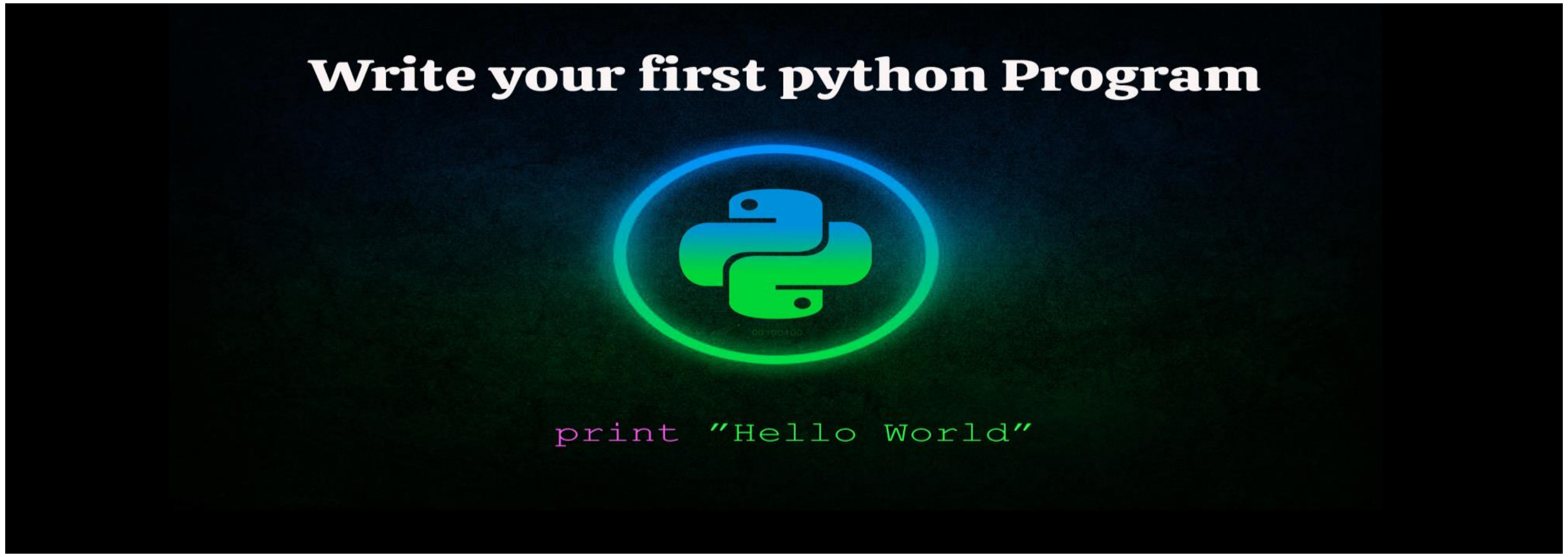
Python-Specific Editors and IDEs

- ➢ PyCharm
- ➢ Spyder
- ➢ Thonny

First Python Program

Python provides different ways to run a program:

- Using Interactive interpreter prompt
- Using a script file
- Using IDE

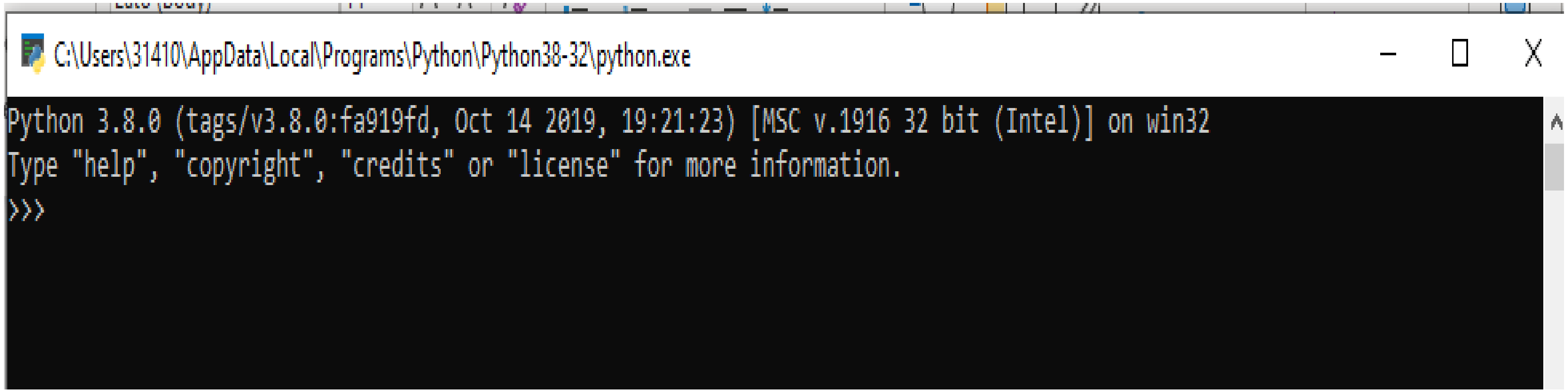


First Python Program Contd...

Interactive Mode:

- To open in interactive mode, open the terminal (or command prompt),

STEP1:



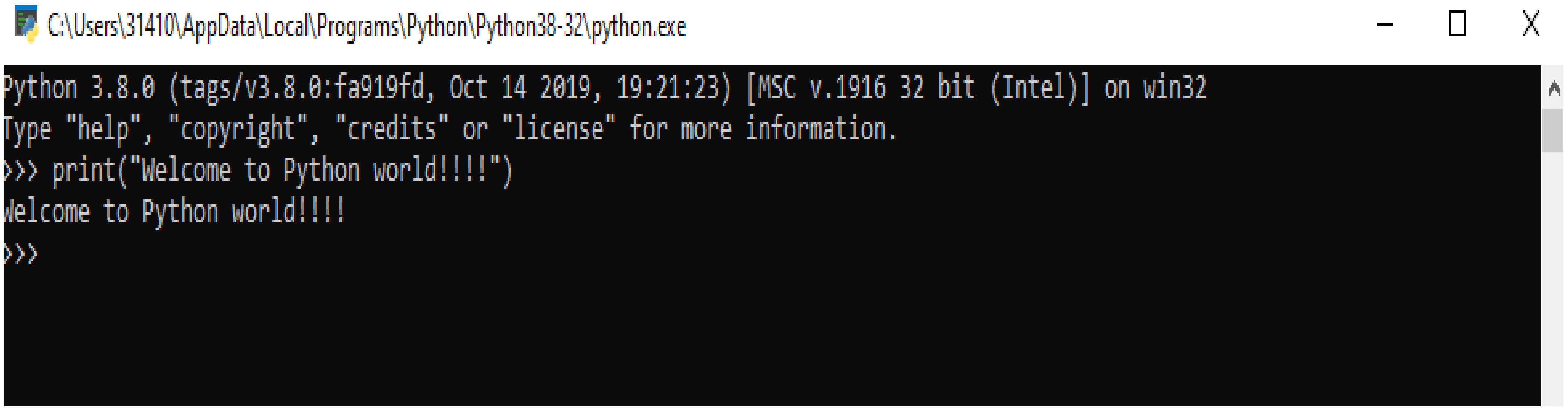
C:\Users\31410\AppData\Local\Programs\Python\Python38-32\python.exe

```
Python 3.8.0 (tags/v3.8.0:fa919fd, Oct 14 2019, 19:21:23) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

First Python Program Contd...

STEP 2:

Write the Python code for execution,


C:\Users\31410\AppData\Local\Programs\Python\Python38-32\python.exe

