Lab:-1   Basic   Python

*Objectives:-
①. To learn how to write, run and debug simple Python programs.
②. To work with basic data structures such as lists, tuples, sets and dictionaries.
③. To perform basic input, output operations in Python programs.

Theory:-
   Python is a high level interpreted and object-oriented programming language developed by Guido van Rossum. It is widely used baecause of its simple syntax, readability and versability.

*Data types in Python
   Data types specify the type of data that a variable can store. Python is a dynamically typed language, meaning the datatype of a variable is determined at runtime.
   Common built-in data types in Python are:-
o Int :- stores whole numbers (eg:- 10, -5).
• float:- stores decimal numbers (e.g:- 3.14, 2.5).
• complex:- complex stores cumplex numbers (eg:- 2 +3j).
• str:- stores text or characters (e.g. "Python")
• bool:- stores boolean values (True or False).
• list:- stores ordered and mutable collections.
• tuple:- stores ordered and immutable collections.
• set:- stores unordered unique elements.
• dict:- stores data in key-value pairs.

* type() function: type() function is built in Python function used to determine the data type of a variable or value.
   syntax:- type (variable).

* input () function.

↳ It is used to take input from the user during program execution. By default, the input received is of string type, even if the user enters a number.

    Syntax:- variable = input ("Enter a value: ")

* working of type () function.

↳ when the type() function is applied to a variable, it returns the class of the object stored in that variable. This helps in debugging and ensures correct operations are performed on data.

    example:-

a = 10	Output:-
b = 2.5	< class 'int' >
c = 'python'	< class 'float' >
print (type(a)).	< class 'str' >.
print (type (b)).	
print (type (c)).	

* Need of Typecasting with Program.

    Since the input () function always returns data as a string typecasting is required to convert the input into the required data type for mathematical operations. Typecasting ensures proper calculations and avoids runtime errors.

    Common typecasting functions:-

    ○ int ()

    • float()

    ○ str ()

    • bool().

* Function:- function is a block of reusable code that performs a specific task. function helps reduce code reptition and improve program readibility.

Syntax:-

```
def function_name(parameters):
    statements
    return value
```

example:-
```
def add(a,b):
    return a+b;
```

* Program to find Area of a Rectangle

The area of rectangle is calculated using the formula:
Area = length * Breadth

Python Program:-

```
length = float(input("Enter length of rectangle:"))
breadth = float(input("Enter breadth of rectangle:"))
area = length * breadth;
print("Area of rectangle =" area):
```

* Discussion:-

In this lab, Basic Python concepts such as datatypes, input handling, typecasting, and functions were studied and implemented through simple programs. The use of the type() function helped in understanding how python identifies datatypes at runtime. Typecasting was necessary to perform arithmetic operation on user input. Writing small program like calculating the area of rectangle improved logical thinking and familiarity with Python syntax.

* Conclusion:-

This python basic lab successfully introduced fundamental programming concepts required for further learning.