Python Training Certification Course

Python Basics

```
#include <iostream>
#include <cstdlib>
using namespace std;
int main()
{
    cout << "Hello, world!" << endl;
    return 0;
}
```

Learning Objectives

By the end of this lesson, you will be able to:

- Download and set up Python console
- Illustrate Python script
- Explain the different data types and Input/Output functions

Introduction

Basics of Programming Languages

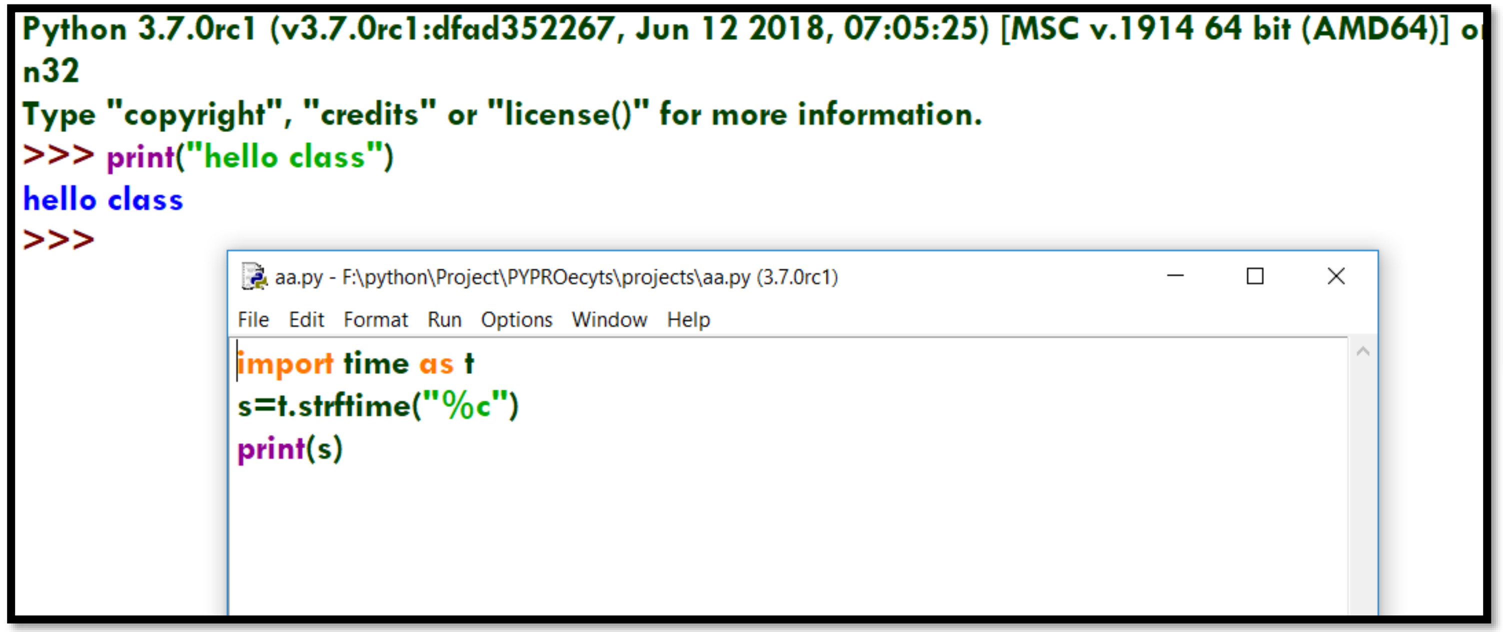
Code or **source code**: The sequence of instructions in a program.

Syntax: The set of legal structures and commands that can be used in a particular programming language.

Output: The messages printed to the user by a program.

Console: The text box onto which output is printed.

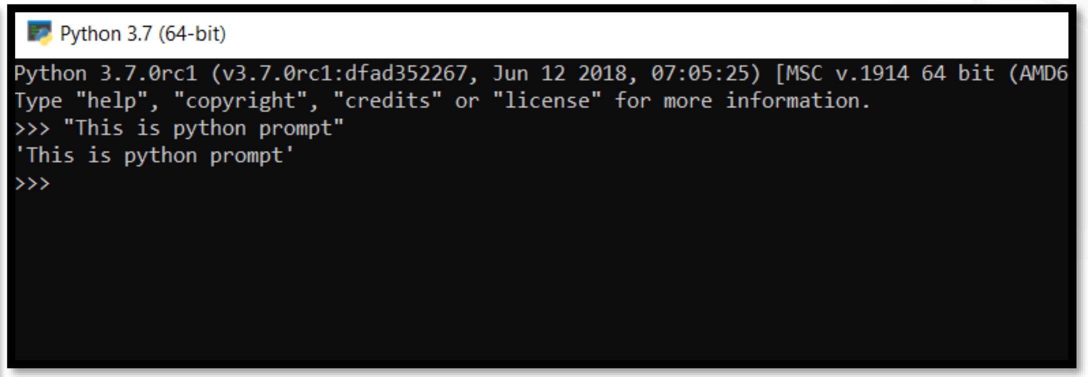
Some source code editors pop up the console as an external window, while others have their own console window.



```
Python 3.7.0rc1 (v3.7.0rc1:dfad352267, Jun 12 2018, 07:05:25) [MSC v.1914 64 bit (AMD64)] o
n32
Type "copyright", "credits" or "license()" for more information.
>>> print("hello class")
hello class
>>>
```

aa.py - F:\python\Project\PYPROecyts\projects\aa.py (3.7.0rc1)
File Edit Format Run Options Window Help

```
import time as t
s=t.strftime("%c")
print(s)
```