```
Python 3.8.0 (tags/v3.8.0:fa919fd, Oct 14 2019, 19:21:23) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Welcome to Python world!!!!")
Welcome to Python world!!!!
>>>
```

First Python Program Contd…

Script file:

- ✓ Interpreter prompt is good to run the individual statements of the code.
- ✓ To execute block of statements, write the code into a file which can be executed later.
- ✓ Open an editor like notepad, create a file named Welcome.py (Python used .py extension) and write the following code in it.

STEP 1:

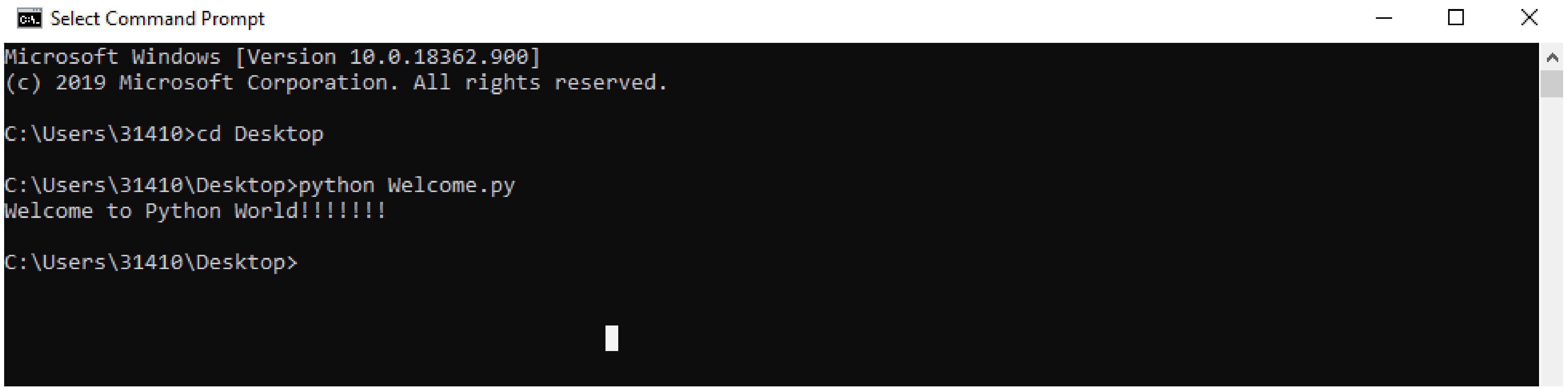
Create a file “Welcome.py”

STEP 2:

Enter the following code
Print(“Welcome to Python World!!!!!!!!!!”)

First Python Program Contd…

STEP 3:
Run the following command on the terminal.
python Welcome.py



Select Command Prompt

```
Microsoft Windows [Version 10.0.18362.900]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\31410>cd Desktop

C:\Users\31410\Desktop>python Welcome.py
Welcome to Python World!!!!!!!

