Practical No 9

Aim

Design a Python program to compute the factorial of a given integer N.

Apparatus / Software Required

- Python Interpreter (Python 3.14.2)

Theory

Factorial

1. The factorial of a non-negative integer N is the multiplication of all positive integers from 1 to N.
2. It is represented using the symbol !.

$$N! = N \times (N-1) \times (N-2) \times \cdots \times 1$$

Examples of Factorial

- 5! = 5 × 4 × 3 × 2 × 1 = 120

Concepts Used in This Practical

1. Input Function

Used to accept value from the user.
Syntax: variable = input("message")
Example: n = input("Enter a number: ")

2. int() Function

Used to convert input into integer.
Syntax: int(value)
Example: n = int(input("Enter a number: "))

3. Conditional Statements

Used to check conditions such as negative numbers and zero.

Syntax:

```
if condition:
  statement
elif condition:
  statement
else:
  statement
```

Example:

```
if n < 0:
  print("Invalid number")
elif n == 0:
  print("Factorial is 1")
```

4. Loop (for loop)

Used to repeat multiplication from 1 to N.

Syntax:

```
for variable in range(start, stop):
  statements
```

Example:

```
for i in range(1, n+1):
  fact = fact * i
```

5. Factorial Logic

- Initialize factorial variable as 1
- Multiply numbers from 1 to N using a loop.

Algorithm

1. **Start** the program.
2. **Input** a number from the user and store it in variable `num`.
3. **Initialize** a variable `fact` and assign value `1`.
4. **Check** if `num > 0`.
5. **Multiply** `fact = fact * num`.
6. **Decrement** the value of `num` by 1 (`num = num - 1`).
7. **Repeat** steps 4 to 6 until `num` becomes `0`.
8. **Display** the value of `fact` as the factorial of the number.
9. **Stop** the program.
10. **End**

Program Code

Output

Conclusion