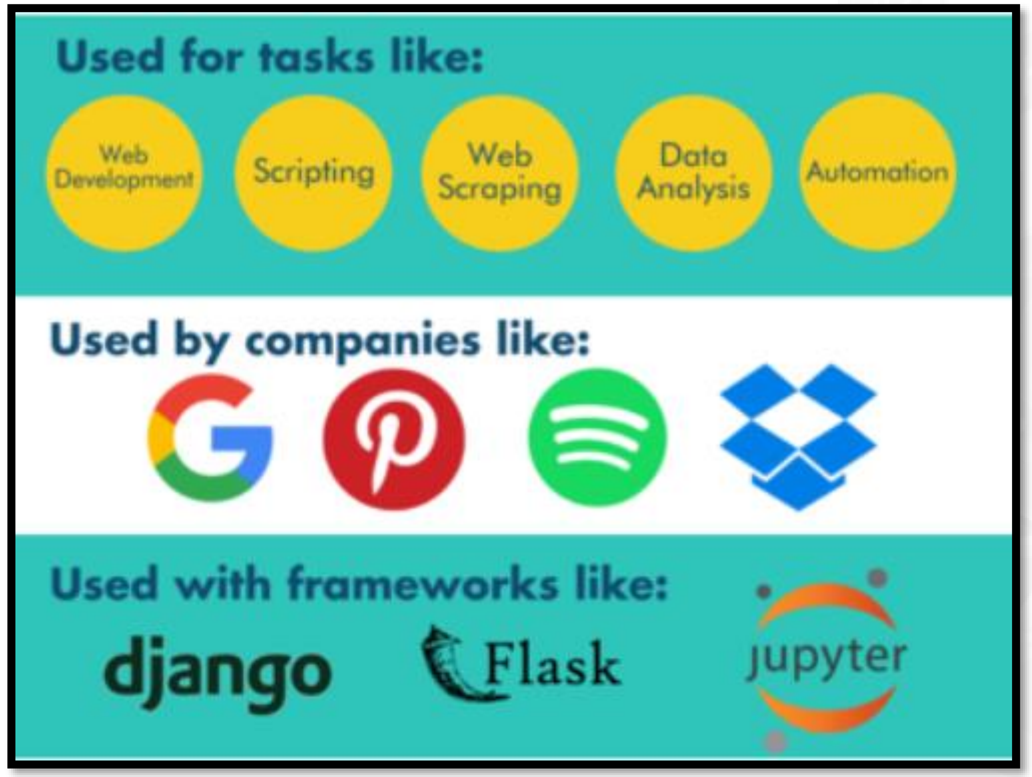
```
Python 3.7.0rc1 (v3.7.0rc1:dfad352267, Jun 12 2018, 07:05:25) [MSC v.1914 64 bit (AMD6
Type "help", "copyright", "credits" or "license" for more information.
>>> "This is python prompt"
'This is python prompt'
>>>
```

What Is Python?

Python is a **high-level**, **interpreted**, **object-oriented** programming language. It was created by **Guido van Rossum** in 1991.

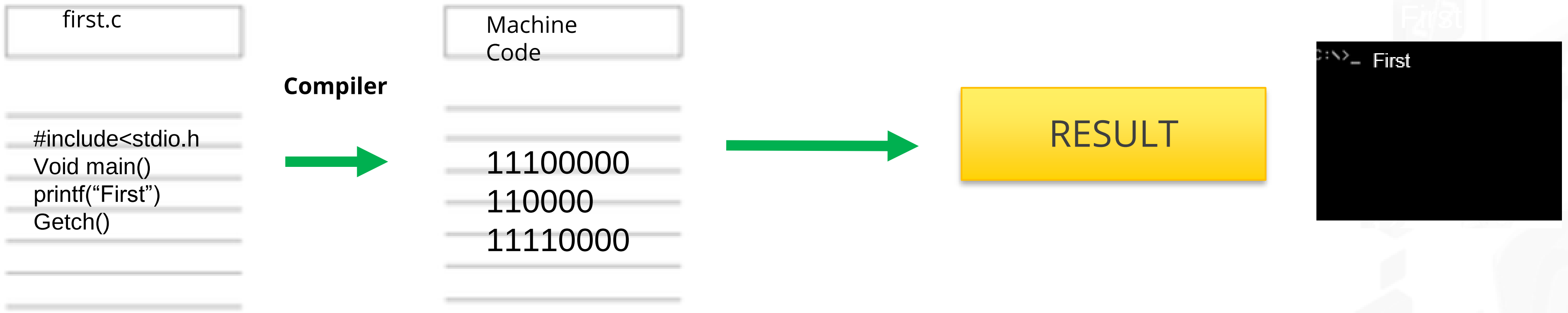
Key features:

1. Simple syntax
2. Open source
3. Scripting language
4. Dynamic
5. Interactive shell
6. Automatic memory management
7. Keep in mind indentation
8. Portable



Compiler and Interpreter

A **compiler** is a special program that processes statements written in a programming language and turns them into machine language or **code** that a computer's processor uses.

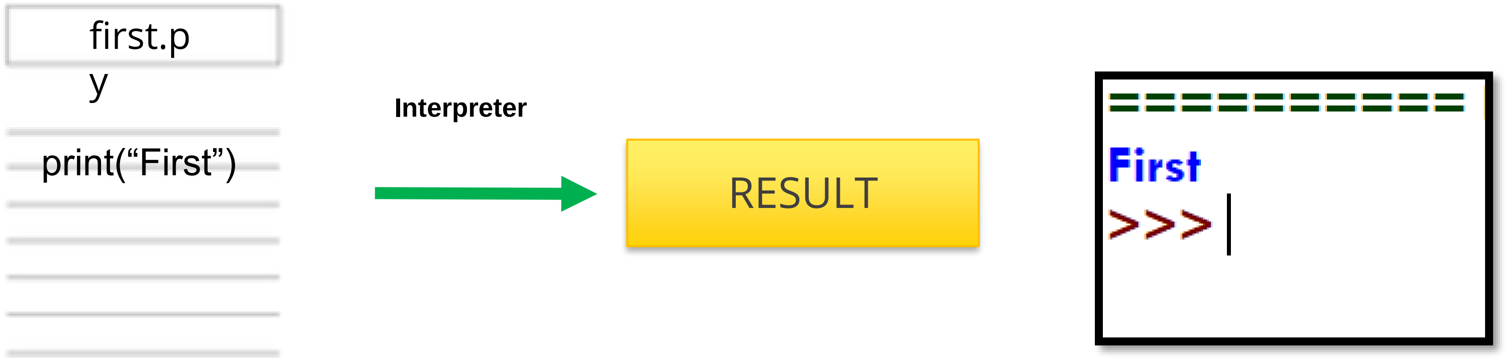


```
#include<stdio.h
Void main()
printf("First")
Getch()
```

```
11100000
110000
11110000
```

```
C:\>_ First
```

An **interpreter** is a program that reads and executes code. This includes source code, pre-compiled code, and scripts.



```
print("First")
```

