**More on Recursion in C Language**

**Assignment – 13**

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

**1.** **#include<stdio.h>**

**int sum(int);**

**int main()**

**{**

**int a;**

**printf("ENTER LIMIT OF NATURAL NO=");**

**scanf("%d",&a);**

**printf("SUM UPTO N TERMS ARE=%d",sum(a));**

**return 0;**

**}**

**int sum(int a)**

**{**

**if(a!=0)**

**return a+sum(a-1);**

**}**

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

**2.** **#include<stdio.h>**

**int sumodd(int);**

**int main()**

**{**

**int a;**

**printf("ENTER LIMIT OF ODD NO=");**

**scanf("%d",&a);**

**printf("\nSUM OF ODD UPTO N TERMS ARE=%d ",sumodd(a));**

**return 0;**

**}**

**int sumodd(int a)**

**{**

**if(a>0)**

**{**

**printf("%d ",2\*a-1);**

**return a\*2-1+sumodd(a-1);**

**}**

**}**

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

**3.** **#include<stdio.h>**

**int sumeven(int);**

**int main()**

**{**

**int a;**

**printf("ENTER LIMIT OF even NO=");**

**scanf("%d",&a);**

**printf("\nSUM OF even UPTO N TERMS ARE=%d ",sumeven(a));**

**return 0;**

**}**

**int sumeven(int a)**

**{**

**if(a>0)**

**{**

**printf("%d ",2\*a);**

**return a\*2+sumeven(a-1);**

**}**

**}**

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

**4.** **#include<stdio.h>**

**int sumeven(int);**

**int main()**

**{**

**int a;**

**printf("ENTER A LIMIT FOR NATURAL NO NO=");**

**scanf("%d",&a);**

**printf("\nSUM OF SQ UPTO N NATURAL ARE=%d ",sumeven(a));**

**return 0;**

**}**

**int sumeven(int a)**

**{**

**if(a>0)**

**{**

**printf("%d ",a\*a);**

**return a\*a+sumeven(a-1);**

**}**

**}**

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

**5.** **#include<stdio.h>**

**int digit(int);**

**int main()**

**{**

**int a,n;**

**printf("ENTER VALUE FOR N DIGIT NO= ");**

**scanf("%d",&n);**

**printf("ENTER VALUE FOR N DIGIT NO= ");**

**for(int i=0;i<n;i++)**

**{**

**scanf("%d",&a);**

**}**

**printf("SUM OF ENTERED DIGIT IS=%d",digit(a));**

**return 0;**

**}**

**int digit(int a)**

**{**

**if(a>1)**

**return a+digit(a-1);**

**}**

Write a recursive function to calculate factorial of a given number

**6.** **#include<stdio.h>**

**int fact(int);**

**int main()**

**{**

**int a;**

**printf("ENTER A VALUE FOR FACTORIAL NO=");**

**scanf("%d",&a);**

**printf("\nFACTORIAL ARE=%d ",fact(a));**

**return 0;**

**}**

**int fact(int a)**

**{**

**if(a>1)**

**{**

**printf("%d ",a);**

**return a\*fact(a-1);**

**}**

**}**

Write a recursive function to calculate HCF of two numbers

**7.** **#include<stdio.h>**

**int hcf(int,int);**

**int main()**

**{**

**int a,b;**

**printf("ENTER FIRST=");**

**scanf("%d",&a);**

**printf("ENTER SECOND=");**

**scanf("%d",&b);**

**printf("\nHCF OF %d and %d= %d ",a,b,hcf(a,b));**

**return 0;**

**}**

**int hcf(int a, int b) {**

**if (b!=0)**

**return hcf(b,a%b);**

**else**

**return a;**

**}**

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

9. **#include <stdio.h>**

**int countdigits(int);**

**int main()**

**{**

**int num;**

**printf("Enter a number: ");**

**scanf("%d", &num);**

**int sum = countdigits(num);**

**printf("Sum of digits of %d is %d", num, sum);**

**return 0;**

**}**

**int countdigits(int n)**

**{**

**if(n==0)**

**return 0;**

**return 1+countdigits(n/10);**

**}**

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

**10.** **#include <stdio.h>**

**int power(int n1, int n2);**

**int main()**

**{**

**int base, a, result;**

**printf("ENTER BASE NO=");**

**scanf("%d", &base);**

**printf("ENTER POWER NO(positive integer)= ");**

**scanf("%d", &a);**

**result = power(base, a);**

**printf("%d^%d = %d", base, a, result);**

**return 0;**

**}**

**int power(int base, int a)**

**{**

**if (a != 0)**

**return (base \* power(base, a - 1));**

**else**

**return 1;**

**}**