C:\Users\31410\Desktop>
```

First Python Program Contd…

PyCharm IDE

PyCharm is specially used for Python language. It is used for intelligent code completion, on-the-fly error checking and quick-fixes, easy project navigation, and much more.

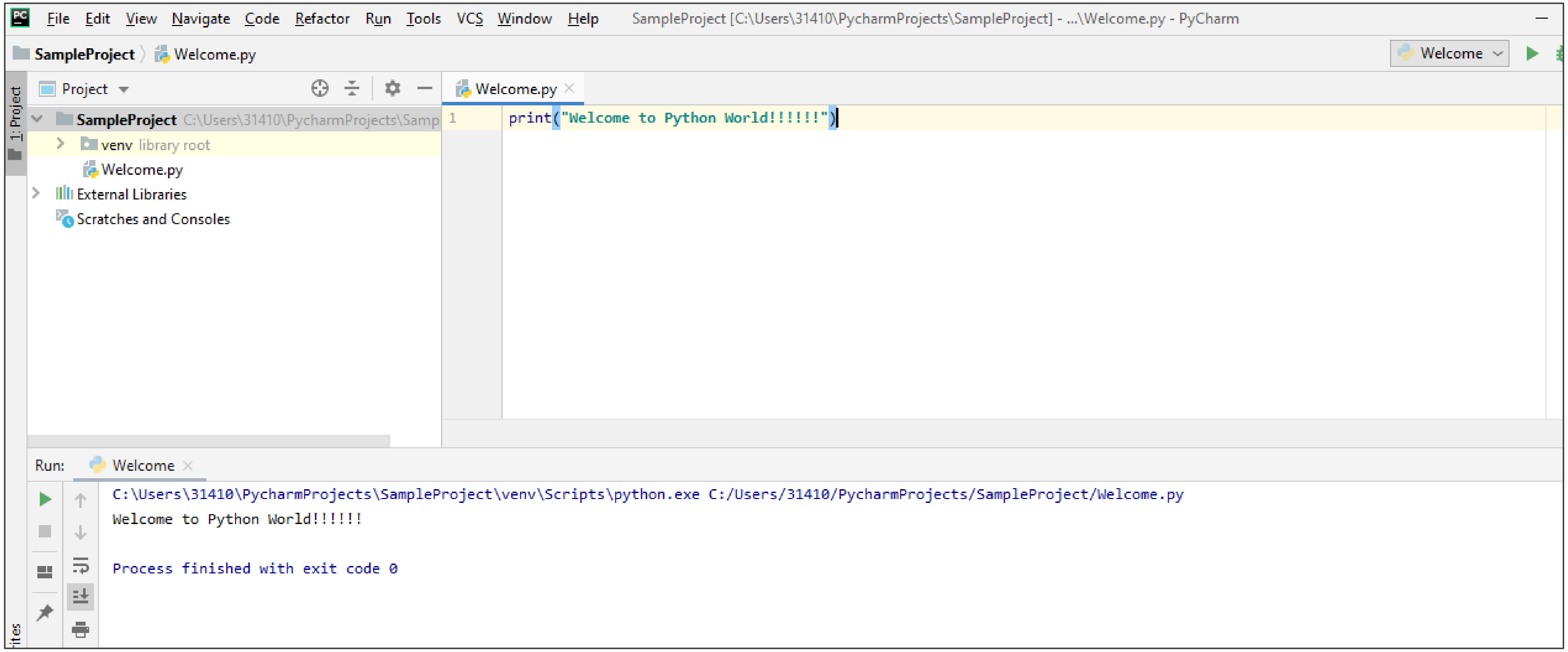
STEP 1:
File -> New Project->(Enter the project name) -> click Create button

STEP 2:
Right click the Project -> New-> Python file->(Enter the name of the file)

STEP 3:
Enter the Code in the workspace

STEP 4:
To Execute the code
Run-> Run'Welcome'

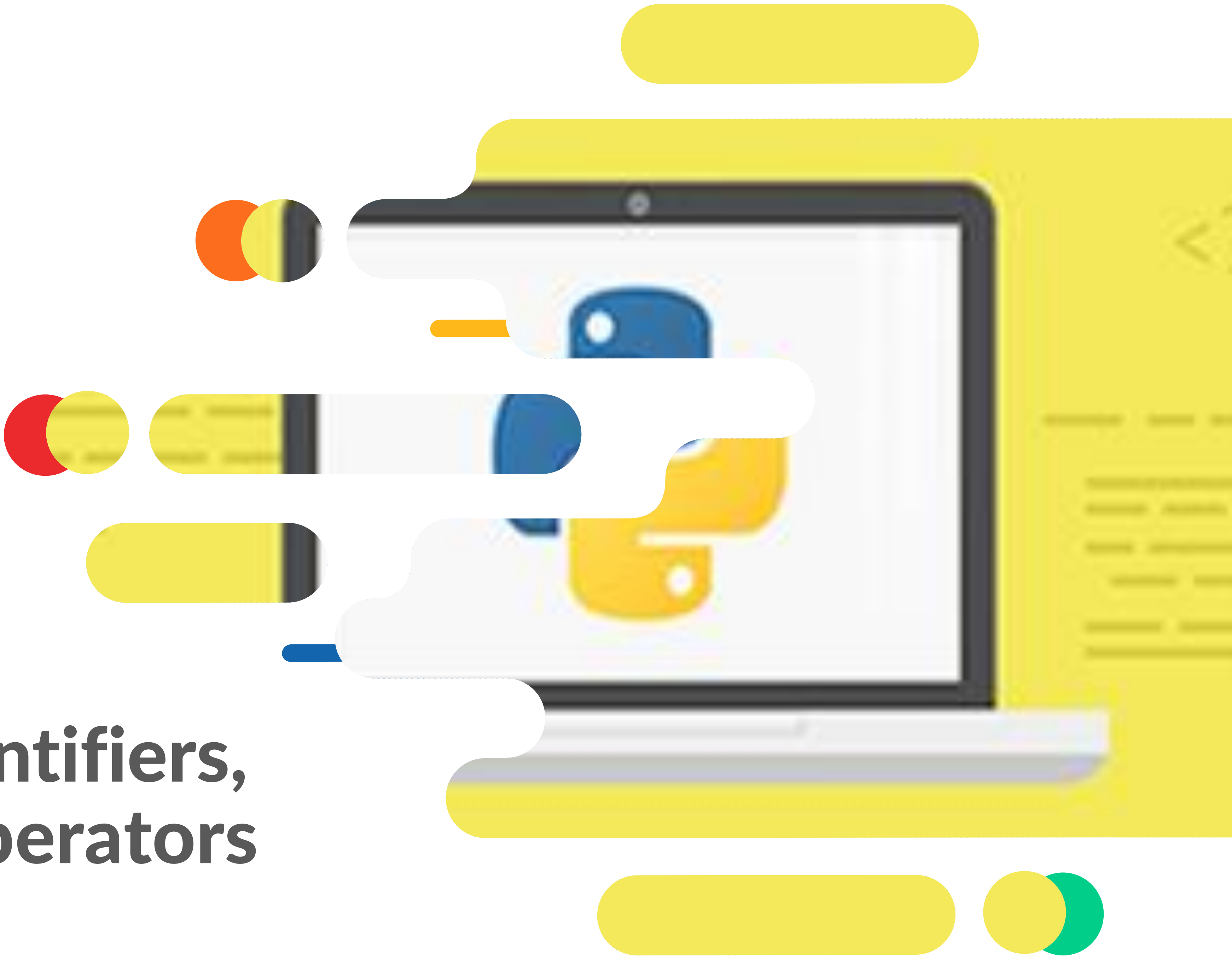
First Python Program Contd…


File Edit View Navigate Code Refactor Run Tools VCS Window Help
SampleProject [C:\Users\31410\PycharmProjects\SampleProject] - ...\Welcome.py - PyCharm
SampleProject
Welcome.py
Welcome
Project
SampleProject C:\Users\31410\PycharmProjects\Samp
venv library root
Welcome.py
External Libraries
Scratches and Consoles
1: Project
Run:
Welcome

