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

#include <stdio.h>

int rec(int);

int main(int argc, char \*argv[])

{

    int num;

    printf("Enter number = ");

    scanf("%d", &num);

    printf("sum is = %d",rec(num));

    return 0;

}

int rec(int num)

{

    if (num == 1)

        return num;

    else

        return (num + rec(num - 1));

}

Q2.Write a recursive function to calculate sum of first N odd natural numbers

#include <stdio.h>

int rec(int num, int odd);

int main(int argc, char \*argv[])

{

    int num;

    printf("Enter number = ");

    scanf("%d", &num);

    printf("Sum is = %d", rec(num, 1));

    return 0;

}

int rec(int num, int odd)

{

    if (num == 1)

        return odd;

    else

    {

        odd = odd + rec(num-1, odd + 2);

        return odd;

    }

}

Q3.Write a recursive function to calculate sum of first N even natural numbers

#include <stdio.h>

int rec(int, int);

int main(int argc, char \*argv[])

{

    int num;

    printf("Enter number = ");

    scanf("%d", &num);

    printf("Sum is = %d",rec(num, 2));

    return 0;

}

int rec(int num, int even)

{

    if (num == 1)

        return even;

    else

    {

        even = even + rec(num - 1, even + 2);

        return even;

    }

}

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

#include <stdio.h>

int rec(int);

int main(int argc, char \*argv[])

{

    int num;

    printf("Enter number = ");

    scanf("%d", &num);

    printf("Sum  is = %d", rec(num));

    return 0;

}

int rec(int num)

{

    if (num == 1)

        return 1;

    else

        return ((num \* num) + rec(num - 1));

}

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

#include <stdio.h>

int rec(int);

int main(int argc, char \*argv[])

{

    printf("sum is = %d",rec(5));

    return 0;

}

int rec(int num)

{

    if (num == 1)

        return 1;

    else

        return (num + rec(num - 1));

}

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

#include <stdio.h>

int rec(int);

int main(int argc, char \*argv[])

{

    printf("factorial = %d",rec(5));

    return 0;

}

int rec(int num)

{

    if (num == 2)

        return 2;

    else

        return (num \* rec(num - 1));

}

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

#include <stdio.h>

void rec(int a, int b, int div, int ans);

int main(int argc, char \*argv[])

{

    int a, b;

    printf("Enter to number = ");

    scanf("%d %d", &a, &b);

    rec(a, b, 2, 1);

    return 0;

}

void rec(int a, int b, int div, int ans)

{

    if (div > a)

    {

        printf("HCF = %d", ans);

    }

    else

    {

        if ((a % div == 0) && (b % div == 0))

        {

            ans = ans \* div;

            rec(a / div, b / div, div, ans);

        }

        else

        {

            div = div + 1;

            rec(a, b, div, ans);

        }

    }

}

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

#include <stdio.h>

void rec(int, int, int, int);

int main(int argc, char \*argv[])

{

    int num;

    printf("Enter number = ");

    scanf("%d", &num);

    printf("1 ");

    rec(num, 0, 1, 0);

    return 0;

}

void rec(int num, int a, int b, int fact)

{

    if (num == 1)

    {

        return;

    }

    else

    {

        num = num - 1;

        fact = a + b;

        printf("%d ", fact);

        a = b;

        b = fact;

        rec(num, a, b, fact);

    }

}

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

#include <stdio.h>

void rec(int, int);

int main(int argc, char \*argv[])

{

    rec(12345,0);

    return 0;

}

void rec(int num, int count)

{

    if (num == 0)

    {

        printf("total number = %d", count);

    }

    else

    {

        count = count + 1;

        rec(num/10, count);

    }

}

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

#include <stdio.h>

int rec(int, int);

int main(int argc, char \*argv[])

{

    int num, pow;

    printf("Enter number = ");

    scanf("%d", &num);

    printf("Enter power = ");

    scanf("%d", &pow);

    printf("Answer = %d",rec(num, pow));

    return 0;

}

int rec(int num, int pow)

{

    if (pow == 1)

        return num;

    else

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

}