Bahria University,

Karachi Campus

A picture containing text, room

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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:

\_\_\_\_25/11/2021\_\_\_\_

(Date: DD/MM/YY)

**Task No. 1 : Write a code which prints the following series:**

**2 4 8 - - - - n**

**Solution:**

static int recursion(int n , int data)

{

data \*= 2;

Console.Write(data+"\t");

return (n <= 1) ? 0 : recursion(n - 1, data);

}

static void Main(string[] args)

{

Console.Write("Enter number : ");

int n = int.Parse(Console.ReadLine());

Console.WriteLine("\nPower of Series for {0} numbers are :", n);

recursion(n, 1);

Console.ReadLine();

}

**Output:**

A screenshot of a computer

Description automatically generated with medium confidence

**Task No. 2 : Write a program which calculates the square of a number using odd number series implemented with the help of recursion concept.**

**Solution:**

static int recursion(int n , int odd)

{

if (odd % 2 != 0)

{

Console.WriteLine("{0,-3} ==> {1,-3}", odd, odd\*odd);

return (n <= 1) ? 0 : recursion(n - 1, odd+1);

}

else

return recursion(n,odd+1);

}

static void Main(string[] args)

{

Console.Write("Enter number : ");

int n = int.Parse(Console.ReadLine());

Console.WriteLine("\nSquare of odd Series for {0} numbers are :\n", n);

recursion(n, 1);

Console.ReadLine();

}

Text

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**Task No. 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).**

**Solution:**

static int recursion(int input,int sum)

{

sum = input%10 + sum;

return (input == 0) ? sum : recursion(input/10,sum);

}

static void Main(string[] args)

{

Console.Write("Enter number : ");

int number = int.Parse(Console.ReadLine());

Console.Write("\nThe sum of {0} is = ",number);

Console.WriteLine(recursion(number,0));

Console.ReadLine();

}

**Output:**

Graphical user interface, text, chat or text message

Description automatically generated

**Task No. 4 : 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);

}

static void Main(string[] args)

{

int moves = 0;

int disk = 4;

towerOfHanoi(disk, 'A', 'C', 'B', ref moves);

Console.WriteLine("\n\tTotal Moves = " + moves);

Console.ReadLine();

}

**Output:**

A picture containing text, electronics

Description automatically generated

**Task No. 5 : Write a program to calculate H.C.F of two numbers, using recursion.**

**Solution:**

public static int HCF(int firstNumber, int secondNumber)

{

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

{

return firstNumber;

}

else if (firstNumber == 0)

{

return secondNumber;

}

else if (firstNumber > secondNumber) {

return HCF(Math.Abs(firstNumber-secondNumber), secondNumber);

}

else {

return HCF(secondNumber, Math.Abs(firstNumber-secondNumber));

}

}

static void Main(string[] args)

{

Console.WriteLine("HCF of 30 and 45 is {0}", HCF(30,45));

Console.ReadLine();

}

Text

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**Task No. 6 : Implement file code.**

**Solution:**

class FindFile

{

public Dictionary<string, string> errors = new Dictionary<string, string>();

public List<string> result = new List<string>();

public void search(string path)

{

try

{

foreach (string filename in Directory.GetFiles(path))

{

result.Add(filename);

}

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

{

search(directory);

}

}

catch (System.Exception ex)

{

errors.Add(path, ex.Message);

}

}

}

static void Main(string[] args)

{

FindFile file = new FindFile();

file.search(@"E:\University\3rd semester\algorithm Lab");

foreach (string filename in file.result)

{

Console.WriteLine(filename);

}

Console.ReadLine();

}

**Output:**

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