Laboratory Component 5:

Develop a Program in C for the following Stack Application:

b. **Solving Tower of Hanoi problem with n disks**

```
#include<stdio.h>
#include<math.h>

void tower(int n, char srcpeg,  char auxpeg, char destnpeg);

void main()
{
        int n;
        printf("\nEnter the number of disks: ");
        scanf("%d", &n);
        tower(n, 'A', 'B', 'C');

      // A-> source peg   B->aux peg   C->destination peg

       printf("\nTotal number of moves = %0.0f", pow(2,n)-1 );
}

void tower(int n, char srcpeg,  char auxpeg, char destnpeg)
{
        if(n == 1)
        {
                printf("\nMove disk %d from peg %c  to %c peg", n,  srcpeg,  destnpeg);
                return;
        }

        // move n-1 disks from A(from_peg) to B(to_peg) using C(aux_peg) as auxiliary
        tower(n-1, srcpeg,  destnpeg,  auxpeg);

        printf("\nMove disk %d from peg %c to %c peg", n, srcpeg,  destnpeg);

        // move n-1 disks from B(aux_peg) to C(to_peg) using A(from_peg) as auxiliary
        tower(n-1, auxpeg, srcpeg, destnpeg);
}
```

Output:

Enter the number of disks: **3**

Move disk 1 from A peg to C peg
Move disk 2 from peg A to B peg
Move disk 1 from C peg to B peg
Move disk 3 from peg A to C peg
Move disk 1 from B peg to A peg
Move disk 2 from peg B to C peg
Move disk 1 from A peg to C peg

Total number of moves = **7**