RECURSSION PROGRAM A) TOWER OF HANOI B) GCD

A)

TOWER OF HANOI PROGRAM:-

```c
#include <stdio.h>

void towers(int, char, char, char);

int main()
{
    int num;

    printf("Enter the number of disks : ");
    scanf("%d", &num);
    printf("The sequence of moves involved in the Tower of Hanoi are :\n");
    towers(num, 'A', 'C', 'B');
    return 0;
}
void towers(int num, char frompeg, char topeg, char auxpeg)
{
    if (num == 1)
    {
        printf("\n Move disk 1 from peg %c to peg %c", frompeg, topeg);
        return;
    }
    towers(num - 1, frompeg, auxpeg, topeg);
    printf("\n Move disk %d from peg %c to peg %c", num, frompeg, topeg);
    towers(num - 1, auxpeg, topeg, frompeg);
}
```

EXECUTION:-

```
Enter the number of disks : 3
The sequence of moves involved in the Tower of Hanoi are :

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

B)
GCD PROGRAM :-

```c
#include<stdio.h>

int findGCD(int num1,int num2);
int main()
{
  int num1,num2,gcd;
  printf("\n\n Recursion : Find GCD of two numbers :\n");
  printf("-----------------------------------------\n");
  printf(" Input 1st number: ");
  scanf("%d",&num1);
  printf(" Input 2nd number: ");
  scanf("%d",&num2);

  gcd = findGCD(num1,num2);
  printf("\n The GCD of %d and %d is: %d\n\n",num1,num2,gcd);
  return 0;
}

int findGCD(int a,int b)
{
     while(a!=b)
     {
          if(a>b)
              return findGCD(a-b,b);
          else
             return findGCD(a,b-a);
     }
     return a;
}
```

EXECUTION:-

```
 Recursion : Find GCD of two numbers :
-----------------------------------------
 Input 1st number: 50
 Input 2nd number: 10

 The GCD of 50 and 10 is: 10
```