Input Function, Variables, and Arithmetic Operations in Python

1. Input Function

The input() function in Python is used to read data from the user. It allows the user to type a value from the keyboard while the program is running.

1.1 Displaying Messages Before Reading Input

We can also use the print() function to display a message before reading input, to guide the user. By default, the value read by input() is always a string (text). If we want to use it in calculations, we must convert it to a numeric type. We use int() to convert to an integer and float() to convert to a real number.

Example of summing three integers:

```
print("Enter the first number:")
Nb1 = int(input())
print("Enter the second number:")
Nb2 = int(input())
print("Enter the third number:")
Nb3 = int(input())
Result = Nb1 + Nb2 + Nb3
print(Result)
```

Run
Enter your first integer
5
Enter your second integer
8
Enter your third integer
2
The sum is: 15

1.2 Using the input() Function to Display Messages and Read Values

We can also use the input() function in Python to display a message and read a value at the same time. This makes the program shorter and more compact because we no longer need to use a separate print() statement before each input. The message written inside the parentheses of input() is automatically shown to the user, and then the program waits for them to enter a value.

```
# Read three integers using input() messages
Nb1 = int(input("Enter your first integer: "))
Nb2 = int(input("Enter your second integer: "))
Nb3 = int(input("Enter your third integer: "))
```

```
# Calculate the sum
Result = Nb1 + Nb2 + Nb3
# Display the result
print("The sum is:", Result)
```

```
Run
Enter your first integer: 5
Enter your second integer: 8
Enter your third integer: 2
The sum is: 15
```

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2. Variables and Variable Name

A variable is a named memory location used to store data. It allows the programmer to save and reuse information in a program.

2.1 Variable Name

A variable name is an identifier used to store and access data in memory. It must follow certain rules such as:

- It cannot start with a number.
- It cannot contain spaces or special symbols (except _).
- It must not be a reserved keyword (like if, for, while).

2.2 Types of Variables

Variables can have different data types, depending on the kind of value they store.

1. Integer (int) – used for whole numbers (e.g., 5, -3, 120).
    - Typical memory size: 2,4 bytes
2. Real (float) – used for decimal numbers (e.g., 3.14, -0.5).
    - Typical memory size: 4, 8 bytes
3. Boolean (bool) – used for logical values: True or False.
    - Stored in 1 bit of memory.
4. String (str) – used for text enclosed in quotes (e.g., "Hello").
    - Memory size depends on the number of characters.

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3. Arithmetic Operations in Python

In Python, we can perform different arithmetic operations on numeric variables such as integers (int) and real numbers (float). These operations allow us to calculate sums, differences, products, divisions, and more. Let's look at the main arithmetic operators used in Python:

Operator	Description	Example	Result
+	Addition	5 + 3	8
-	Subtraction	10 – 4	6
*	Multiplication	6 * 3	18
/	Division (returns a float)	8 / 2	4.0
//	Floor Division (integer division)	7 // 2	3
%	Modulus (remainder of division)	7 % 2	1
**	Exponentiation (power)	3 ** 2	9

Example Program

```
# Arithmetic operations on integer and float variables
a = 10
b = 3
print("Addition:", a + b)
print("Subtraction:", a - b)
print("Multiplication:", a * b)
print("Division:", a / b)
print("Floor Division:", a // b)
print("Remainder:", a % b)
print("Power:", a ** b)
```

Output
Addition: 13
Subtraction: 7
Multiplication: 30
Division: 3.3333333333333335
Floor Division: 3
Remainder: 1
Power: 1000

Explanation

+, -, *, / are the basic arithmetic operators used with both integers and real numbers.
// divides two numbers but keeps only the integer part of the result.
% gives the remainder of the division.
** is used to calculate powers (for example, 2 ** 3 means 2 to the power of 3 = 8).

Exercise

Write a Python program that reads a duration in seconds, then calculates and displays how many hours, minutes, and seconds it represents. The result should be shown in the following format: Nh : Nm : Ns

```
# Read the number of seconds
Seconds = int(input("Enter the number of seconds: "))
# Calculate hours, minutes, and seconds
Nh = Seconds // 3600
Nm = (Seconds % 3600) // 60
Ns = Seconds % 60   # Method 1
# Alternative method for seconds:
# Ns = Seconds % 3600 % 60   # Method 2
# Display the result
print(Nh, ":", Nm, ":", Ns)
```

Example
Enter the number of seconds: 3750
Output
1 : 2 : 30
