Identifiying the differnet data types operations using + symbol :

1. **int type + int type ------>> int type**
   - Adding two integer type values will return result as Integer type only.
   - Here **+ operator** will perform **Arthematic** operation

   For example:

   >>> 10 + 20 # 30

2. **float type + float type ------>> float type**
   - Adding two flaot type values will return result as Float type only.
   - Here **+ operator** will perform **Arthematic** operation

   For example:

   >>> 10.0 + 20.5 # 30.5

3. **int type + float type ------>> float type**
   - Adding one integer type value and one float type value then it will return result as Float type only.
   - Here **+ operator** will perform **Arthematic** operation

   For example:

   >>> 10 + 20.5 # 30.5

4. **str type + str type ------>> str type**
   - Adding two string type values will return result as String type only.
   - Here **+ operator** will perform **Concatination** operation.

   For example:

   >>> “Hello” + “Python” # “HelloPython”

5. **int type + str type ------>> TypeError**
   - Adding one integer type value and one string type value then it will return result as exception like **TypeError**.
   - Here **+ operator** will perform **Arthematic** operation

   For example:

   >>> 10 + “Python” # TypeError

   TypeError: unsupported operand type(s) for +: 'int' and 'str'

Reading data from Keyboard:

- Input to the program can come in various ways, for example from a database, from another computer, from mouse clicks and movements or from the internet.
- Generally in most cases the input comes from the keyboard. For this purpose, Python provides the function input().
- The input of the user will be returned as a string without any changes.
- If this raw input has to be transformed into another data type needed by the algorithm, we can use either "casting (type casting)" functions or the "eval()".

For example :

- **Direct input from user (default data type is string)**

```
>>> n  =  input('Enter Number: ')          # Enter Number: 10
>>> print(n)                               # 10
>>> type(n)                                # <class 'str'>
```

- **Converting str type data by using int casting function**

```
>>> n  =  int(input('Enter Number: '))     # Enter Number: 10
>>> print(n)                               # 10
>>> type(n)                                # <class 'int'>
```

- **Converting str type of data by using "eval()" functions**

```
>>> n1=eval(input('Enter Number: '))       # Enter Number: 10
>>> print(n1)                              # 10
>>> type(n1)                               # <class 'int'>
```

For example :

In interactive mode:

```
>>> name = input('What Is Your Name: ')
What Is Your Name: Srinivas
>>> loc = input("What is Your Location: ")
What is Your Location: Guntur
>>> print(" Hello " + name +", How are You. How is your " +loc+ ".");
```

Hello Srinivas , How are You. How is your Guntur.

In script mode:

- Open file and write the following code and save the file as fileName.py

```
name = input("What is your Name : ")
loc = input("What is your Location : ")
print('Hello ' + name +', How are you. How is Your ' +loc+'.')
```

- If we run the file, we can see the following in the python screen.

Output:

```
What is your Name : Srinivas
What is your Location : Guntur
Hello Srinivas , How are you. How is Your Guntur.
```

Type Conversion Functions :

---- >> We can convert datatype in two different ways:

1. type casting functions
2. **eval()** function

Type casting functions

------>> These type conversion functions are used to convert string type data into required types

1. int():

This int() function is used to convert into int data type.

For example : get two integers from the user and perform addition on those user values

Way-1

```
>>> a = input("Enter First Number: ")          # Enter First Number: 10
>>> b = input("Enter Second Number: ")         # Enter Second Number: 20
>>> print (a)                                  # 10
>>> print (b)                                  # 20
>>> type(a)                                    # <class 'str'>
>>> type(b)                                    # <class 'str'>
>>> id(a)                                      # 52351712
```

```
>>> id(b)                                   # 6925376

>>> c=a+b                                   # adding two str variables
>>> print(c)                                # 1020
>>> type(c)                                 # <class 'str'>
>>> id(c)                                  # 52351136

>>> x=int(a)                                # converting str ‘a’ into int ‘x’
>>> y=int(b)                                # converting str ‘b’ into int ‘y’
>>> print(x)                                # 10
>>> print(y)                                # 20
>>> type(x)                                 # <class 'int'>
>>> type(y)                                 # <class 'int'>
>>> id(x)                                   # 1625909520
>>> id(y)                                   # 1625909680

>>> z=x+y                                   # adding two int variables
>>> print(z)                                # 30
>>> type(z)                                 # <class 'int'>
>>> id(z)                                   # 1625909840
```