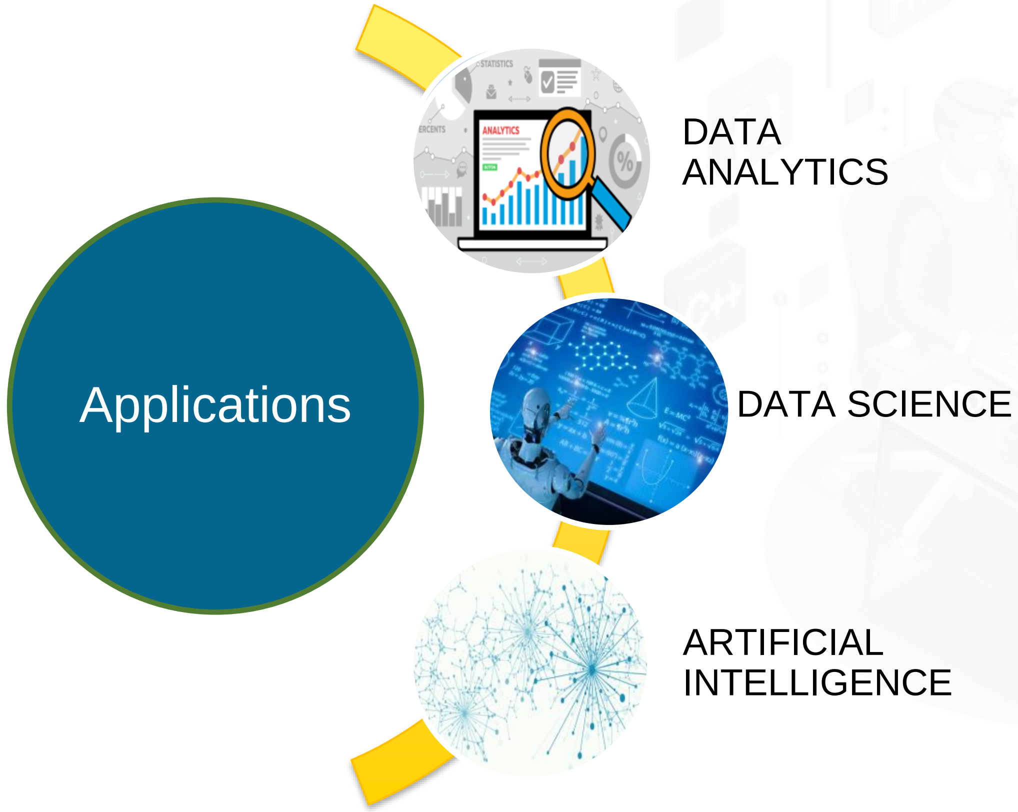
```
==========
First
>>>|
```

Why Python?

Python is an open source, object-oriented, easy-to-learn, high-level programming language that makes it attractive for Rapid Application Development. Its simple, easy-to-learn syntax emphasizes on readability. Python supports modules and packages, which encourage program modularity and code reuse.

Applications:

1. Web Development and GUI Programming
2. Machine Learning
3. Data Analytics
4. Artificial Intelligence
5. Internet of Things

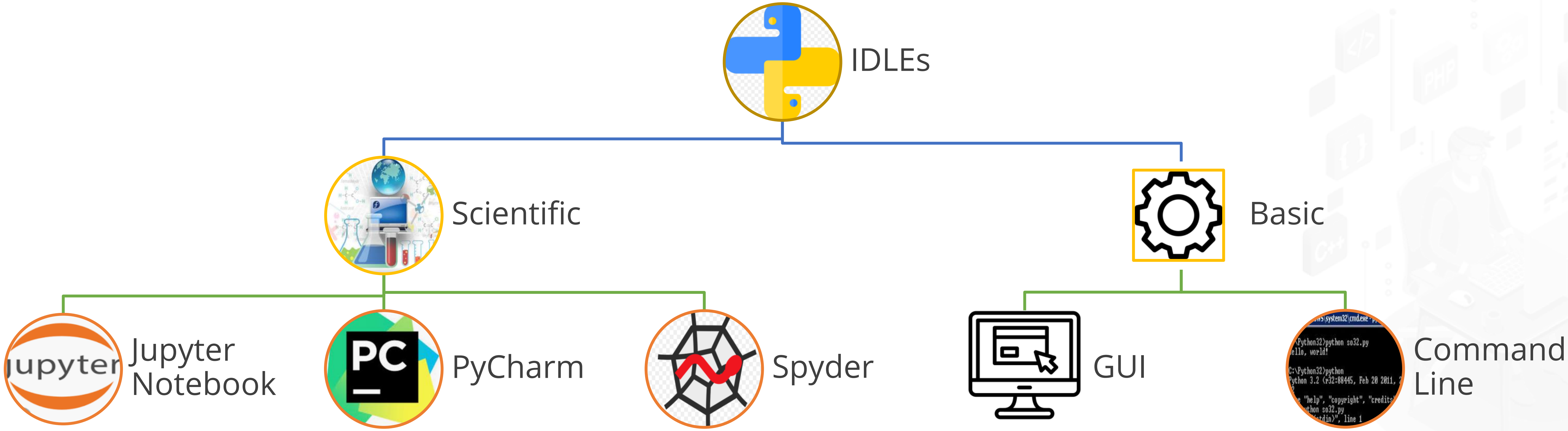


FULL STACK

Software Installations and Setup

Environments for Python

Python has both basic and scientific learning environments called IDLEs(Integrated Development and Learning Environment), where we write code and check outputs.