```
print("Welcome to Python World!!!!!!")
```

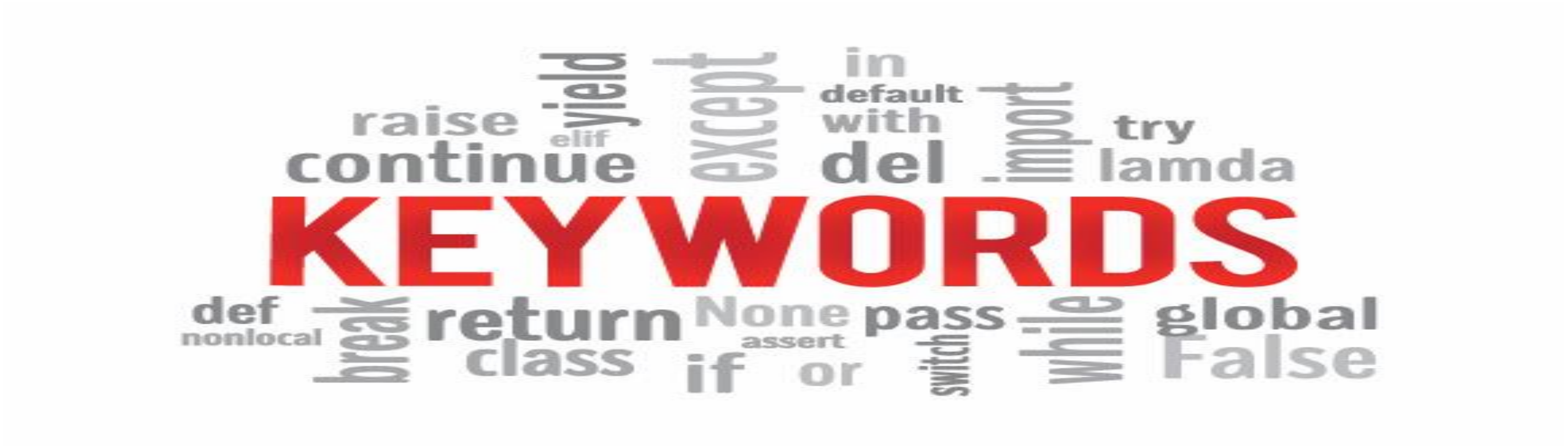
```
C:\Users\31410\PycharmProjects\SampleProject\venv\Scripts\python.exe C:/Users/31410/PycharmProjects/SampleProject/Welcome.py
Welcome to Python World!!!!!!

