Q1: Write a recursive function to calculate sum of first N natural numbers

Answer:

#include<stdio.h>

int Naturalsum(int);

int main()

{

int input;

printf("Enter the Number to convert into binary: ");

scanf("%d",&input);

printf("Sum of this NAtural Number: %d",Naturalsum(input));

}

int Naturalsum(int n)

{

    int sum,a;

    if(n==0)

    {

        return 0;

    }

    sum=n+Naturalsum(n-1);

    return sum;

}

Q2: Write a recursive function to calculate sum of first N odd natural number

Answer:

#include<stdio.h>

int Naturaloddsum(int);

int main()

{

int input;

printf("Enter the Odd Number to convert into binary: ");

scanf("%d",&input);

input=2\*input-1;

printf("Sum of this Odd Natural Number: %d",Naturaloddsum(input));

}

int Naturaloddsum(int n)

{

    int sum;

    if(n==1)

    {

        return 1;

    }

    sum=n+Naturaloddsum(n-2);

    return sum;

}

Q4:Write a recursive function to calculate sum of squares of first n natural numbers

Answer:

#include<stdio.h>

int NaturalSquareSum(int);

int main()

{

int input;

printf("Enter the number: ");

scanf("%d",&input);

printf("Sum of the square is: %d",NaturalSquareSum(input));

}

int NaturalSquareSum(int n)

{

    int sum;

    if(n==1)

    {

        return 1;

    }

    sum=(n\*n)+NaturalSquareSum(n-1);

    return sum;

}

Q5: Write a recursive function to calculate sum of digits of a given number

Answer:

#include<stdio.h>

int SumOfDigit(int);

int main()

{

int input;

printf("Enter the Number: ");

scanf("%d",&input);

printf("Sum of Digit is: %d",SumOfDigit(input));

}

int SumOfDigit(int n)

{

    int sum;

    if(n/10==0)

    {

        return n%10;

    }

    sum=(n%10)+SumOfDigit(n/10);

    return sum;

}

Q6: Write a recursive function to calculate factorial of a given number

Answer:

#include<stdio.h>

int factorial(int);

int main()

{

int input;

printf("Enter the number: ");

scanf("%d",&input);

printf("Factorial is: %d",factorial(input));

}

int factorial(int n)

{

    int mul=1;

    if(n==1)

        return 1;

    mul=n\*factorial(n-1);

    return mul;

}

Q7: Write a recursive function to calculate HCF of two numbers

Answer:

#include<stdio.h>

int HCFS(int,int);

int main()

{

int input1,input2;

printf("Enter two number: ");

scanf("%d%d",&input1,&input2);

printf("HCF is: %d",HCFS(input1,input2));

}

int HCFS(int a,int b)

{

    int n,small,HCF;

    if(a<b)

        small=a;

    else

        small=b;

    for(n=2;n<=small;n++)

    {

        if(a%n==0 && b%n==0)

        {

            HCF=n\*HCFS(a/n,b/n);

            return HCF;

        }

    }

    return 1;

}

OR

You can solve using long division method as below:

#include<stdio.h>

int HCFS(int,int);

int main()

{

int input1,input2,a,b;

printf("Enter two number: ");

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

if(a<b)

{

    input1=a;

    input2=b;

}

else

{

    input1=b;

    input2=a;

}

printf("HCF is: %d",HCFS(input1,input2));

}

int HCFS(int a,int b)

{

    int remainder,n;

    if(b%a==0)

    {

        return a;

    }

    remainder=b%a;

    return HCFS(remainder,a);

}

Q8: Write a recursive function to print first N terms of Fibonacci series

Answer:

#include<stdio.h>

void fib(int,int,int);

int main()

{

    int x=0,y=1,n;

    printf("Enter a number: ");

    scanf("%d",&n);

    if(n>2)

    {

        printf("%d %d ",x,y);

        fib(x,y,n);

    }

    else

    {

        while(n<=2 && n>0)

        {

            printf("%d ",x );

            x++;

            n--;

        }

    }

}

void fib(int a,int b,int d)

{

    int c;

    if(d==2)

        return;

    c=a+b;

    a=b;

    b=c;

    printf("%d ",c);

    fib(a,b,d-1);

}

OR

#include<stdio.h>

int fib(int);

int main()

{

int n=5,i;

for(i=0;i<5;i++)

printf(“%d “,fib(i));

return 0;

}

int fib(int n)

{

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

return n;

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

}

Q9: Write a program in C to count the digits of a given number using recursion.

Answer:

#include<stdio.h>

int count(int);

int main()

{

    int Number;

    printf("ENter the Number: ");

    scanf("%d",&Number);

    printf("Total number of digit is: %d",count(Number));

}

int count(int n)

{

    int x;

    if(n==0)

        return 0;

    x=count(n/10);

    x++;

    return x;

}

Q10: Write a program in C to calculate the power of any number using recursion.

Answer:

#include<stdio.h>

int Power(int,int);

int main()

{

    int Number,pow;

    printf("Enter the Number: ");

    scanf("%d",&Number);

    printf("Enter the Power: ");

    scanf("%d",&pow);

    printf("Total number of digit is: %d",Power(Number,pow));

}

int Power(int a,int n)

{

    int x;

    if(n==0)

        return 1;

    a=a\*Power(a,n-1);

    return a;

}