

IBM17C5050

N. Jayanth

ADA Lab Test

14/6/21

16CS5BCADA

~~Ques~~ 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.

b) #include <stdlib.h>

#include <stdio.h>

void hanoi (int n, char x, char y, char z) :

{

if (n == 1)

to rod 'd', 'b', 'y');

{ printf ("More disk 1 from rod 'd' to rod 'b'"); }

return;

}

hanoi (n-1, z, y, x);  
printf ("More disk %d from rod %d to rod %d", n, x, y);  
~~printf ("More disk %d from rod %d to rod %d", n, x, y);~~

hanoi (n-1, z, y, x);

}

void main ()

{ int n;

printf ("Enter number of disks ");

scanf ("%d", &n);

hanoi (n, "a", "b", "c");

}

b) modified program: Count number of recursive calls 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 ++;~~

~~{ printf ("More disk 1 from rod %d to rod %d", x, 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 " << z << endl;
```

```
        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 %d to rod %d", x, z);
```

```
        return;
```

```
        count++; printf("The count of recursive call is %d", count);
```

```
        hanoi(n-1, x, z, y);
```

```
        printf("Move disk %d from rod %d to rod %d", n, x, y);
```

```
        printf("Move disk %d from rod %d to rod %d", n, x, y);
```

```
        count++;
```

```
        hanoi(n-1, z, y, x);
```

```
        printf("The count of recursive call is %d", count);
```

```
        printf("The count of recursive call is %d", count);
```

```
}
```

```
void main()
```

```
{  
    int n;
```

```
    printf("Enter number of disks ");
```

```
    scanf("%d", &n);
```

```
    hanoi(n, 'a', 'b', 'c', 0);
```

```
}
```