IDLEs

Scientific

Basic

Jupyter Notebook

PyCharm

Spyder

GUI

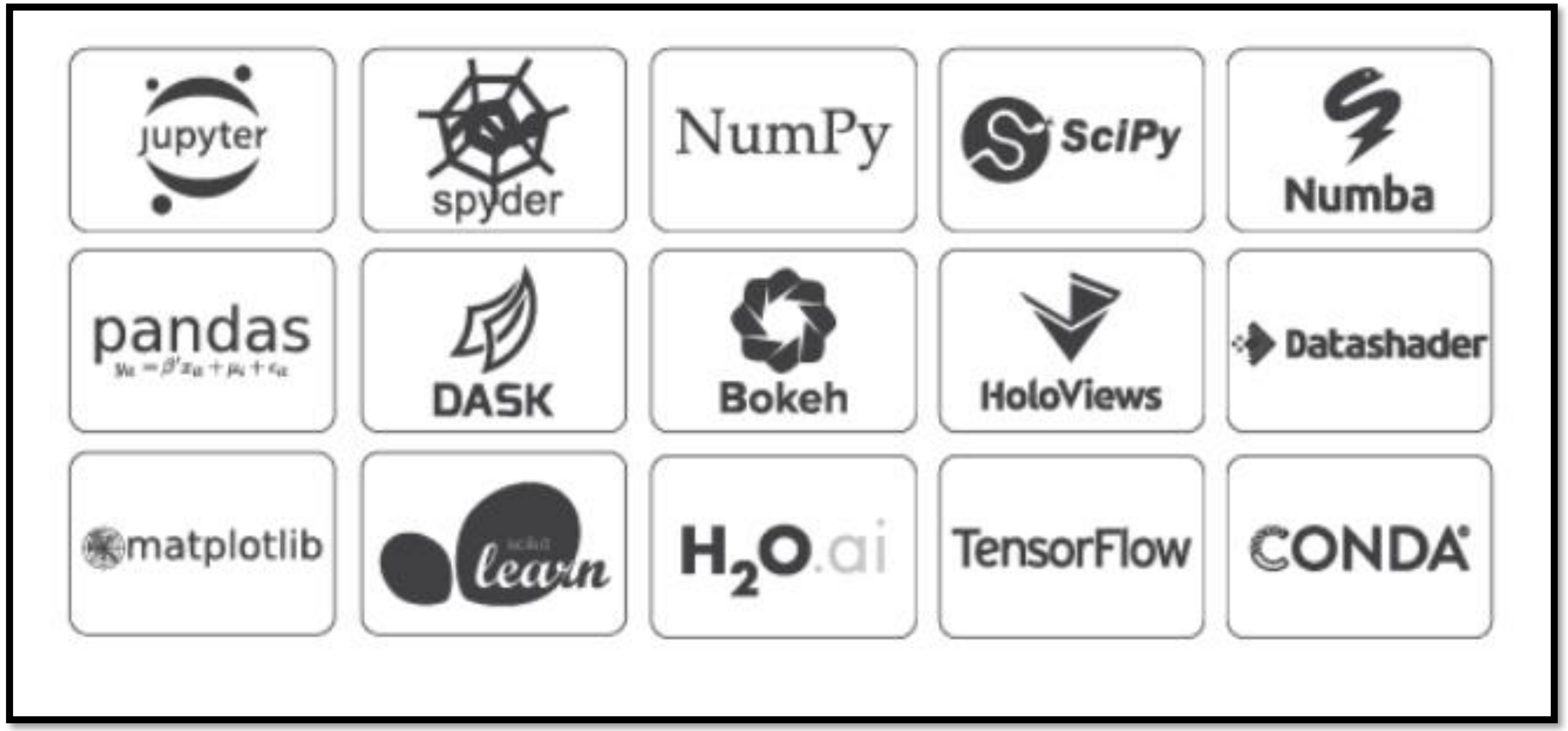
Command Line

Python Installation Specification

1. Disk space: 1 GB
2. Memory: Minimum 2 GB RAM
3. OS: Runs on Windows, Mac, and Linux

Anaconda

Anaconda is the open source free distribution for Python IDLEs. It is **Data Analytics** Platform for Project development.



Install Python IDLE

Duration: 25 min.

Objective: Install Python IDLE from the official website on your local system.

1. Download Python
2. Click on Install Now
3. Download Anaconda
4. Click the Next button to start the installation
5. Click the Install button
6. Click the Finish button to complete the installation

