Bahria University,

Karachi Campus

LAB EXPERIMENT NO.

_____6_____

LIST OF TASKS

TASK NO	OBJECTIVE
1	Write a code which prints the following series: 2 4 8 - - - - n
2	Write a program which calculates the square of a number using odd number series implemented with the help of recursion concept.
3	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).
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.
6	Implement file code

Submitted On:

_____11/11/2021_____

(Date: DD/MM/YY)

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

2 4 8 - - - - n

Solution

```
public static int powerOfTwoSeries(int n, int m)
        {
                if (m <= n)
                {
                        Console.WriteLine(Math.Pow(2, m));
                        return powerOfTwoSeries(n, m + 1);
                }
                else
                {
                        return 0;
                }
        }
public static void Main()
        {
                Console.WriteLine("Power of two series for 10 numbers:-");
                powerOfTwoSeries(10,1);
        }
```

Output

```
Power of two series for 10 numbers:-
2
4
8
16
32
64
128
256
512
1024
```

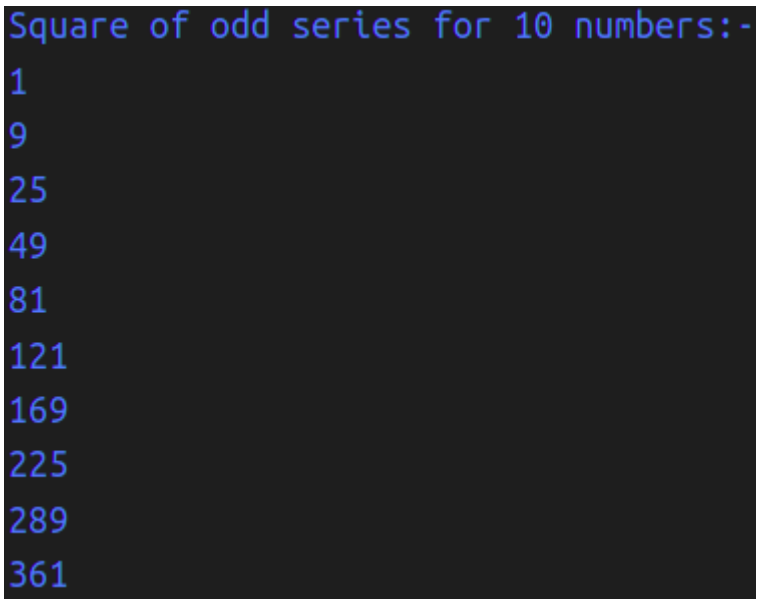
Task#02:- Write a program which calculates the square of a number using odd number series implemented with the help of recursion concept.

Solution

```
public static int squareOfOddSeries(int n, int m)
```

```
        {
                if (m <= (n + n))
                {
                        Console.WriteLine(Math.Pow(m, 2));
                        return squareOfOddSeries(n, m + 2);
                }
                else
                {
                        return 0;
                }
        }
public static void Main()
        {
                Console.WriteLine("Square of odd series for 10 numbers:-");
                squareOfOddSeries(10,1);
        }
```

Output



Task#03:- 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

```
public static int sumOfDigits(int digit)
   {
        if (digit > 0)
        {
                return (digit % 10) + sumOfDigits(digit / 10);
```

```
        }

        else {

                return 0;

        }

   }

public static void Main()
        {
                Console.WriteLine("Enter a number");
                int input = Convert.ToInt32(Console.ReadLine());
                Console.WriteLine("Sum of digits in {0} is
{1}",input,sumOfDigits(input));
        }
```

Output

```
Enter a number
123456789
Sum of digits in 123456789 is 45
```

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

Solution

```
static void towerOfHanoi(int n, char from_rod, char to_rod, char aux_rod,ref int
moves)

{

        if (n == 1)

        {

                moves += 1;

                Console.WriteLine("Move disk 1 from rod " + from_rod + " to rod " +
to_rod);

                return;

        }

        towerOfHanoi(n-1, from_rod, aux_rod, to_rod,ref moves);

        moves += 1;
```

```
        Console.WriteLine("Move disk " + n + " from rod " + from_rod + " to rod " +
to_rod);

         towerOfHanoi(n-1, aux_rod, to_rod, from_rod,ref moves);

}

public static void Main()
        {
                int moves = 0;
                int n = 4; // Number of disks
                towerOfHanoi(n, 'A', 'C', 'B',ref moves);
                Console.WriteLine("Moves = "+moves);
        }
```