Process finished with exit code 0
```

Keywords, Identifiers, Variables & Operators



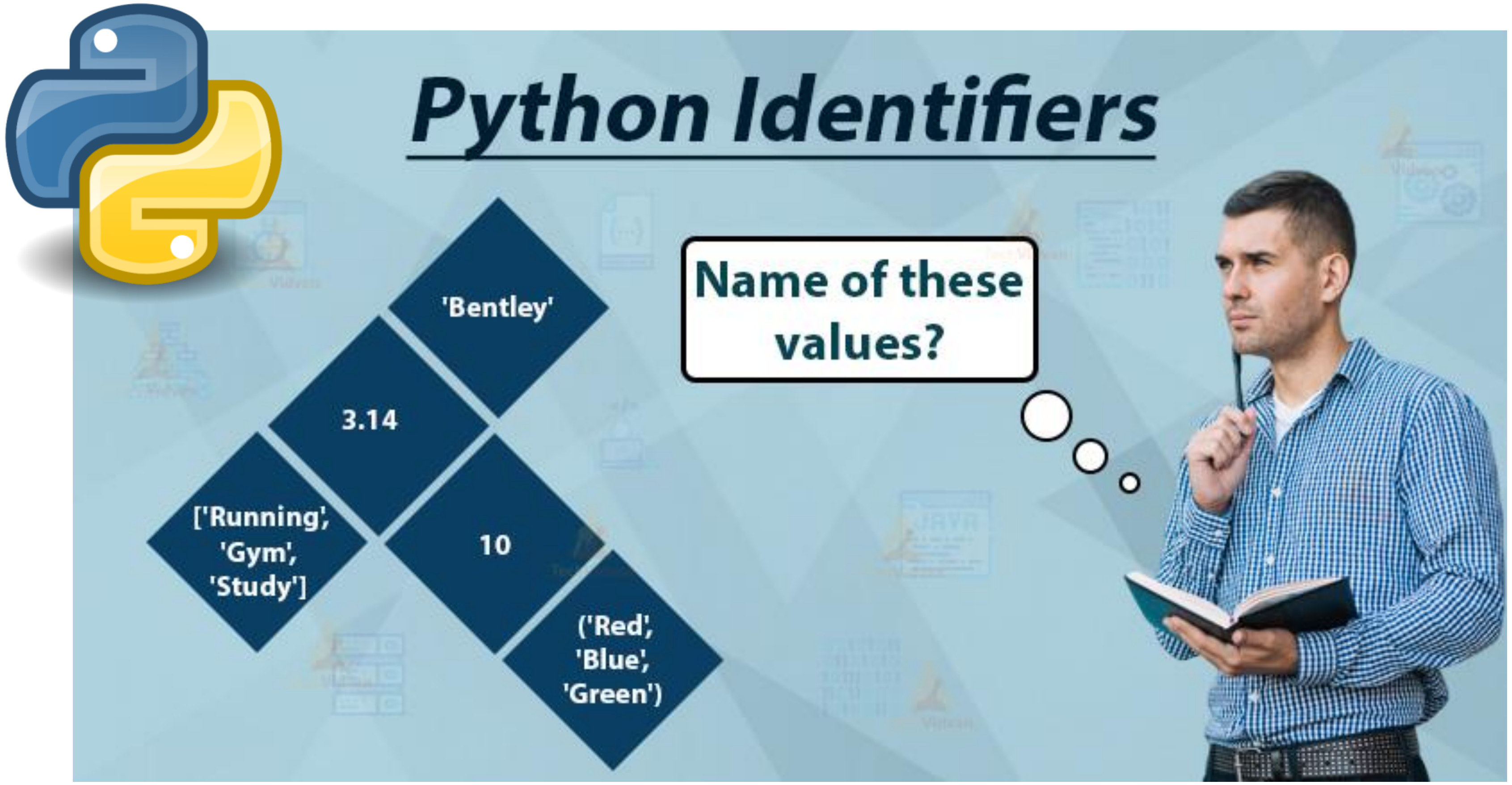
Keywords in Python

- Each keyword has a special meaning and a specific operation.
- These keywords can't be used as a variable.
- Python Keywords are special reserved words that gives special meaning to the compiler/interpreter.



Identifiers in Python

- An identifier is a name given to an entity.



Identifiers in Python Contd…

Best Practices for Python Identifiers

- Class names should start with a capital letter and all the other identifiers should start with a lowercase letter.
- Begin private identifiers with an underscore (_).
- Use double underscores (__) around the names of magic methods and don't use them anywhere else. Python built-in magic methods already use this notation.
  For example: __init__, __len__.

Identifiers in Python Contd…

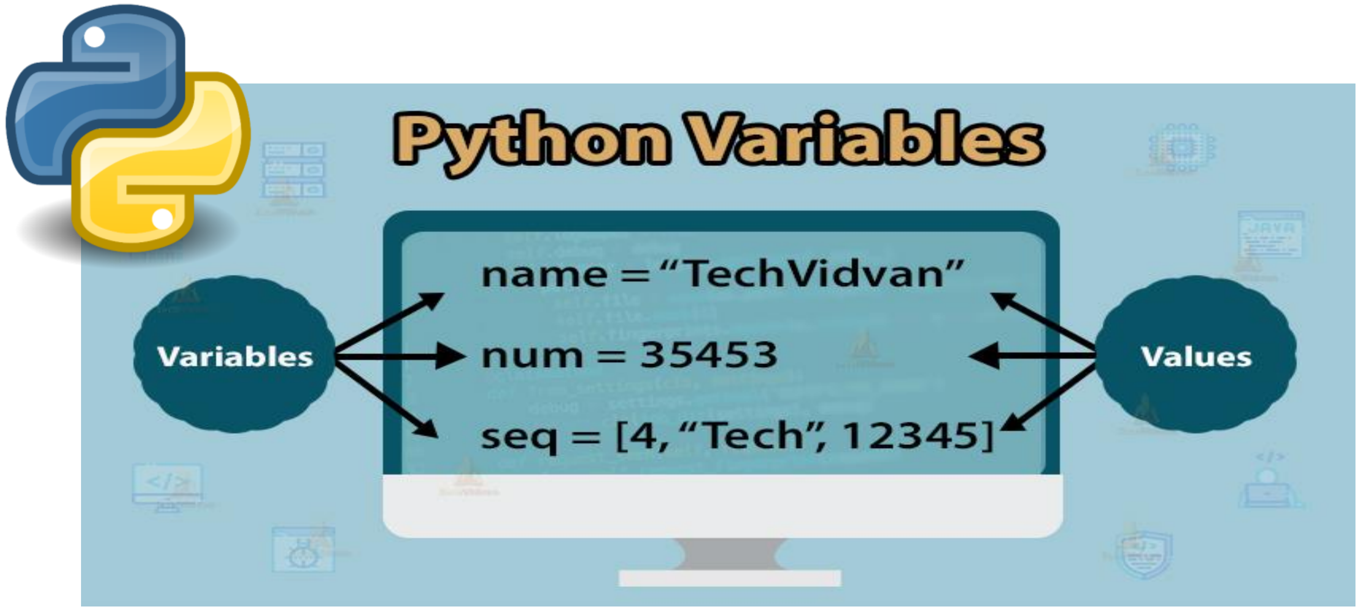
- Always prefer using names longer than one character. index=1 is better than i=1

- To combine words in an identifier, you should use underscore(_).
