Assignment - 13 A Job Ready Bootcamp in C++, DSA and IOT

More on Recursion in C Language

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

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

   return (n + sumN(n-1));
}
int main()
{
   int x;
   printf("Enter a number ");
   scanf("%d",&x);

   printf("Sum of %d natural numbers is %d ",x,sumN(x));
   return 0;
}
```

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

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

   return ((2*n-1) + sumNodd(n-1));
}
int main()
{
   int x;
   printf("Enter a number ");
   scanf("%d",&x);

   printf("Sum of %d Odd natural numbers is %d ",x,sumNodd(x));
   return 0;
}
```

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

```
#include<stdio.h>
int sumNeven(int n)
{
  if(n==1)
     return n+1;

   return ((2*n) + sumNeven(n-1));
}
int main()
{
   int x;
   printf("Enter a number ");
   scanf("%d",&x);

   printf("Sum of %d Odd natural numbers is %d ",x,sumNeven(x));
   return 0;
}
```

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

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

   return ((n*n) + sumNsquare(n-1));
}
int main()
{
   int x;
   printf("Enter a number ");
   scanf("%d",&x);

   printf("Sum of %d Odd natural numbers is %d ",x,sumNsquare(x));
   return 0;
}
```

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

```
#include<stdio.h>
int sumDigit(int n)
{
   int rem;
   rem=n%10;
```

```
    n=n/10;

    if(n==0)
      return rem;

    return (rem + sumDigit(n));
}
int main()
{
    int x;
    printf("Enter a number ");
    scanf("%d",&x);

    printf("Sum of %d Odd natural numbers is %d ",x,sumDigit(x));
    return 0;
}
```

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

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

    return (n * sumFact(n-1));
}
int main()
{
    int x;
    printf("Enter a number ");
    scanf("%d",&x);

    printf("Sum of %d Odd natural numbers is %d ",x,sumFact(x));
    return 0;
}
```

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

```
#include<stdio.h>
int HCF(int a,int b)
{
    while(a!=b)
    {
      if(a>b)
        return HCF(a-b,b);
```

```
        else
            return HCF(a,b-a);
    }
    return a;
}

int main()
{
    int x,y;
    printf("Enter two numbers ");
    scanf("%d%d",&x,&y);

    printf("\nHCF of %d and %d is %d",x,y,HCF(x,y));

    return 0;
}
```

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

```
#include<stdio.h>
void Fibo(int n)
{
    static int prev=0,cur=1,next=0;
    if(n>0)
    {
        next=prev+cur;
        prev=cur;
        cur=next;
        printf("%d ",next);
        Fibo(n-1);
    }
}

int main()
{
    int x;
    printf("Enter a number ");
    scanf("%d",&x);
    printf("\nFibonacci series is 0 1 ");
    Fibo(x-2);

    return 0;
}
```

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

```
#include<stdio.h>
int Digit(int n)
{
  static int rem,count=0;
   if(n>0)
   {
      rem=n%10;
      n=n/10;
      count++;
      Digit(n);
   }
   if(n==0)
      return count;
}
int main()
{
   int x;
   printf("Enter a number ");
   scanf("%d",&x);

   printf("%d ",Digit(x));
   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!=0)
      return(a* Power(a,b-1));
   else
      return 1;
}
int main()
{
   int x,y;
   printf("Enter base and power number ");
   scanf("%d%d",&x,&y);

   printf("\nPower is %d ",Power(x,y));
   return 0;
}
```