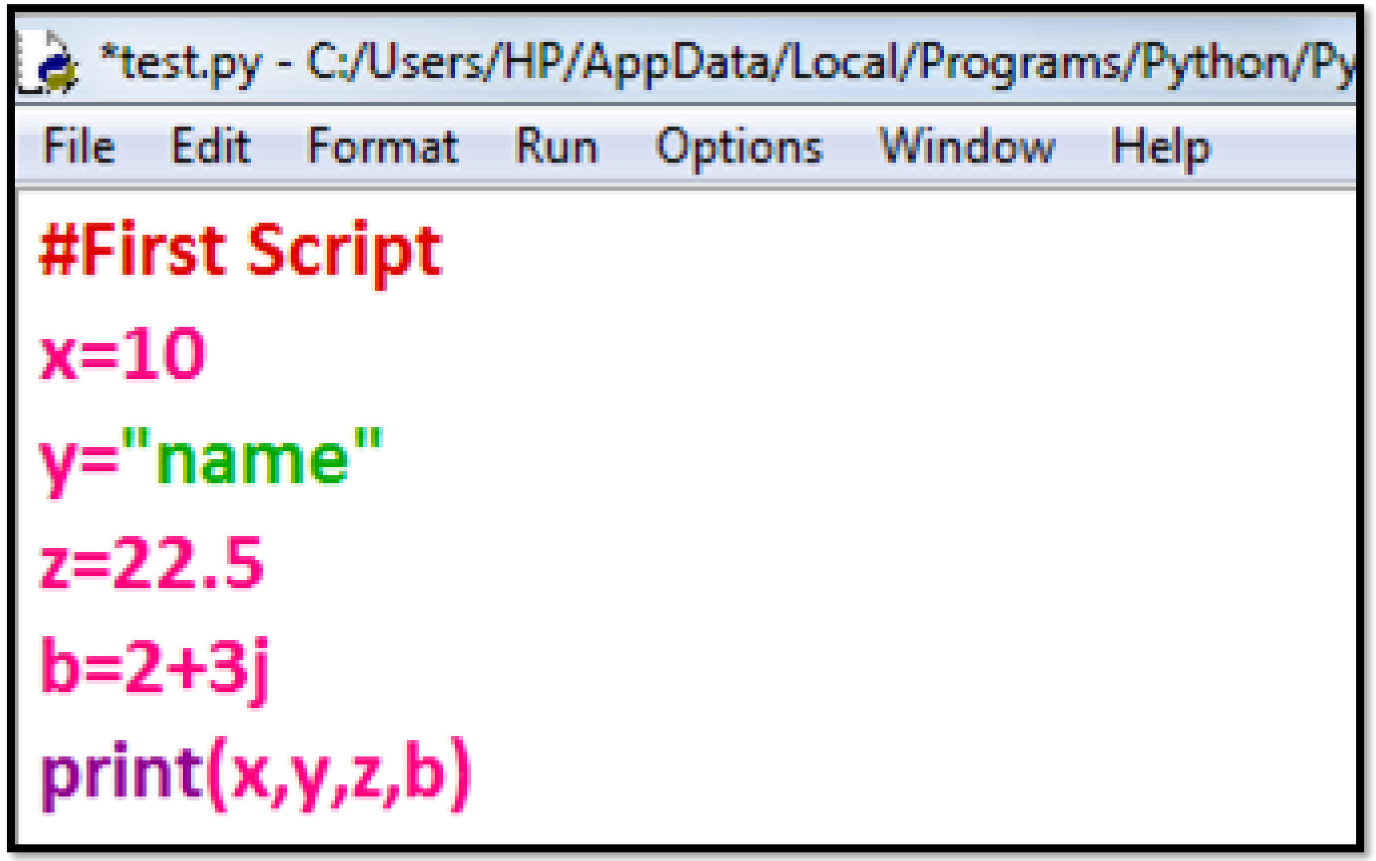
ASSISTED PRACTICE

First Python Script

Writing Program in Python IDLE

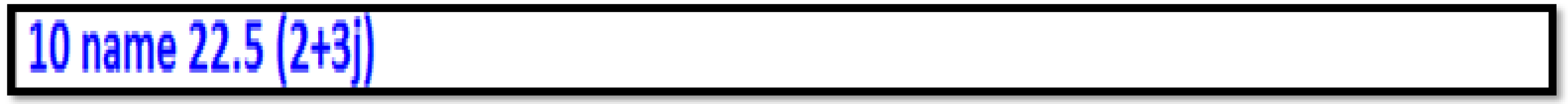
A code written in Python is called as a **Script.** It is saved with **.py** file extension**.**

Script


*test.py - C:/Users/HP/AppData/Local/Programs/Python/Py
File Edit Format Run Options Window Help

```
#First Script
x=10
y="name"
z=22.5
b=2+3j
print(x,y,z,b)
```

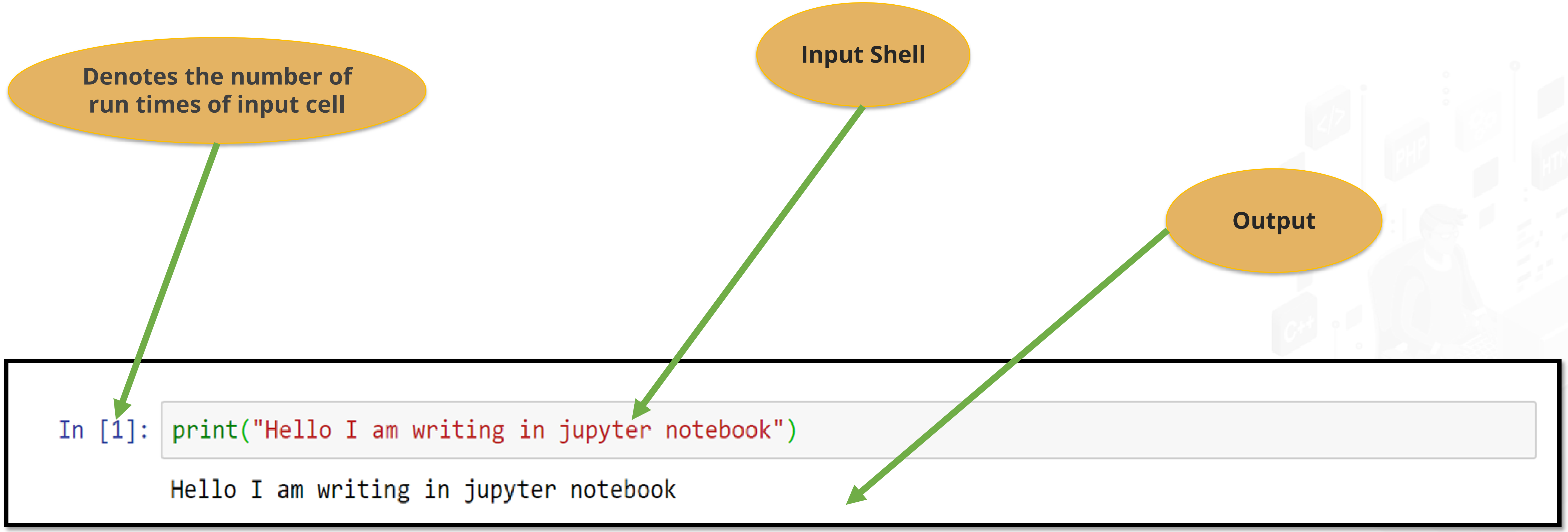
OUTPUT



```
10 name 22.5 (2+3j)
```

First Program in Jupyter Notebook

In case of Jupyter Notebook ,script(Input) and output appear in same window.



Denotes the number of run times of input cell

Input Shell

Output

```
In [1]: print("Hello I am writing in jupyter notebook")

        Hello I am writing in jupyter notebook
```

FULL STACK

Data Types

Numbers

S.No	Type	Description	Examples
1.	Integer	- float values are specified with a non-decimal point - signed integers of non-limited length - Class **int**	**1,-1,88**
2.	Float	- float values are specified with a decimal point - Upto 15 decimal places - Class **float**	**-3.8,0.6**
3.	Complex	- Holds Complex numeric values - Class **complex**	**9+6j**

Note:

- ✓ **long class exists in Python 2.x versions, but not in Python 3.x versions.**
- ✓ **In Python, assigning variables while declaring data types is not mandatory.**

