

# Bahria University, Karachi Campus



Course: SEL-311 Software Construction  
Term: Fall 2022, Class: BSE- 5(B)

Submitted By:

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# Bahria University,

## Karachi Campus



### LAB EXPERIMENT NO.

1

### LIST OF TASKS

TASK NO	OBJECTIVE
1	Write a program which calculates the square of a number using odd number series implemented with the help of recursion concept
2	Write a program which takes input of an integer number and returns the sum of all numbers. i.e., if input is 3453 then the output should be 15 (3+4+5+3).
3	Write a program to calculate binomial coefficients of any given number using recursion.
4	Calculation of number of moves for N number of disk in Tower of Hanoi problem using recursion.
5	Write a program to calculate H.C.F of two numbers, using recursion.

Submitted On:

14/10/2022

(Date: DD/MM/YY)

**Task# 01: - Write a program which calculates the square of a number using odd number series implemented with the help of recursion concept**

**Solution: -**

```
static void Main(string[] args)
{
    Console.WriteLine("enter limit for printing the series");
    int max = int.Parse(Console.ReadLine());
    Console.WriteLine("odd series : "+ oddseries(1,max));
    Console.ReadKey();
}

public static string oddseries(int n,int max= 100)
{
    if (n*n>max)
    {
        return " ";
    } return n * n + " " + oddseries(n + 2,max);
}
```

**Output: -**

```
enter limit for printing the series
1000
odd series : 1 9 25 49 81 121 169 225 289 361 441 529 625 729 841 961
```

**Task# 02: - Write a program which takes input of an integer number and returns the sum of all numbers. i.e., if input is 3453 then the output should be 15 (3+4+5+3).**

**Solution: -**

```
static int sum_of_digit(int num)
{
    if (num == 0)
        return 0;

    return (num % 10 + sum_of_digit(num / 10));
}

public static void Main()
{
    Console.WriteLine("Enter digits");
    int number = int.Parse(Console.ReadLine());
```

```
int res = sum_of_digit(number);
Console.WriteLine("Sum of digits in " + number + " is " + res);
}
```

**Output: -**

```
Enter digits
34567
Sum of digits in 34567 is 25
```

**Task# 03: - Write a program to calculate binomial coefficients of any given number using recursion.**

**Solution: -**

```
static int binomialCoeff(int num, int kth)
{
    if (kth == 0 || kth == num)
        return 1;
    return binomialCoeff(num - 1, kth - 1) + binomialCoeff(num - 1, kth);
}

public static void Main()
{
    int num = 10, kth = 4;
    Console.WriteLine("Value of C(" + num + "," + kth + ") is " + binomialCoeff(num, kth));
}
```

**Output: -**

```
Value of C(10,4) is 210
```

**Task# 04: - Calculation of number of moves for N number of disk in Tower of Hanoi problem using recursion.**

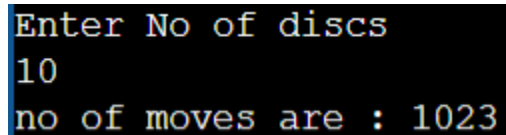
**Solution: -**

```
static void Main(string[] args)
{
    Console.WriteLine("Enter No of discs");
    int dscs = int.Parse(Console.ReadLine());
    Console.WriteLine("no of moves are : "+moves(dscs));
}

public static int moves(int dsc)
{
}
```

```
    if (dsc == 1)
    {
        return 1;
    }
    else
    {
        return 2 * moves(dsc - 1) + 1;
    }
}
```

**Output: -**



```
Enter No of discs
10
no of moves are : 1023
```

**Task# 05: - Write a program to calculate H.C.F of two numbers, using recursion.**

**Solution: -**

```
static void Main(string[] args)
{
    Console.WriteLine("Enter two integers");
    long num1 = Convert.ToInt64(Console.ReadLine());
    long num2 = Convert.ToInt64(Console.ReadLine());
    long hcf = gcd(num1, num2);
    Console.WriteLine("HCF of {0} and {1} = {2}\n", num1, num2, hcf);
}

static long gcd(long num1, long num2)
{
    if (num2 == 0)
    {
        return num1;
    }
    else
    {
        return gcd(num2, num1 % num2);
    }
}
```

```
}
```

**Output: -**

```
Enter two integers
16
24
HCF of 16 and 24 = 8
```