ASSIGNMENT - 13

1. Write a recursive function to calculate sum of first N natural numbers.

```
#include<stdio.h>
int sum(int);
int main()
{
    int n;
    Printf("Enter a Number:");
    Scanf("%d", &n);
    Printf("%d", sum(n));
    return 0;
}
int sum(int(n);
{
    if (n==0)
        return 1;
        int S = 0;
        S = n+sum(n-1);
        return S;
}
```

2. Write a recursive function to calculate sum of first N odd natural numbers.

```
#include<stdio.h>
int sum of odd(int);
int main()
{
    int n;
    Printf("Enter a Number:");
    Scanf("%d", &n);
    Printf("Sum is %d", sum of odd(n));
    return 0;
}
int sum of odd(int n)
{
```

n = 5
1, 3, 5, 7, 9
= 25

```
int s = 0;
if (n == 0)
return ;
s = 2 * n - 1 + sum of odd (n-1);
return s;
}
```

3. Write a recursive function to calculate sum of first N ~~odd~~ even natural numbers.

n = 5

2, 4, 6, 8, 10

30

```
#include <stdio.h>
int sum of even (int);
int main()
{
    int n;
    printf("Enter a Number: ");
    scanf("%d", &n);
    printf("Sum is %d", sum of even (n-1));
    return 0;
}
int sum of even (int n)
{
    int s = 0;
    if (n == 0)
    return ;
    s = 2 * n + sum of even (n-1);
    return s;
}
```

n = 5

1 + 4 + 9 + 16 + 25

= 55

4. Write a recursive function to calculate sum of squares of first n natural numbers.

```
#include <stdio.h>
int sum of square (int);
int main()
{
    int n;
```

n = 5

1 + 4 + 9 + 16 + 25

= 55

```
Printf("Enter a Number:");
scanf("%d", &n);
Printf("Sum is %d", sum of square(n);
return 0;
}
int sum of square (int n)
{
    int s=0;
    if (n==0)
    return 0;
    s = n*n + sum of square (n-1);
    return s;
}
```

5. Write a recursive function to calculate sum of digits of a given number.

```
#include<stdio.h>
int sum of digit (int);
int main ()
{
    int x;
    Printf ("Enter a Number:");
    scanf("%d", &x);
    Printf ("Sum is %d", sum of digit(x);
    return 0;
}
int sum of digit (int y)
{
    int s=0;
    if (y==0)
    return ;
    return sum of digit (y/10) + y%10;
}
```

6. Write a recursive function to calculate factorial of a given number.

```
#include <stdio.h>
int factorial (int);
int main()
{
    int x;
    Printf(" Enter a Number: ");
    int main;
    {
      int x;
      Printf(" Enter a Number");
      Scanf(" %d ", &x);
      Printf(" factorial is %d", factorial(x);
      return 0;
    }
    int ~~main~~ factorial ( int y )
    {
        int fact = 1;
        if (y==1)
          return 1;
        return fact * factorial (y-1);
    }
```

7. Write a recursive function to calculate HCF of two numbers

```
#include <stdio.h>
int hcf ( int, int);
int main()
{
  int ~~main~~ num1, num2;
  Printf(" Enter Two numbers ");
  Scanf("%d %d ", &num1, &num2);
  Printf(" HCF of %d and %d is %d ",
        num1, num2, hcf(n1, n2));
  return 0;
}
```

8.

9.

```
int hcf (int x, int y)
{
  if (y != 0)
  return hcf (y, x % y);
  else
  return x;
}
```

8. Write a recursive function to print first N terms of Fibonacci series.

```
#include <stdio.h>
int fib (int);
int main ()
{
   int n, i;
   Printf ("Enter Number");
   Scanf ("%d", &n);
   for (i=0; i<n; i++)
   Printf ("%d", fib (i));
   return 0;
}
int fib (int n);
{
 if (n==1) (n==0)
 return n;
 return fib (n-1) + fib (n-2);
}
```

9. Write a program in C to Count the digits of a given number using recursion.

```
#include <stdio.h>
int Count digit (int);
int main ()
{
   int x;
```

```
Printf (" Enter a number");
Scanf ("%d", &x);
Printf (" Number of digit is %d", Countdigit
return 0;
}
int Count digit (int x)
{
    int Count = 0;
    if (x == 0)
     return x;
      Count digit + (x % 10);
       Count ++;
       Count digit (x/10);
        return Count;
}
```