

[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?");
            }
        }
    }
}
```

[Lab no. 13]

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```
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;
    }

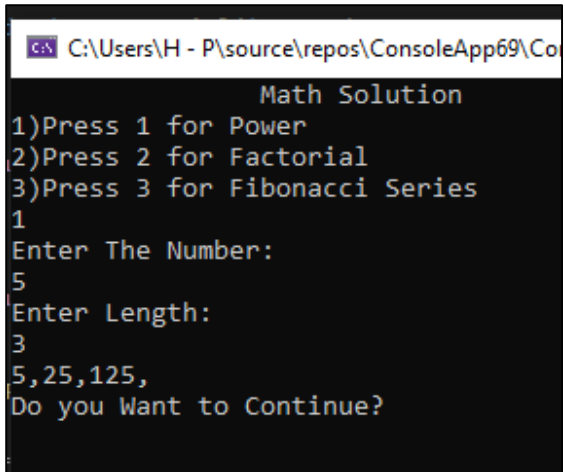
    else
        return num * Factorial(num - 1);
}
static int Pow(int a, int b)
{
    if (b == 0)
    {
        return 1;
    }
}
```

[Lab no. 13]

[COMPUTER PROGRAMING] [Recursion]

```
    }  
    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:



```
C:\Users\H - P\source\repos\ConsoleApp69\Co  
Math Solution  
1)Press 1 for Power  
2)Press 2 for Factorial  
3)Press 3 for Fibonacci Series  
1  
Enter The Number:  
5  
Enter Length:  
3  
5,25,125,  
Do you Want to Continue?
```