# LAB 5

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**Write program using recursion for factorial, fibonacci and tower of Hanoi**

```
//Fibonacci
#include <stdio.h>
int fibonacci(int n) {
    if (n <= 1) {
        return n;
    }
    return fibonacci(n - 1) + fibonacci(n - 2);
}

void main() {
    int n, i;
    printf("Enter Number of Terms in Fibonacci series: ");
    scanf("%d", &n);
    printf("Fibonacci Series: ");
    for (i = 0; i < n; i++) {
        printf("%d ", fibonacci(i));
    }
}
```

```
//Factorial
```

```
#include <stdio.h>
int factorial(int n)
{
   if (n<=1)
   {
      return 1;
   }
   return n * factorial(n - 1);
}

void main()
{
   int num;
   printf("Enter Number to Calculate Factorial: ");
   scanf("%d", &num);
   if (num < 0)
   {
      printf("Factorial Not Possible\n");
   }
   else
   {
      printf("Factorial of %d is %d\n", num, factorial(num));
   }
}

//Tower of Hanoi
#include <stdio.h>
void TOH(int n, char s, char t, char d)
{
   if (n == 1)
```

```
    {
        printf("Move Disk %d from %c to %c\n", n, s, d);
        return;
    }
    TOH(n - 1, s, d, t);
    printf("Move disk %d from %c to %c\n", n, s, d);
    TOH(n - 1, t, s, d);
}

void main()
{
    int n = 3;
    TOH(n, 'S', 'T', 'D');
}
```

**Output:**

```
Enter number:5
Factorial of 5: 120
Fibbonacci of 5: 0
1
1
2
3
Enter number:3
Move disk 1 from rod A to rod C
Move disk 2 from rod A to rod B
Move disk 1 from rod C to rod B
Move disk 3 from rod A to rod C
Move disk 1 from rod B to rod A
Move disk 2 from rod B to rod C
Move disk 1 from rod A to rod C

Process returned 0 (0x0)   execution time : 2.500 s
Press any key to continue.
```