Assignment – 13

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

```c
#include<stdio.h>
int sum(int n)
{
    if(n==1)
        return 1;
    else
        return n+sum(n-1);
}
int main()
{
    int n;
    printf("Enter number :");
    scanf("%d",&n);
    printf("Sum of first %d natural number is : %d",n,sum(n));
    return 0;
}
```

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

```c
#include<stdio.h>
int sum(int n)
{
    if(n==1)
        return 1;
    else if(n%2==1)
        return n+sum(n-1);
    else
        return sum(n-1);
}
int main()
{
    int n;
    printf("Enter number :");
    scanf("%d",&n);
    printf("Sum of first %d odd natural number is : %d",n,sum(2*n));
    return 0;
}
```

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

```c
#include<stdio.h>
int sum(int n)
{
    if(n==0)
        return 0;
    else if(n%2==0)
        return n+sum(n-1);
    else
        return sum(n-1);
}
```

```c
int main()
{
    int n;
    printf("Enter number :");
    scanf("%d",&n);
    printf("Sum of first %d even natural number is : %d",n,sum(2*n));
    return 0;
}
```

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

```c
#include<stdio.h>
int sum(int n)
{
    if(n==1)
        return 1;
    else
        return n*n+sum(n-1);
}
int main()
{
    int n;
    printf("Enter number :");
    scanf("%d",&n);
    printf("Sum squares of first %d natural number is : %d",n,sum(n));
    return 0;
}
```

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

```c
#include<stdio.h>
int sum(int n)
{
    if(n==0)
        return 0;
    else
        return (n%10)+(sum(n/10));
}
int main()
{
    int n;
    printf("Enter number :");
    scanf("%d",&n);
    printf("Sum of digits of given number is : %d",sum(n));
    return 0;
}
```

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

```c
#include<stdio.h>
int fact(int n)
{
    if(n==1)
        return 1;
    else
```

```
        return n*fact(n-1);
}
int main()
{
    int n;
    printf("Enter number :");
    scanf("%d",&n);
    printf("Factorial of %d is : %d",n,fact(n));
    return 0;
}
```

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

```
#include<stdio.h>
int hcf(int a,int b)
{
    if(b==0)
        return a;
    else if(a>b)
        return hcf(b,a%b);
    else
        return hcf(a,b%a);
}
int main()
{
    int a,b;
    printf("Enter two numbers : ");
    scanf("%d%d",&a,&b);
    printf("HCF of %d and %d is : %d",a,b,hcf(a,b));
    return 0;
}
```

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

```
#include<stdio.h>
int n;
int fib(int a,int b)
{
    int temp=0;
    if(n==0)
        return 0;
    else
    {
        printf("%d ",a);
        n--;
        temp=a+b;
        a=b;
        b=temp;
        return fib(a,b);
    }
}
int main()
{
    printf("Enter number : ");
    scanf("%d",&n);
```

```
    printf("First %d term of fibonacci series : ",n);
    fib(0,1);
    return 0;
}
```

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

```
#include<stdio.h>
int num;
int count(int n)
{
    if(n==0)
        return num;
    else
    {
        num++;
        return count(n/10);
    }
}
int main()
{
    int n;
    printf("Enter number : ");
    scanf("%d",&n);
    printf("Number of digits in given number is : %d",count(n));
    return 0;
}
```

10. Write a program in C to calculate the power of any number using recursion.

```
#include<stdio.h>
int power(int a,int b)
{
    if(b==1)
        return a;
    else
        return a*power(a,b-1);
}
int main()
{
    int a,b;
    printf("Enter number :");
    scanf("%d",&a);
    printf("Enter power of number :");
    scanf("%d",&b);
    printf("%d Power of %d is : %d",b,a,power(a,b));
    return 0;
}
```