1BM17CS050

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ADA Lab Test

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16CS5BCADA

1) Write a recursive function

a) to find GCD

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

b) original program to find tower of Hanoi using recursive function.

```
#include <stdlib.h>
#include <stdio.h>
void hanoi (int n, char x, char y, char z);
{
  if (n==1)
  {
    cout <<"Move disk 1 from rod " << x << "to rod " <<y;
    return;
  }
  hanoi ( n-1 , x , z , y);
  cout<<" Move disk " << n << " from rod " << x << "to rod " << y;
  hanoi ( n-1, z, y, x);
}
void main ( )
{ int n;
  printf (" Enter number of disks ";
  scanf ("%d", &n);
  Hanoi ( n, 'a', 'c', 'b' );
}
```

b) modified program: count number of recursive calling in the tower of Hanoi problem.

```
#include <stdlib.h>
#include < stdio.h>
void hanoi (int n, char x, char y, char z, int count)
{ if (n==1)
  { count++;
    cout << "Move disk from rod " << x << " to rod " << y;
    return;
```

```
Void hanoi( int n, char x, char y, char z, int count)
{
    if(n==1)
    printf("Error");
    else
    hanoi(n-1, x, z, y)
    cout << "Move disk" << n << "from rod " << x << "to rod" << y;
    hanoi(n-1, z, y, x)
```

```
void hanoi( int n, char x, char y, char z, int count)
{ if (n==1)
  { printf("Move disk 1 from rod" << x << "to rod" << y;
    return;
    } count++; printf("The count of recursive call printed", count);
  hanoi(n-1, x, y, z, count);
  printf("move disk" << n << "from rod" << x << "to rod" << y;
  hanoi(n-1, z, y, x, count)
  printf("The count of recursive calls = %d", count);
  }
void main()
{
int n;
printf("Enter number of disks");
scanf("%d", &n);
hanoi(n, 'a', 'c', 'b', 0);
}
```