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

**More on Recursion in C Language**

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

#include<stdio.h>

int sum(int num);

int main()

{

    int num;

    printf("Enter the numbers:");

    scanf("%d",&num);

    printf("Sum of the natural numbers: %d is %d",num,sum(num));

}

int sum(int num)

{

    if(num!=0)

    return num+sum(num-1);

    else

    return num;

}

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

#include<stdio.h>

int odd(int start,int end);

int main()

{

    int start,end;

    printf("Enter the start value:");

    scanf("%d",&start);

    printf("Enter the end value:");

    scanf("%d",&end);

    printf("sum of the odd number %d is %d = %d\n",start,end,odd(start,end));

}

int odd(int start,int end)

{

    if(start>end)

    return 0;

    else

    return (start+odd(start+2,end));

}

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

#include<stdio.h>

int odd(int start,int end);

int main()

{

    int start,end;

    printf("Enter the start value:");

    scanf("%d",&start);

    printf("Enter the end value:");

    scanf("%d",&end);

    printf("sum of the odd number %d is %d = %d\n",start,end,odd(start,end));

}

int odd(int start,int end)

{

    if(start>end)

    return 0;

    else

    return (start+odd(start+2,end));

}

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

#include<stdio.h>

int sqaure(int num)

{

    if(num==0)

    return 0;

    else

    return ((num%10)\*(num%10)+sqaure(num/10));

}

int main()

{

    int num;

    printf("Enter the numbers:");

    scanf("%d",&num);

    printf("Sum of squares of digit %d = %d",num,sqaure(num));

}

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

#include<stdio.h>

int sum(int num);

int main()

{

    int num,result;

    printf("Enter the numbers:");

    scanf("%d",&num);

    result = sum(num);

    printf("Sum of the digit: %d",result);

}

int sum(int num)

{

    if(num==0)

    return 0;

    return (num%10+sum(num/10));

}

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

#include<stdio.h>

int fact(int n);

int main()

{

    int n,f;

    printf("Enter the numbers:");

    scanf("%d",&n);

    f = fact(n);

    printf("Factorial %d",f);

}

int fact(int n)

{

    if(n<=1)

    return 1;

    return n\*fact(n-1);

}

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

#include<stdio.h>

int hcf(int a,int b);

int main()

{

    int a,b;

    printf("Enter the first numbers:");

    scanf("%d",&a);

    printf("Enter the second numbers:");

    scanf("%d",&b);

    printf("Hcf is %d and %d = %d\n",a,b,hcf(a,b));

}

int hcf(int a,int b)

{

    if(b!=0)

    return hcf(b,a%b);

    else

    return a;

}

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

#include<stdio.h>

int fib(int n);

int main()

{

    int n,result;

    printf("Enter the numbers:");

    scanf("%d",&n);

    result = fib(n);

    printf("Fibonacci Series %d",result);

}

int fib(int n)

{

    if(n==0)

    {

        return 0;

    }

    else if(n==1)

    {

        return 1;

    }

    else

    return (fib(n-1)+fib(n-2));

}

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

#include<stdio.h>

int power(int ,int);

int main()

{

    int b,p,r;

    printf("Enter the Base:");

    scanf("%d",&b);

    printf("Enter the Power:");

    scanf("%d",&p);

    r = power(b,p);

    printf("Power is %d ^ %d = %d",b,p,r);

}

int power(int b,int p)

{

    if(p==0)

    return 1;

    else

    return b\*power(b,p-1);

}

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

#include<stdio.h>

int count(int n);

int main()

{

    int n,coun=0;

    printf("Enter the numbers:");

    scanf("%d",&n);

    coun = count(n);

    //result = count(n);

    printf("Count of the numbers: %d",coun);

}

int count(int n)

{

    static int coun=0;

    if(n>0)

    {

        coun++;

        count(n/10);

    }

    else

    {

        return coun;

    }

}