  For example: get_user_details.

- Use camel case for naming the variables.
  For example: fullName, getAddress, testModeOn, etc.

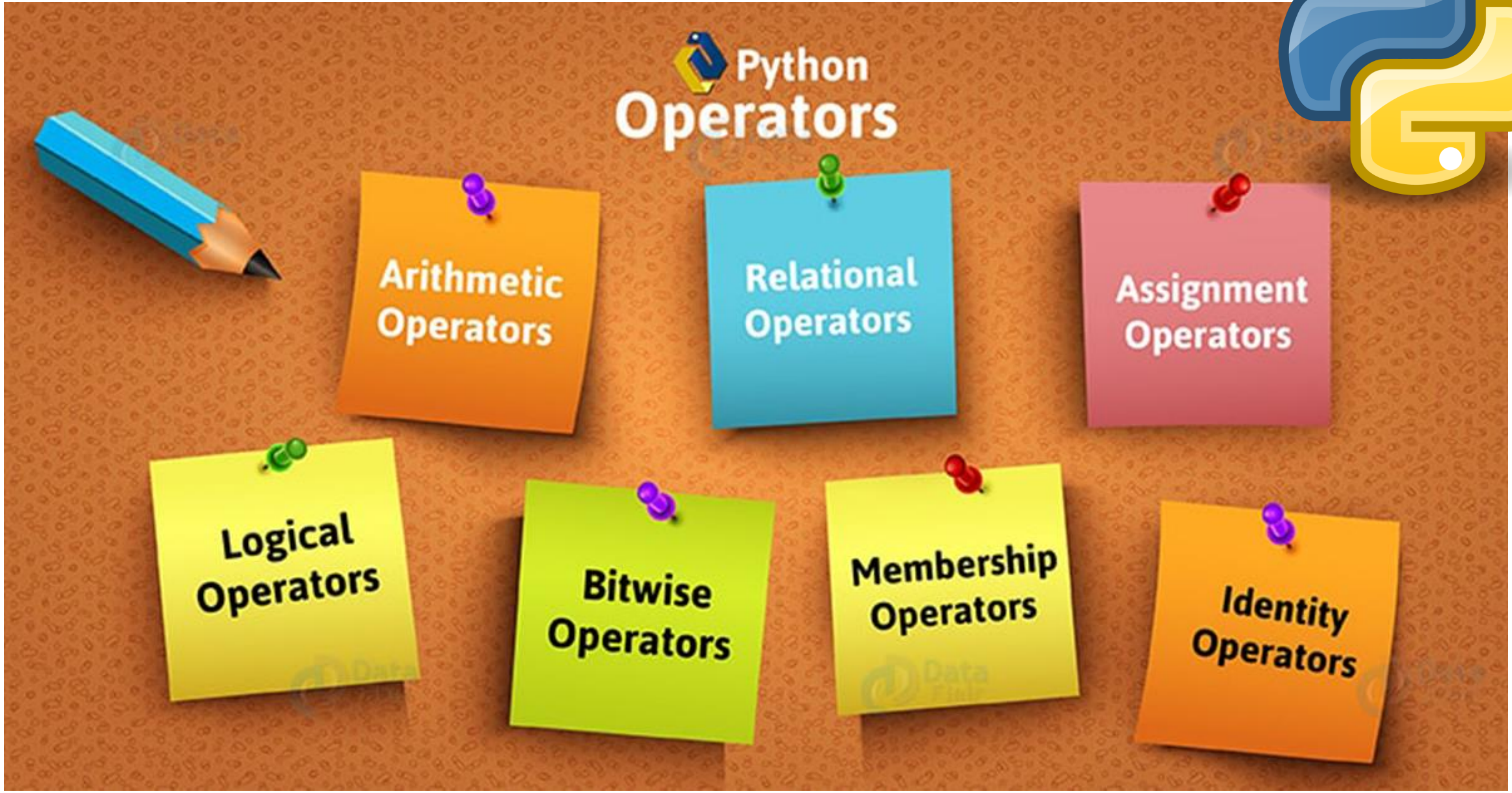
Python Variables

- ❖ Python variables are containers for storing data values
- ❖ Python is Dynamically-Typed
- ❖ Data type is not required for variable declaration. This is decided by the interpreter at runtime.



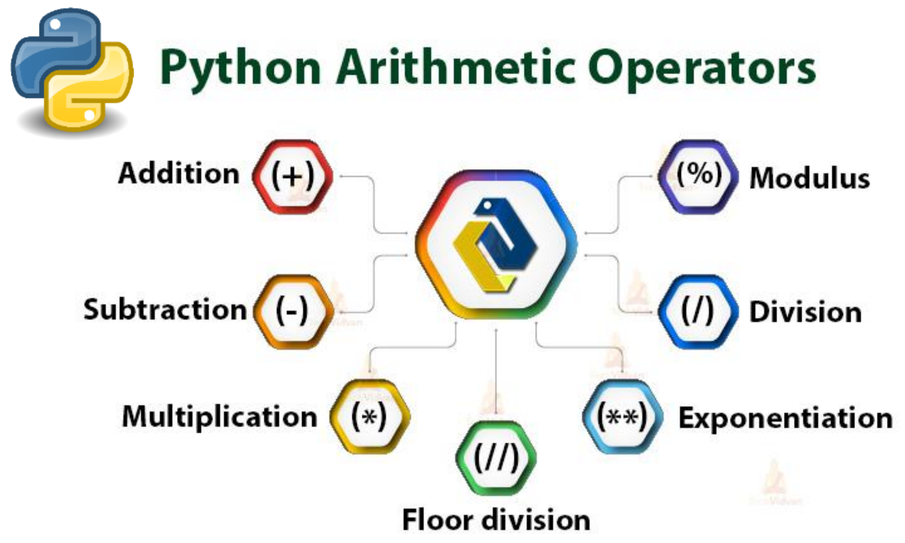
```
name = "TechVidvan"
num = 35453
seq = [4, "Tech", 12345]
```

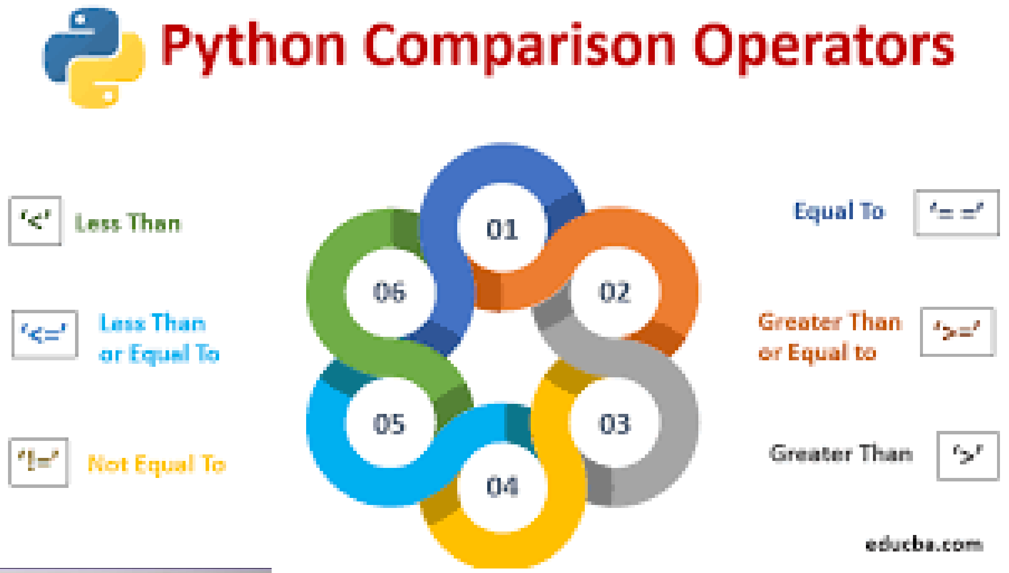
Operators in Python



Operators in Python

Contd...




Python Comparison Operators
'<' Less Than
'<=' Less Than or Equal To
'!=' Not Equal To
01
02
03
04
05
06
Equal To '= ='
Greater Than or Equal to '>='
Greater Than '>'
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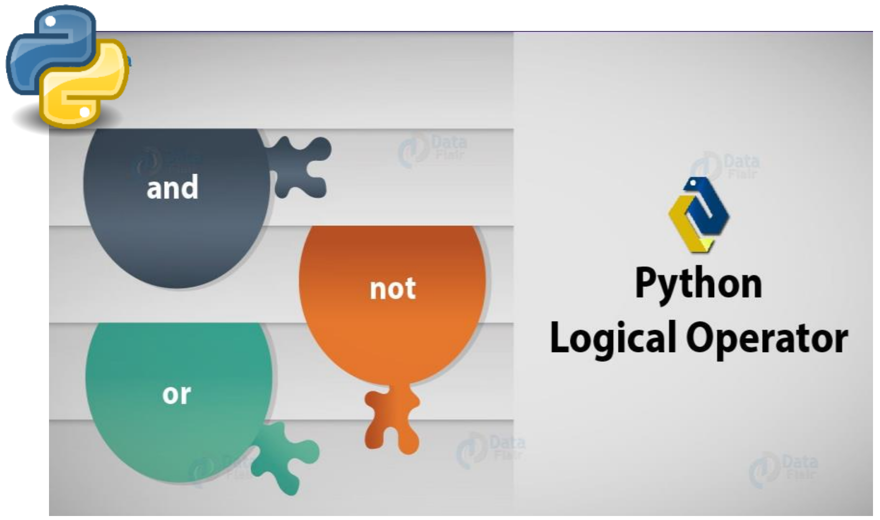


Comments in Python

Single line Comment

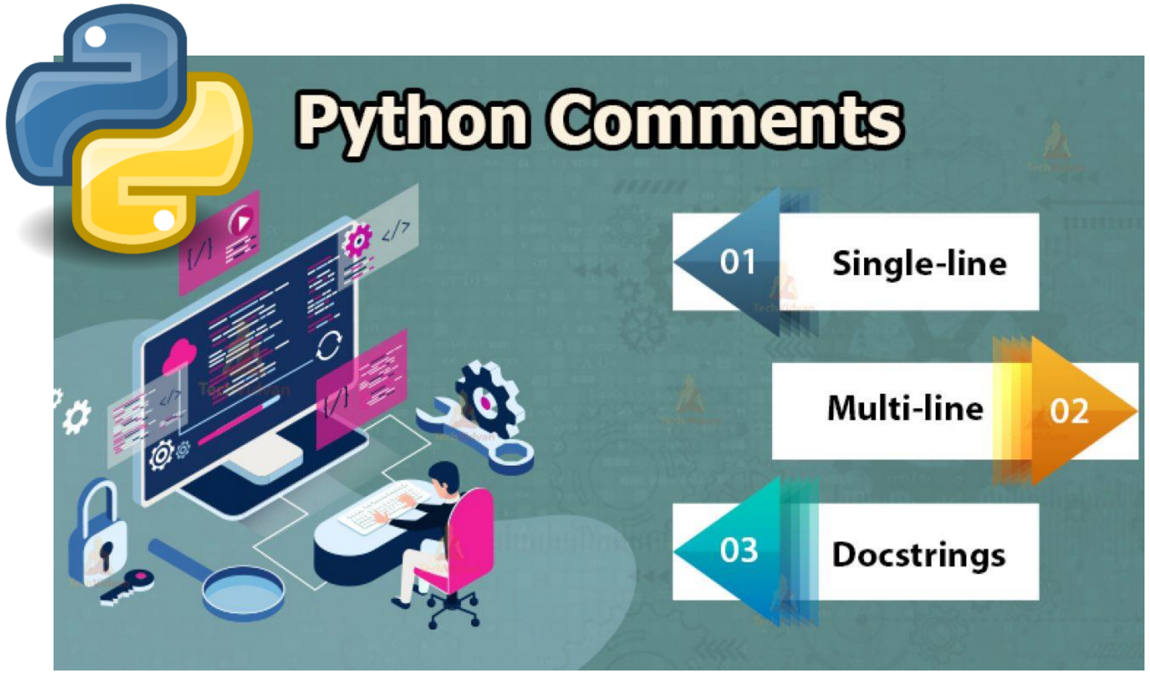
- To apply the comment in the code use the hash(#) at the beginning of the statement or code.

