Write the following program using recursion.

i. GCD between two numbers.
ii. Reverse of a number.
iii. Sum of digits.
iv. Fibonacci series.
v. Tower of Hanoi.

Program –

(i) GCD between two numbers:

```
#include<stdio.h>
int gcd(int a,int b)
{
    if(a==0)
    {
        return b;
    }
    else if(b==0)
    {
        return a;
    }
    else if (a>b)
    {
        return gcd(a%b,b);
    }
    else
    {
        return gcd(a,b%a);
    }
}
int main()
{
    int a,b;
    printf("Enter two integer values: ");
    scanf("%d%d",&a,&b);
    printf("GCD of %d and %d is %d",a,b,gcd(a,b));
    return 0;
}
```

(ii) Reverse of a number:

```
#include<stdio.h>
int reverse(int a)
{
    static int r=0,b=1;
    if(a>0)
    {
        reverse(a/10);
        r+=(a%10)*b;
        b*=10;
    }
    return r;

}
int main()
{
    int a;
    printf("Enter any integer number: ");
    scanf("%d",&a);
    printf("Reverse of %d is %d\n",a,reverse(a));
    return 0;
}
```

(iii) Sum of the digits:

```
#include <stdio.h>

int sum_of_digit(int n)
{
     if (n == 0)
          return 0;
     return (n % 10 + sum_of_digit(n / 10));
}

int main()
{
     int num;
     printf("Enter any integer number: ");
    scanf("%d",&num);
     int result = sum_of_digit(num);
```

```
    printf("Sum of digits in %d is %d\n", num, result);
    return 0;
}
```

(iv) Fibonacci Series:

```
#include<stdio.h>
int fibonacci(int n)
{
    if(n==0 || n==1)
    {
        return n;
    }
    else
    {
        return (fibonacci(n-1)+fibonacci(n-2));
    }
}
int main()
{
    int n,i,m=0;
    printf("Enter the value of N: ");
    scanf("%d",&n);
    if(n<=0)
    {
        printf("Invalid!\n");
    }
    else
    {
        printf("The series is as follows: ");
        for(i=1;i<=n;i++)
        {
            printf("%d ",fibonacci(m));
            m++;
        }
    }
    return 0;
}
```

(v) Tower of Hanoi:

```
#include <stdio.h>
int main()
{
     int n; // Variable declaration
     void tower(int, char, char, char); // function
declaration
     printf("\nHow many disks ? ");
     scanf("%d",&n);
     if(n>0)
          tower(n,'S','A','D'); //function call
     else
          printf("\n Do not waste time, Press any key to
exit");
     return(0);
}
void tower(int n, char beg, char aux, char end)
{
     if(n==1)
     {
          printf("\nMove Disk %d from peg %c to peg
%c\n", n, beg, end);
          return;
     }
     tower(n-1,beg,end,aux);
     printf("\nMove Disk %d from peg %c to peg %c\n", n,
beg, end);
     tower(n-1,aux,beg,end);
}
```