Way-2 (shortest way)

```
>>>print("The sum is " + str(int(input("Enter First Number: ")) + int(input("Enter Second Number: "))))
>>>Enter First Number: 10
>>>Enter Second Number: 20
>>>The sum is 30
```

2. Float():

This float() conversion function is used to convert other types into float type.

Way-1

```
>>> a=input("Enter First Number: ")              Enter First Number: 10.5
>>> b=input("Enter Second Number")             Enter Second Number20.5
>>> print (a)                                  10.5
```

```
>>> print(b)                    20.5
>>> type(a)                     <class 'str'>
>>> type(b)                     <class 'str'>
>>> id(a)                       52354240
>>> id(b)                       52354144

>>> c=a+b
>>> print(c)                    10.520.5
>>> type(c)                     <class 'str'>
>>> id(c)                       52367096

>>> x=float(a)
>>> y=float(b)
>>> print(x)                    10.5
>>> print(y)                    20.5
>>> type(x)                     <class 'float'>
>>> type(y)                     <class 'float'>
>>> id(x)                       47459712
>>> id(y)                       47460096

>>> z=x+y
>>> print(z)                    31.0
>>> type(z)                     <class 'float'>
>>> id(z)                       46410368
```

Way-2 (shortest way)

```
>>>print(float(input("Enter First Number: ")) + float(input("Enter Second Number: ")))
>>>Enter First Number: 10.5
>>>Enter Second Number: 20.5
>>>31.0
```

3. Complex():

This complex() conversion function is used to convert string type data into Complex type.

For example :

Way-1

```
>>> a=input("Enter Number: ")          Enter Number: 2+3j
>>> print(a)                          2+3j
>>> type(a)                           <class 'str'>
>>> id(a)                             52351712
>>> x=complex(a)
>>> print(x)                          (2+3j)
>>> type(x)                           <class 'complex'>
>>> id(x)                             47539768
```

Way-2

```
>>>print(complex(input("Enter Number: ")))
>>>Enter Number: 4+6j
>>>(4+6j)
```

4. bool():

- This bool() conversion function is used to convert string type data into Boolean type.

Way-1

```
>>>a=input("Enter either True or False: ")     Enter either True or False: True
>>> print(a)                                   True
>>> type(a)                                    <class 'str'>
>>> id(a)                                      52354272
>>> x=bool(a)
>>> print(x)                                   True
>>> type(x)                                    <class 'bool'>
>>> id(x)                                      1625727600
```

Way-2

```
>>>print(bool(input("Enter Either True or False: ")))
>>>Enter Either True or False: True
```

>>>True

eval() function:

- The python eval() function parses the expression passed to it and runs python expression(code) within the program.
- eval() can identify the user input data type when user enterd data using keybord and stored in a variables.

Examples:

- **Converting int value:**

```
>>> a = eval(input('enter value for a: '))
enter value for a: 10
>>> print(a)                    # 10
>>> type(a)                     # <class 'int'>
```

- **Converting float value**

```
>>> b=eval(input('enter value for b: '))
enter value for b: 10.6
>>> print(b)                    # 10.6
>>> type(b)                     # <class 'float'>
```

- **Converting string value**

```
>>> c=eval(input("enter value for c: "))
enter value for c: 'JS Rao'
>>> print(c)                    # JS Rao
>>> type(c)                     # <class 'str'>
```

- **Converting complex value**

```
>>> d=eval(input('enter value for d: '))
enter value for d: 2+5j
>>> print(d)                    # (2+5j)
>>> type(d)                     # <class 'complex'>
```

- **Converting bool value**

```
>>> e=eval(input('enter value for e:'))
```

```
enter value for e:True
>>> print(e)                    # True
>>> type(e)                     # <class 'bool'>
```