```
# Single line comment
```

Multi line Comment

- To apply multiline comment use hash(#) at the beginning of every line.

```
# First line of the comment
# Second line of the comment
# Third line of the comment
```



Comments in Python Contd…

Docstring Comments

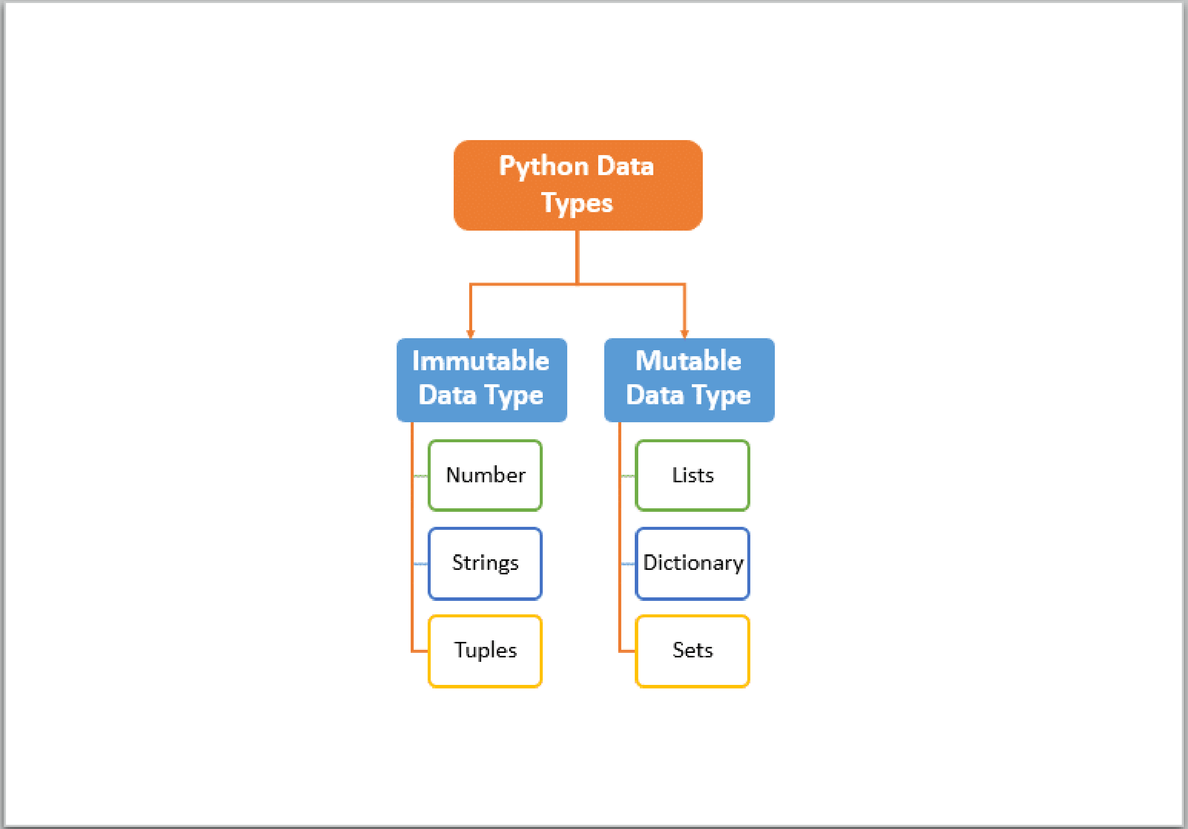
- The docstring comment is mostly used in the module, function, class or method.

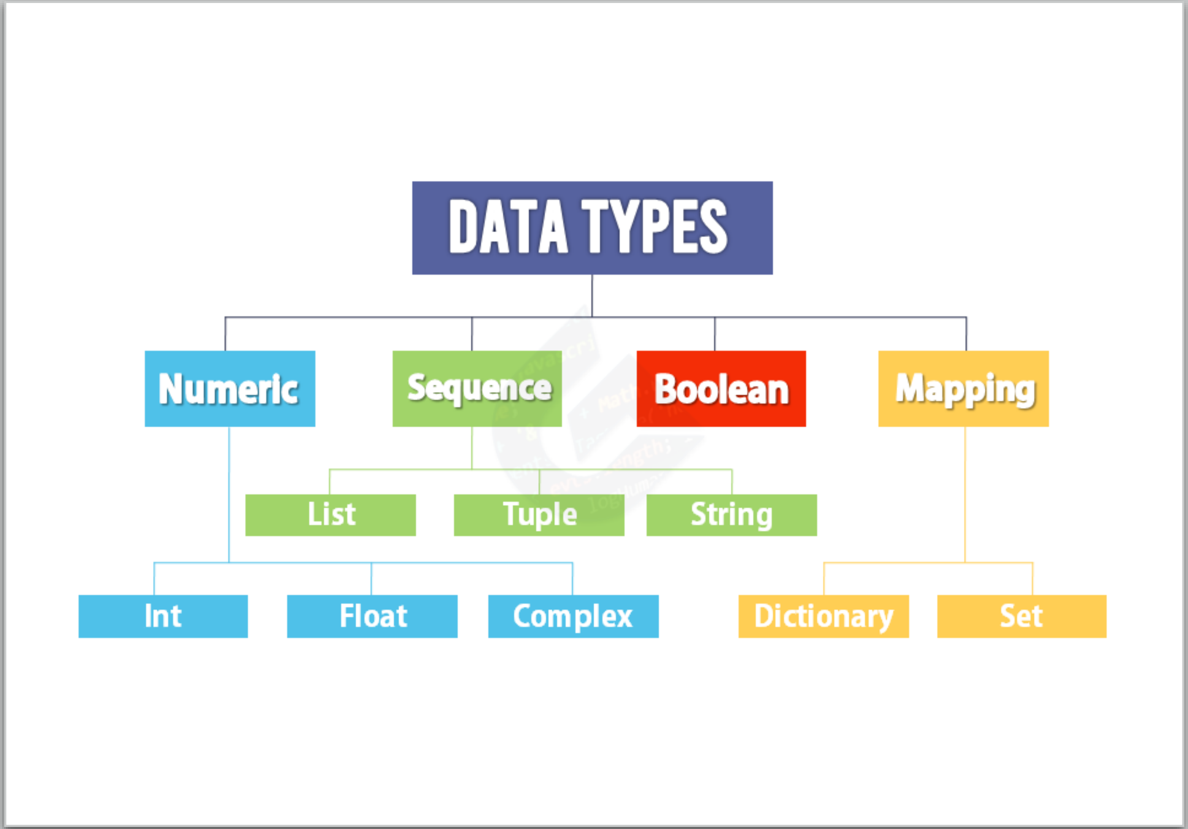
```
def intro():
  """
  This function prints Employee details
  """
  print(“Employee details")


