Assignment (13)

① Write a ~~program~~ recursive function to calculate sum of first N natural Numbers.

```
#include<Stdio.h>
int Sum(int n);
int main()
{
    int n, x;
    Printf("Enter any number");
    scanf("%d", &n);
    Printf("Sum of first %d natural number are ", n);
    x = Sum(n);
    Printf("%d", x);
}
int Sum(int a)
{
    int s;
    if(a>=1)
    {
      s=a+Sum(a-1);
      return(s);
    }
}
```

② Write a recursive function to Calculate Sum of first N odd natural numbers.

```
#include<Stdio.h>
int ~~main~~Sum(int N);
int main()
{
    int n, x;
    Printf("Enter any number");
    Scanf("%d", &n);
    Printf("Sum is first %d odd natural numbers are: ", n);
    x = sum(n);
    Printf("%d", x);
}
    int Sum(int N)
{
    if(N>=1)
    {
    return(2*N-1+Sum(N-1));
    return(s);
}
}
```

③ Write a recursive function to calculate Sum of first N even natural number

```
#include<stdio.h>
int sum (int);
int main()
{
  int n, x;
  Printf ("Enter any number");
  Scanf ("%d", &n);
 Printf ("Sum is first %d even natural number are : ", n);
  x = sum (n);
  Printf("%d", n);
}
  int sum (int a)
  {
    int s;
    if (a>=1)
    {
     return (2*a + sum (a-1));
     return (s);
  }
}
```

④ write a recursive function to calculate sum of squares of first n natural num

```
#include<stdio.h>
int sum (int);
int main()
{
  int n, x;
Printf ("Enter any number");
Scanf ("%d", &n);
Printf ("Sum is first %d natural number are", n);
x = sum (n);
Printf("%d", x);
}
 int sum(int a)
 {
  int s;
  if(a>=1)
  {return (a*a+sum (a-1));
  return(s);
 }
}
```

```
#include<stdio.h>
int sum (int);
int main()
{
Printf("%d", sum(10));
}
 int sum (int N)
 {
  if( N==1)
  return (1);
 return (N*N + sum (N-1));
}
```

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

```
#include<stdio.h>
int sum of digits(int num);
int main()
{
    int num,Sum;
    Printf("Enter any number to find Sum of digits : ");
    Scanf("%d", &num);
    Sum = sum of digits(num);
    Printf("Sum of digits of %d = %d", num, sum);
}
int Sum of digits (int num)
{   int S;
    if(num==0)
     return 0;
    return (num%10) + Sum of digits (num/10));
     return (S);
}
```

⑥ write a recursive function to calculate ~~sum of digits~~ factorial of a given number.

```
#include<stdio.h>
int factorial (int);
int main()
{
  int num;
  Printf("Enter a factorial of a given number \n");
  Scanf("%d", &num);
  Printf("\n factorial of %d is %d \n", num, factorial (num));
}
   int factorial (int num)
   {
      int S;
      return((num>0) ? (num* factorial (num-1)) : 1);
      if(num)
       return (num * factorial (num-1));
      else
       return (S);
   }
```

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

```
#include<stdio.h>
int HCF(int n1, int n2);
{
  if(n2 != 0)
    return HCF(n2, n1%n2);
  else
    return n1;
}
int main()
{
  int n1 = 15, n2 = 35;
  Printf("H.C.F of %d and %d is %d", n1, n2, HCF(n1, n2));
  return 0;
}
```

⑧ write a recursive function to print first N terms of fibonacci Series

```
#include<stdio.h>
int fib(int N);
int main()
{
  int n, r;
  Printf("Enter any number");
  Scanf("%d", &n);
  Printf("%d term of fibonacci Series is", n);
  r = fib(n);
  Printf("%d", r);
}
int fib(int a)
{
  int s;
  if(a==0)
  return 0;
  if(a==1)
  return 1;
  else
  return (fib(a-1)+fib(a-2));
  return (s);
}
```

⑨ write a program in C to count the digits of a given number using recursion.

→
```
#include<stdio.h>
int no.of digit (int n1);
int main()
{
  int n1, n2;
  Printf ("\n\n count the digits of a given number:\n");

  Printf ("Input a number");
  scanf ("%d", &n1);
  n2 = no.of digits (n1);
  Printf ("The number of digits in the number is : %d \n\n", n2);
  return 0;
}
int no.of digits (int n1)
{ static int n2 = 0;
  if (n1 != 0)
  {
    n2++;
    no.of digits (n1/10);
  }
  return n2;
}
```

⑩ write a program in c to calculate the power of any number using recursion.

```
#include<stdio.h>
int power(int n1, int n2);
int main()
{
  int base, a, result;
  Printf("Enter basenumber:");
  scanf ("%d", &base);
  Printf ("Enter power number (positive integer):");
  Scanf("%d", &a);
```

```
    result = power(base, a);
    printf("%d ^ %d = %d", base, a, result);
    result 0;
}
  int power (int base, int a)
{
    if(a != 0)
      return (base * power (base, a-1));
    else
      return 1;
}
```