[Lab no. 13] **[COMPUTER PROGRAMING]**
[Recursion]

Task # 01: Write a code which prints the following series:

2 4 8 16 - - - n

Task # 02: Write a program to calculate factorial of any given number using recursion

Task # 03: Write a program to print Fibonacci series using recursion.

Solution:

```
using Microsoft.Win32;
using System;
using System.IO;
using static System.Net.Mime.MediaTypeNames;
using static System.Net.WebRequestMethods;
using File = System.IO.File;

namespace ConsoleApp1
{
   class program
   {
      public static void Main(string[] args)
      {
         Console.WriteLine("\t\tMath Solution");
         Console.WriteLine("1)Press 1 for Power\n2)Press 2 for Factorial\n3)Press 3 for Fibonacci Series");
         int op = Convert.ToInt32(Console.ReadLine());


         if (op == 1)
         {
            Console.WriteLine("Enter The Number:");
            int num = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter Length:");
            int num1 = Convert.ToInt32(Console.ReadLine());


            for (int i = 1; i <= num1; i++)
            {
               Console.Write("{0},", Pow(num, i));
            }
            Console.WriteLine("\nDo you Want to Continue?");
```

```
            string rep = Console.ReadLine();
            if (rep == "y" || rep == "Yes" || rep == "yes" || rep == "Y")
            {
                Main(args);
            }
        }
        if (op == 2)
        {


            Console.WriteLine("Enter Number u want Factorial:");
            int fac = Convert.ToInt32(Console.ReadLine());


            Console.WriteLine("{0}!={1}", fac, Factorial(fac));


            Console.WriteLine("Do you Want to Continue?");
            string rep = Console.ReadLine();
            if (rep == "y" || rep == "Yes" || rep == "yes" || rep == "Y")
            {
                Main(args);
            }
        }
        if(op == 3)
        {
            Console.WriteLine("Enter the number for fibnonacci Series:");
            int number= Convert.ToInt32(Console.ReadLine());
            for(int i=1; i <= number; i++)
            {
                Console.Write(" {0} ",Fib(i));
            }
            Console.WriteLine("\nDo you Want to Continue?");
            string rep = Console.ReadLine();
            if (rep == "y" || rep == "Yes" || rep == "yes" || rep == "Y")
            {
                Main(args);
            }
        }
    }

    public static int Factorial(int num)
    {
        if (num <= 1)
        {
            return 1;
        }

        else
            return num * Factorial(num - 1);
    }
    static int Pow(int a, int b)
    {
        if (b == 0)
        {
            return 1;
```

```
        }
        else
        {
            return (a * Pow(a, b - 1));
        }
    }
    public static int Fib(int num)
    {
        if (num == 0)
        {
            return 0;
        }
        if (num == 1)
        {
            return 1;
        }
        else
        {
            return Fib(num - 1) + Fib(num - 2);
        }
    }
  }
}
```

Output: