Lab Assignment - 1

a. Addition of elements of an array.

```
#include<stdio.h>
int findSum(int a[], int n)
{
   if(n<=0)
     return 0;
   return(findSum(a,n-1)+a[n-1]);
}
int main()
{
   int a[]={1,2,3,4,9};
   int n=sizeof(a)/sizeof(a[0]);
   printf("%d",findSum(a,n));
   return 0;
}
```

Output:- 19

b. Factorial of a number

```
#include<stdio.h>
long factorial(int n)
{
   if(n==0)
     return 1;
   else
     return(n*factorial(n-1));
}
int main()
 {
    int number;
    long fact;
    printf("Enter a Number :  ");
    scanf("%d",&number);

    fact=factorial(number);
    printf("Factorial of %d is %1d",number,fact);
    return 0;
 }
```

Output:-

```
Enter a Number :  10
Factorial of 10 is 3628800
```

c. Addition of two non-negative integers.

```
#include<stdio.h>
int x;
int add (int m,int n)
{
   if(n==0)
     return m;

    x=add(m,n-1)+1;
    return x;
}
int main()
{
   int a,b,c;
   printf("Enter 2 Numbers:  ");
   scanf("%d%d",&a,&b);
   c=add(a,b);
    printf("sum of 2 Number is: %d ",c);
    return 0;
}
```

Output:-

```
Enter 2 Numbers:  23
34
sum of 2 Number is: 57
```

d. Multiplication of two non-negative integer.

```
#include <stdio.h>
int multrecur(int n, int m)
{
   if (n > 0 && m < 0) {
      return multrecur(m, n);
   }
   else if (n < 0 && m < 0) {
      return multrecur((-1 * n), (-1 * m));
   }
   if (n > m) {
      return multrecur(m, n);
   }
   else if (m != 0) {
      return n + multrecur(n, m - 1);
   }
   else {
      return 0;
   }
}
int main()
{
   int num1, num2;
   printf("Enter 2 No:-");
   scanf("%d %d" , &num1, &num2);
   printf("%d",multrecur(num1, num2));
}
```

Output:-

```
Enter 2 No:-2
5
10
```

e. GCD of two numbers.

```
#include<stdio.h>
#include<conio.h>
int GCD_Rec(int n1, int n2);
int main()
{
   int n1,n2;
   printf("Enter any 2 positive no:  ");
   scanf("%d%d",&n1,&n2);

   printf("GCD of two numbers %d and %d is %d",n1,n2,GCD_Rec(n1,n2));
   return 0;
}
int GCD_Rec(int n1,int n2)
{
   if(n2 !=0)
   {
    return  GCD_Rec(n2,n1 % n2);
   }
   else
   {
      return n1;
   }
}
```

Output:-

```
Enter any 2 positive no:  2
8
GCD of two numbers 2 and 8 is 2
```

f. Tower of Hanoi Problem.

```
#include<stdio.h>
void TOH(int,char,char,char);
int main()
{
int n;
  printf("How many plates?");
  scanf("%d",&n);
  TOH(n,'A','B','C');
}
void TOH(int n,char x,char y,char z)
{
  if(n>0)
{
  TOH(n-1,x,z,y);
  printf("\n%c -> %c",x,y);
  TOH(n-1,z,y,x);
}
}
```

Output:-

```
How many plates?3
A -> B
A -> C
B -> C
A -> B
C -> A
C -> B
A -> B
```