Sequence

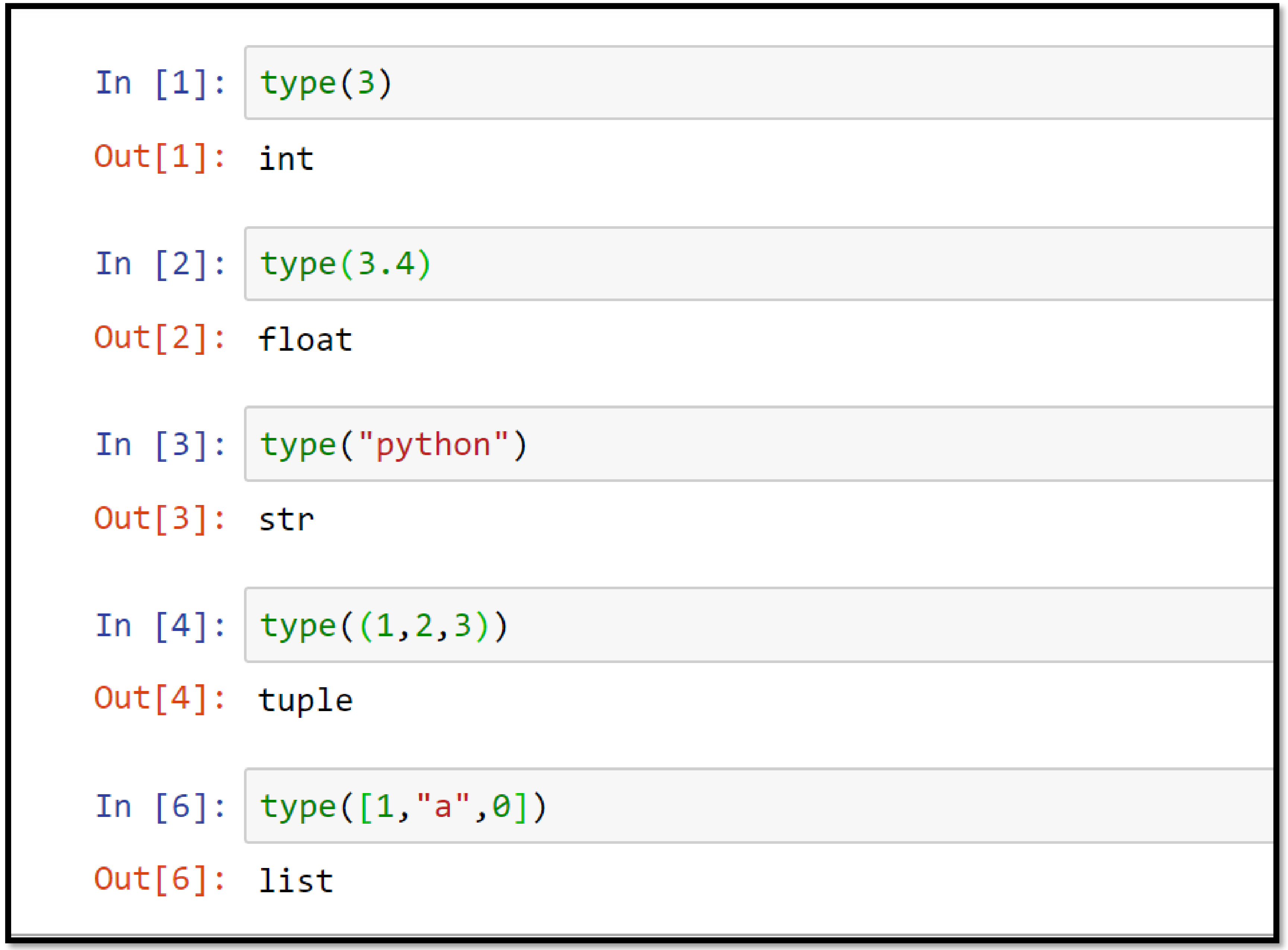
S.No	Type	Description	Examples
1.	Strings	- Sequence of character data - The string type in Python is called str	**“Python”** **‘Data’**
2.	List	- It is an ordered collection of objects - List elements can be accessed by index - Mutable	**[‘a’,1,2,3]** **[1,2,3]**
3.	Tuples	- Tuples are defined by enclosing the elements in parentheses (()) instead of square brackets ([]) - Immutable	**(2,3,’9’)** **(1,6,-8)**

Note:

✓ **Immutable : Once declared, we cannot change or delete the members within sequence .**

How to Check Data Type of Variable Declared?

In python, we use **type()** function to check data type of a declared variable. This function returns the class to which the declared variable belongs.

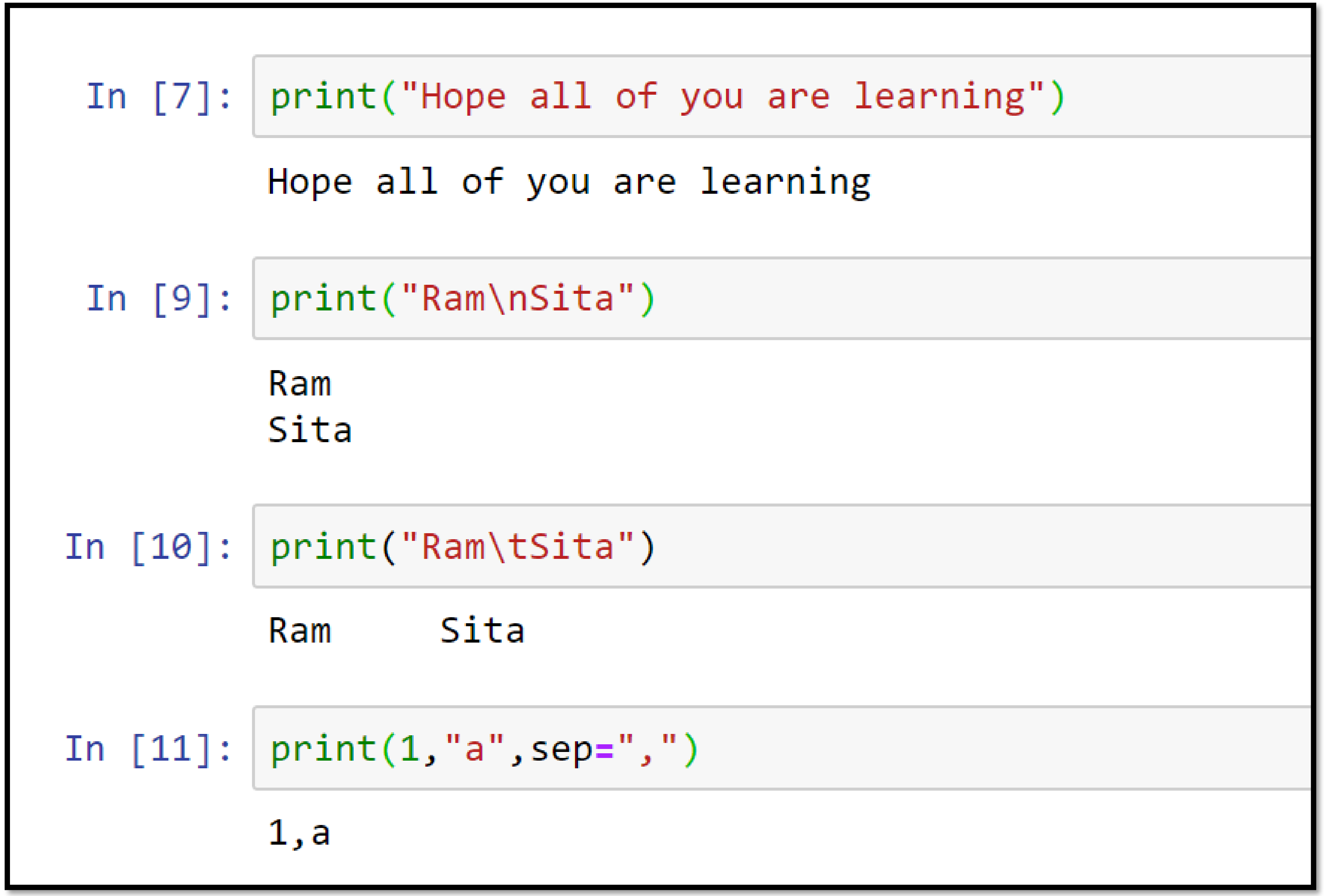


```
In [1]: type(3)

Out[1]: int

In [2]: type(3.4)

Out[2]: float

In [3]: type("python")

Out[3]: str

In [4]: type((1,2,3))

Out[4]: tuple

In [6]: type([1,"a",0])

Out[6]: list
```