Output

```
Move disk 1 from rod A to rod B
Move disk 2 from rod A to rod C
Move disk 1 from rod B to rod C
Move disk 3 from rod A to rod B
Move disk 1 from rod C to rod A
Move disk 2 from rod C to rod B
Move disk 1 from rod A to rod B
Move disk 4 from rod A to rod C
Move disk 1 from rod B to rod C
Move disk 2 from rod B to rod A
Move disk 1 from rod C to rod A
Move disk 3 from rod B to rod C
```

```
Move disk 1 from rod A to rod B
Move disk 2 from rod A to rod C
Move disk 1 from rod B to rod C
Moves = 15
```

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

Solution

```
public static int hcfOfTwoNumbers(int firstNumber,int secondNumber) {

        if(secondNumber == 0 || firstNumber == secondNumber) {

                return firstNumber;
```

```
        }
        else if(firstNumber == 0) {
                return secondNumber;
        }
        else if(firstNumber > secondNumber) {
                return hcfOfTwoNumbers(Math.Abs(firstNumber-
secondNumber),secondNumber);
        }
        else {
                return hcfOfTwoNumbers(secondNumber,Math.Abs(firstNumber-
secondNumber));
        }
    }
public static void Main()
        {
                Console.WriteLine("HCF of 100 and 1000 is
{0}",hcfOfTwoNumbers(100,1000));
        }
```

Output

```
HCF of 100 and 1000 is 100
```

Task#06:- Implement file code

Solution

```
class ReadFile {
public Dictionary<string,string> errors = new Dictionary<string,string>();
public List<string> result = new List<string>();


public void searchForFiles(string path) {
        try {
                foreach(string filename in Directory.GetFiles(path)) {
                        result.Add(filename);
```

```
                }

                foreach(string directory in Directory.GetDirectories(path)) {

                        searchForFiles(directory);

                }

        }

        catch(System.Exception ex) {

                errors.Add(path,ex.Message);

        }

    }

}

public static void Main()
        {
                ReadFile rf = new ReadFile();
                rf.searchForFiles(@"/home/mustufa/Desktop");
                foreach(string filename in rf.result) {
                        Console.WriteLine(filename);
                 }
        }
```

Output

```
./labtask6.csproj
./Program.cs
./bin/Debug/net6.0/labtask6.pdb
./bin/Debug/net6.0/labtask6.runtimeconfig.json
./bin/Debug/net6.0/labtask6.deps.json
./bin/Debug/net6.0/labtask6.dll
./bin/Debug/net6.0/labtask6
./bin/Debug/net6.0/ref/labtask6.dll
./.vscode/tasks.json
./.vscode/launch.json
./obj/labtask6.csproj.nuget.g.targets
./obj/project.assets.json
```

```
./obj/project.nuget.cache
./obj/labtask6.csproj.nuget.g.props
./obj/labtask6.csproj.nuget.dgspec.json
./obj/Debug/net6.0/labtask6.pdb
./obj/Debug/net6.0/.NETCoreApp,Version=v6.0.AssemblyAttributes.cs
./obj/Debug/net6.0/labtask6.AssemblyInfo.cs
./obj/Debug/net6.0/labtask6.csproj.AssemblyReference.cache
./obj/Debug/net6.0/labtask6.AssemblyInfoInputs.cache
./obj/Debug/net6.0/apphost
./obj/Debug/net6.0/labtask6.csproj.FileListAbsolute.txt
./obj/Debug/net6.0/labtask6.assets.cache
./obj/Debug/net6.0/labtask6.dll
```

```
./obj/Debug/net6.0/labtask6.GeneratedMSBuildEditorConfig.editorconfig
./obj/Debug/net6.0/labtask6.genruntimeconfig.cache
./obj/Debug/net6.0/labtask6.csproj.CoreCompileInputs.cache
./obj/Debug/net6.0/labtask6.GlobalUsings.g.cs
./obj/Debug/net6.0/ref/labtask6.dll
```