

In this lab, you will learn to write recursive functions in C.

The basic objectives are:

- (1) Understand recursion.
- (2) Implement a recurrence relation as a recursive function in C.
- (3) Compare recursive programs with their non-recursive equivalents.

**Task 1: Write factorial program using recursion. Write another factorial program which does not use recursion. Which one do you like? Why?**

Input: 5.

Output:  $5! = 5 * 4 * 3 * 2 * 1 = 120$ .

**Task 2: Print the following series using a C program. Series: 1,2,4,7,12,...<print upto 200 items>**

Hint: This series can be described using a recurrence relation  $F_n = F_{n-1} + F_{n-2} + 1$

**Task 3: Given the relation  $F_n = 3F_{n-1} + 2$  with initial condition  $F_0 = 1$ , write a C program to print this series.**

**Task 4: What is the value of fun(5)?**

```
int fun (int n)
{
    int x=1, k;
    if (n==1) return x;
    for (k=1; k<n; ++k)
        x = ++x + fun(k) * fun(n-k);
    return x;
}
```