intro()
```

Data Types in Python

Data Types in Python





Data Types in Python Contd…

NUMERIC TYPE:

- Number stores numeric values.
- The integer, float, and complex values belong to a Python Numbers data-type.
- type() function is used to know the data-type of the variable.
- isinstance() function is used to check an object belongs to a particular class.

Data Types in Python Contd…

Numeric Example

```
>>> num=2.5
>>> type(num)
Output:
<class 'float’>

>>> num1=55
>>> type(num1)
Output:
<class 'int'>
```

Complex:

```
>>> result=2+3j
>>> result
Output:
(2+3j)

>>> type(result)
Output:
<class 'complex'>
```

Data Types in Python Contd...

SEQUENCE TYPE

String:

- The string can be defined as the sequence of characters represented in the quotation marks.
- Python string can be single, double, or triple quotes.
- The operator + is used to concatenate two strings.
- operator * is known as a repetition operator.

Data Types in Python Contd…

String Example

```
>>>name=”Python”
>>>name+” rocks”
Output:
Python rocks

>>> "python " *2
Output:
'python python '
```

Data Types in Python Contd...

LIST:

- List is an ordered sequence of items.
- All the items in a list do not need to be of the same type.
- Items separated by commas are enclosed within brackets [ ].

```
>>> num=[22,33,44,55]
>>>num
Output:
[22,33,44,55]

>>>num[0]
Output:
22
[can retrieve with specific index]
```

Data Types in Python Contd…

List Example

```
Project=[“BI”,”ATM”,”BFS”]
Employee = [12,’vimala’,3333]
value=[Employee,Project]

Output:
            [[12,’vimala’,3333], [“BI”,”ATM”,”BFS”]]
List is Mutuable = can change the values
```

Data Types in Python Contd...

TUPLE:

- Tuple is an ordered sequence of items same as a list. The only difference is that tuples are immutable. Tuples once created cannot be modified.
- Tuples are used to write-protect data and are usually faster than lists as they cannot change dynamically.
- It is defined within parentheses () where items are separated by commas.

```
>>> tup=(12,33,44,55)
>>> tup

Output:
(12, 33, 44, 55)
```

Data Types in Python Contd...

MAPPING
SET:

- Set is an unordered collection of unique items.
- Set is defined by values separated by comma inside braces { }.
- Items in a set are not ordered.

```
>>> s={21,71,1,51}
>>> s
Output
{1, 51, 21, 71}

>>> s={3,4, 5,3,4}
>>> s
Output:
{3, 4, 5} [does not give the repeated value]
```

Data Types in Python Contd...

DICTIONARY:

- Dictionary is an unordered collection of key-value pairs.
- It is generally used when we have a huge amount of data.
- Dictionaries are optimized for retrieving data. Key is used to retrieve the value.
- In Python, dictionaries are defined within braces {} with each item being a pair in the form key:value.
- Key and value can be of any type.

Data Types in Python Contd…

Difference between List and Dictionary

List	Dictionary
Elements are in order	Elements are unorder
List contain data types like Integers, Strings, as well as Objects.	It is used to store data values like a map
They are accessed via numeric indices.	Elements are accessed using key values

Data Types in Python Contd...

BOOLEAN

```
>>> a=34
>>> b=22
>>> comp=a>b
>>> comp
Output:
True

>>> a<b
Output:
False

>>> type(comp)
Output:
<class 'bool'>
```

Think & Answer

1. Is python a case sensitive language?
2. What data type is used to store values in terms of key and value?
3. What will be the output of the following Python statement?

   >>>"You"+"rock"
4. Give 2 example for Magic methods in Python?
5. Which type is not ordered and does not allow duplicates?

Think & Answer

1. True
2. Dictonary
3. Yourock
4. __init__, __add__, __len__
5. Set

Thank you

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