Input /Output Functions

Print Function

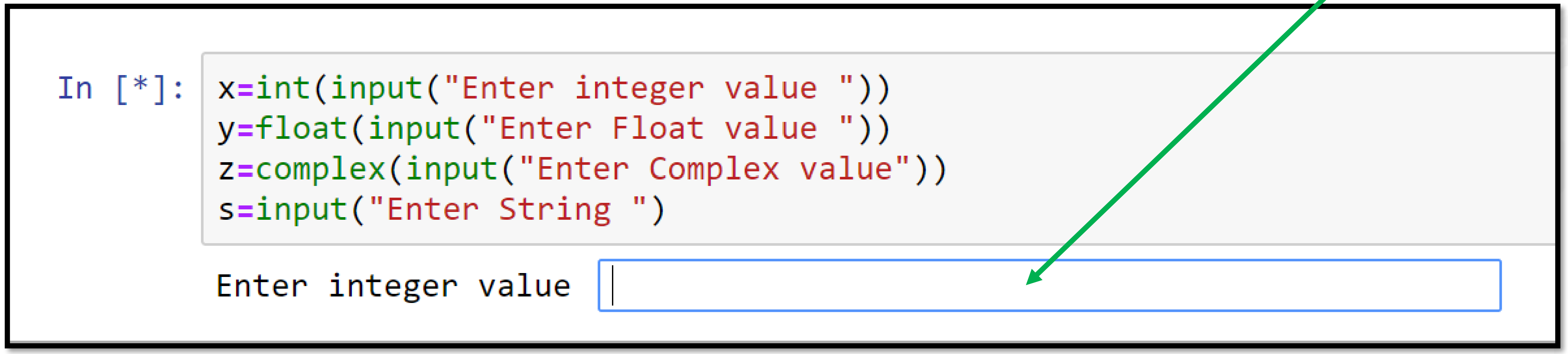
Print() function is used to display output on the screen.



```
In [7]: print("Hope all of you are learning")

        Hope all of you are learning

In [9]: print("Ram\nSita")

        Ram
        Sita

In [10]: print("Ram\tSita")

        Ram     Sita

In [11]: print(1,"a",sep=",")

        1,a
```

Input Function

Input() function is used to accept value from the user.

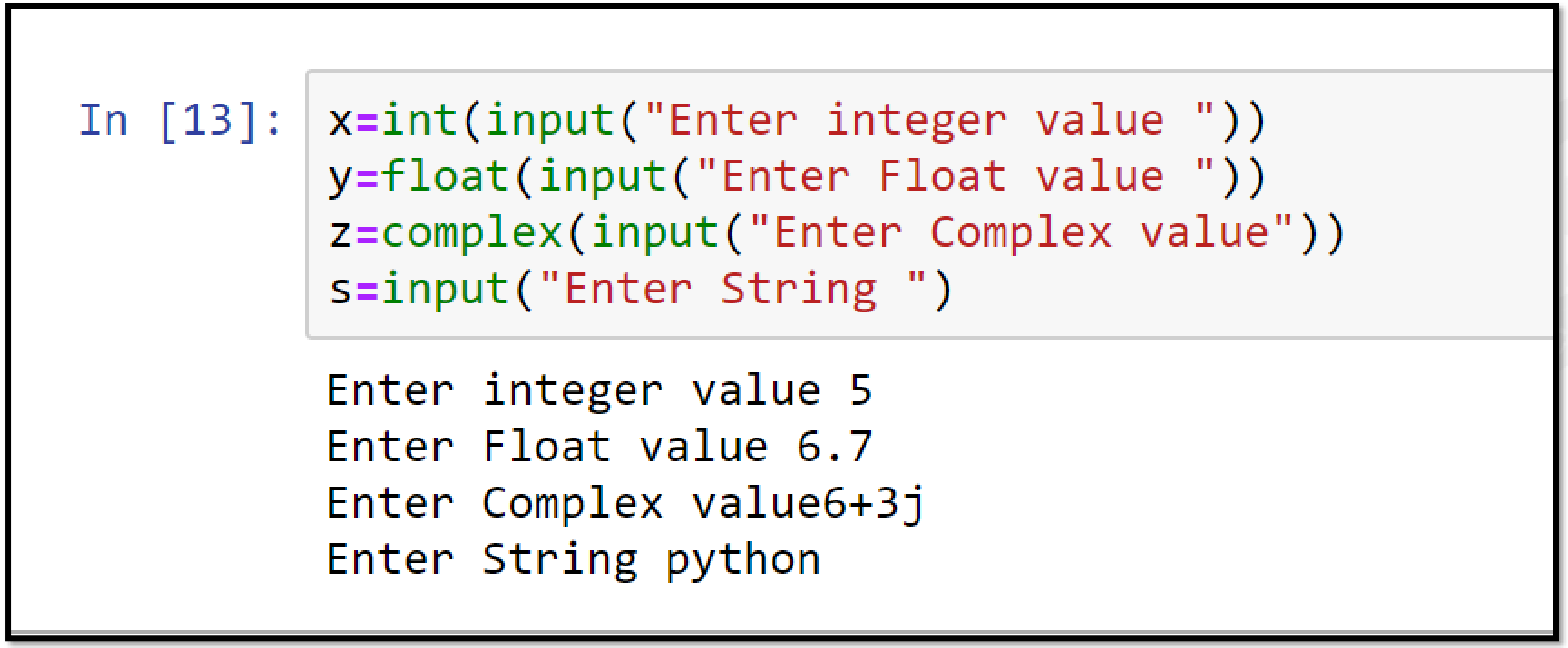


```
In [*]: x=int(input("Enter integer value "))
        y=float(input("Enter Float value "))
        z=complex(input("Enter Complex value"))
        s=input("Enter String ")

        Enter integer value
```

