Recursion

The process in which a function calls itself directly or indirectly is called recursion and the corresponding function is called as recursive function. Using recursive algorithm, certain problems can be solved quite easily. Examples of such problems are Towers of Hanoi (TOH), Inorder/Preorder/Postorder Tree Traversals, DFS of Graph, etc.

To solve a problem, solve a subproblem that is a smaller instance of the same problem, and then use the solution to that smaller instance to solve the original problem.

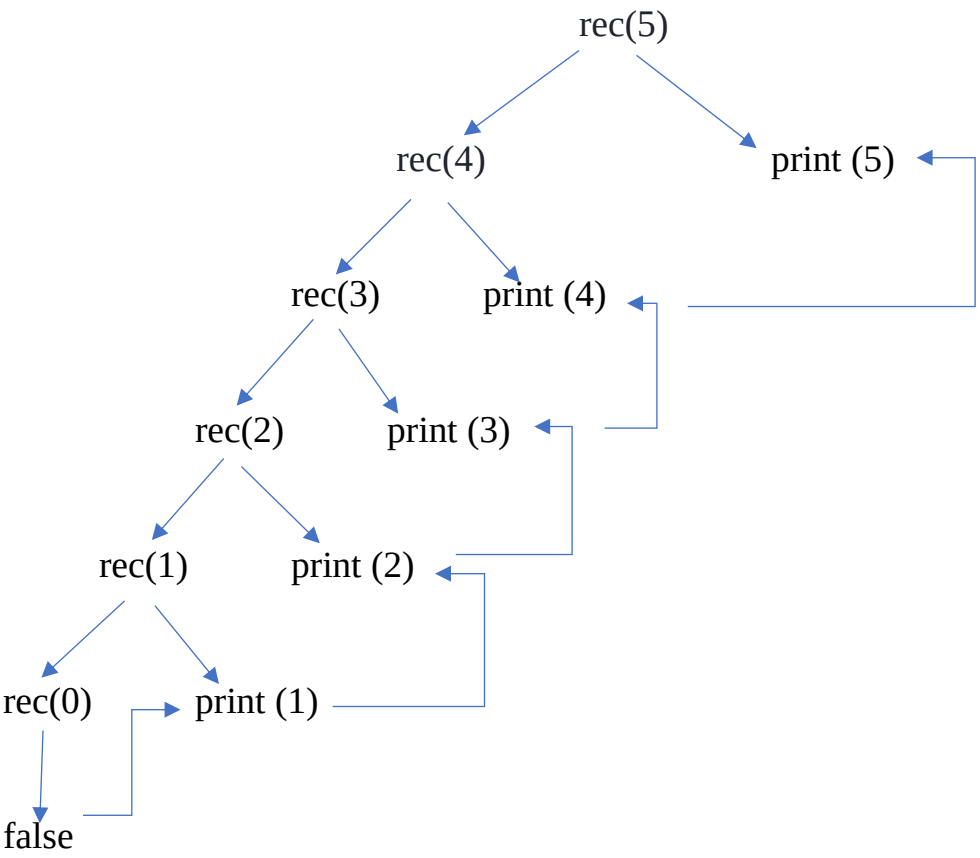
```c
#include<stdio.h>

int rec(int x);
int main()
{
    int i=5;
    rec(5);

    return 0;
}

int rec(int x)
{
    if(x>0)
    {
        rec(x-1);
        printf(" %d ", x);
    }

    return 0;
}
```


rec(5)
rec(4)
print (5)
rec(3)
print (4)
rec(2)
print (3)
rec(1)
print (2)
rec(0)
print (1)
false

Ans: 1 2 3 4 5

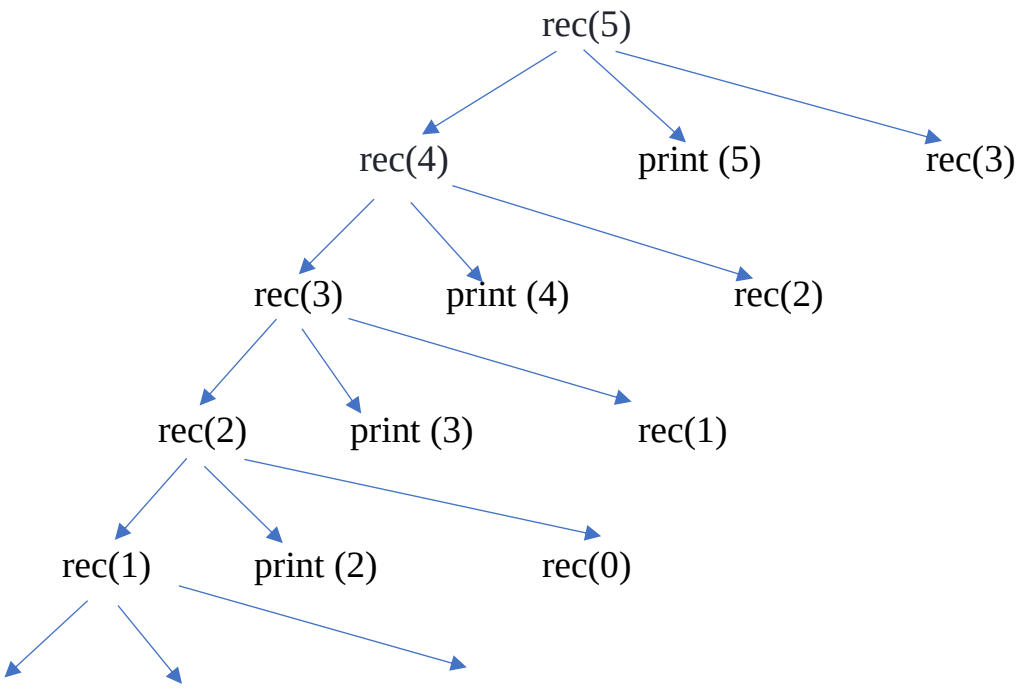
```c
#include<stdio.h>

int rec(int x);
int main()
{
    int i=5;
    rec(5);

    return 0;
}

int rec(int x)
{
    if(x>0)
    {
        rec(x-1);
        printf(" %d ", x);
        rec(x-2);
    }

    return 0;
}
```



rec(0) print (1) rec(-1)

false false

Ans: 1 2 3 1 4 1 2 5 1 2 3 1

For Practice: Factorial and Fibonacci Series by using recursion

Fibonacci Series: 0 1 1 2 3 5 8 13 …