Bahria University,

Karachi Campus

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

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Signed **Remarks:** **Score:**

INDEX

SNO	DATE	LAB NO	LAB OBJECTIVE	SIGN
1	27/09/22	1		
2	07/10/22	2		

Bahria University,

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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.Write("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
```