Input integer value here

Input Function

The **input**() method reads a line from **input** (usually user). It is the data type along with input function.



```
In [13]: x=int(input("Enter integer value "))
         y=float(input("Enter Float value "))
         z=complex(input("Enter Complex value"))
         s=input("Enter String ")

         Enter integer value 5
         Enter Float value 6.7
         Enter Complex value6+3j
         Enter String python
```

Basics of Python

Duration: 20 min.

Objective: Write a program using Python to demonstrate basics concepts in Python.

Steps to demonstrate basics concepts in Python:

1. Open Jupyter Notebook
2. Click on File New Notebook
3. Select Python (version 3)
4. Write your program
5. Save your program
6. Click on Run to execute program

ASSISTED PRACTICE

FULL STACK

Knowledge Check

Knowledge Check

1

A program written in Python is known as:

a. program

b. code

c. py

d. script

Knowledge Check

1

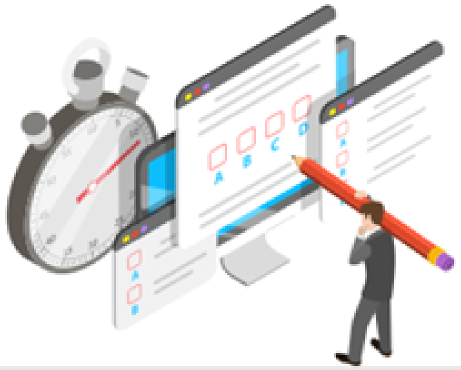
A program written in Python is known as:

a. program

b. code

c. py

d. script



The correct answer is **d**

Python is a scripting language and any program written in Python is called a script

Knowledge Check 2	Which of the following is a sequence data type in Python?

a. long

b. float

c. string

d. integer

Knowledge Check

2

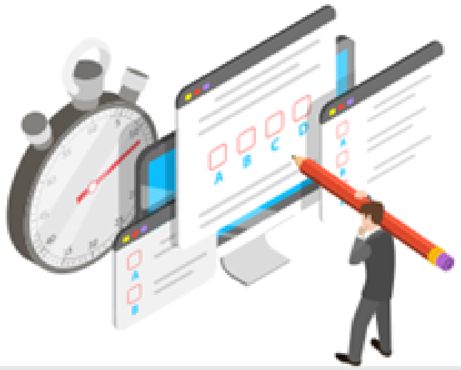
Which of the following is a sequence data type in Python?

a. long

b. float

c. string

d. integer



The correct answer is **c**

Strings store sequence of characters in Python.

Knowledge Check

3

Which of the following is a valid list in Python?

a. [1,2,3.4]

b. [1,"a",6]

c. [1,[2,3],"s"]

d. All of the above

Knowledge Check
3

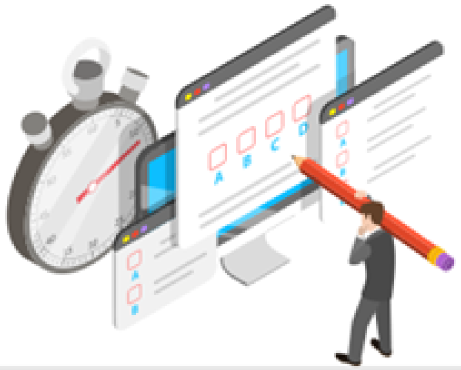
Which of the following is a valid list in Python?

a. [1,2,3.4]

b. [1,”a”,6]

c. [1,[2,3],”s”]

d. All of the above



The correct answer is **d**

List is a sequence data type in Python which can hold different data types members.

Knowledge Check

4

print(4,’Data’,123) will return output:

a. (4,Data,123)

b. (4 Data 123)

c. (4, Data 123)

d. 4, Data, 123

Knowledge Check

4

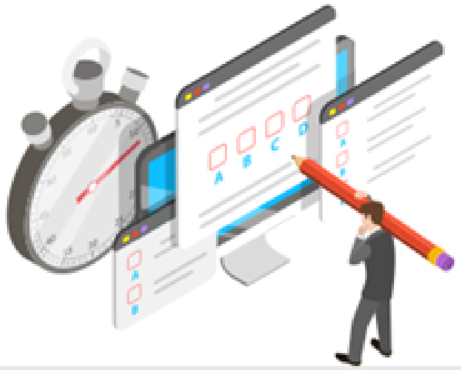
print(4,’Data’,123) will return output:

a. (4,Data,123)

b. (4 Data 123)

c. (4, Data 123)

d. 4, Data, 123



The correct answer is **b**

The print() function will not display the separator without sep() function.

Knowledge Check

5

In order to input variable x as float from user in Python, we write:

a. x = Input(float())

b. x = input(float())

c. x = float(input())

d. x = float(Input())

Knowledge Check

5

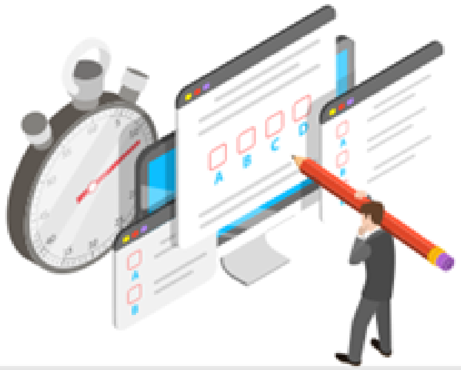
In order to input variable x as float from user in Python, we write:

a. x = Input(float())

b. x = input(float())

c. x = float(input())

d. x = float(Input())



The correct answer is **c**

To input a variable as float, mention the data type followed by input function.

Key Takeaways

- Python is simple language with easy syntax.
- Indentation matters in python
- Data type declaration is not needed for variable assignment in python