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

**More on Recursion in C Language**

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

#include<stdio.h>

int sumNatural(int);

int main()

{

int n;

printf("Enter a number : ");

scanf("%d",&n);

printf("The sum of %d Natural no is : %d ",n,sumNatural(n));

return 0;

}

int sumNatural(int x)

{

if(x==1)

return 1;

return (x + sumNatural(x-1));

}

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

#include<stdio.h>

int sum(int);

int main()

{

int n;

printf("Enter a number : ");

scanf("%d",&n);

printf("sum of first %d odd natural naumbers : %d ",n,sum(n));

return 0;

}

int sum(int x)

{

if(x==0)

return x;

return (2\*x-1+sum(x-1));

}

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

#include<stdio.h>

int sum(int);

int main()

{

int n;

printf("Enter a number : ");

scanf("%d",&n);

printf("sum of first %d even natural naumbers : %d ",n,sum(n));

return 0;

}

int sum(int x)

{

if(x==0)

return x;

return (2\*x+sum(x-1));

}

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

#include<stdio.h>

int sum(int);

int main()

{

int n;

printf("Enter a number : ");

scanf("%d",&n);

printf("sum of first %d odd natural naumbers : %d ",n,sum(n));

return 0;

}

int sum(int x)

{

if(x==0)

return x;

return (x\*x+sum(x-1));

}

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

#include<stdio.h>

int sum(int);

int main()

{

int n;

printf("Enter a number : ");

scanf("%d",&n);

printf("sum of digit of %d : %d ",n,sum(n));

return 0;

}

int sum(int x)

{

int res;

if(x==0)

return x;

else

res = sum(x/10)+(x%10);

return res;

}

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

#include<stdio.h>

int fact(int);

int main()

{

int n;

printf("Enter a number : ");

scanf("%d",&n);

printf("The factorial of %d is : %d ",n,fact(n));

return 0;

}

int fact(int x)

{

if(x== 0 || x == 1)

return 1;

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

}

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

#include<stdio.h>

int hcf(int,int);

int main()

{

int a,b,result;

printf("Enter two numbers:");

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

if(a>b)

result=hcf(b,a%b);

else

result=hcf(a,b%a);

printf("HCF of %d and %d = %d",a,b,result);

return 0;

}

int hcf(int a,int b)

{

if(b==0)

return a;

hcf(b,a%b);

}

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

#include<stdio.h>

int fib(int);

int main()

{

int x,i;

printf("Enter a number : ");

scanf("%d",&x);

for(i=0;i<x;i++)

{

printf("%d ",fib(i));

}

return 0;

}

int fib(int n)

{

int res;

if(n==0 || n==1)

return n;

return fib(n-1)+fib(n-2);

}

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

#include<stdio.h>

int countdigit(int);

int main()

{

int a,res;

printf("Enter a numbers:");

scanf("%d",&a);

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

return 0;

}

int countdigit(int x)

{

static int count = 0;

if(x!=0)

{

countdigit(x/10);

count++;

}

return count;

}

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

#include<stdio.h>

int power(int,int);

int main()

{

int a,b,res;

printf("Enter a numbers:");

scanf("%d",&a);

printf("Enter Power of numbers:");

scanf("%d",&b);

printf("Power of %d^%d = %d",a,b,power(a,b));

return 0;

}

int power(int num,int pow)

{

if(pow==0)

return 1;

return (num\*power(num,pow-1));

}