**Tutorial – 2**

**1 : Predict and write output for the following code.**

// 1 : Predict and write output for the following code.

using System;

namespace DecisionMaking{

    class Program{

        static void Main(string[] args){

            /\* local variable definition \*/

            int a = 10;

            /\* check the boolean condition using if statement \*/

            if (a < 20){

                /\* if condition is true then print the following \*/

                Console.WriteLine("a is less than 20");

            }

            Console.WriteLine("value of a is : {0}", a);

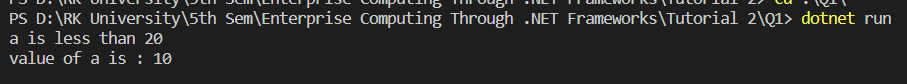
            Console.ReadLine();

        }

    }

}

**Output:**

****

**Q2. Write missing statement to get the desired output.**

/\* 2 : Write missing statement to get the desired output.

Output:

a is not less than 20

value of a is : 100

\*/

using System;

namespace DecisionMaking

{

    class Program{

        static void Main(string[] args){

            /\* local variable definition \*/

            int a = 100;

            /\* check the boolean condition \*/

            if (a < 20){

                /\* if condition is true then print the following \*/

                Console.WriteLine("a is less than 20");

            }else{

                /\* if condition is false then print the following \*/

                   //………………………………Missing statement-1……………………………….//

                Console.WriteLine("a is not less than 20");

             }

               //………………………………Missing statement-2……………………………….//

                Console.WriteLine("value of a is ", a);

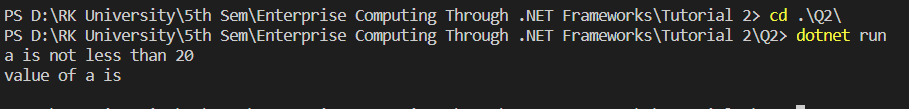
              Console.ReadLine();

        }

    }

}

**Output:**

****

**3 : Correct the following code and write output for the corrected code.**

**Correct Code:**

using System;

namespace ConsoleApplication1

{

    class Program{

        static void Main(string[] args){

            string firstName = "John";

            string lastName = "Doe";

            Console.WriteLine("Name: " + firstName + " " + lastName);

            Console.WriteLine("Please enter a new first name:");

            firstName = Console.ReadLine();

            Console.WriteLine("New name: " +  firstName + " " + lastName);

            Console.ReadLine();

        }

    }

}

**Output:**

**Text

Description automatically generated**

**4 : Input two number A and B. perform different operations using different operators and different data types available in C#. (Note : Follow all the operators and data types to do above task. Use Online help whenever necessary.)**

/\* 4 : Input two number A and B. perform different operations using different operators and different data types available in C#. (Note : Follow all the operators and data types to do above task. Use Online help whenever necessary.)

\*/

using System;

namespace Q4;

class Program{

    static void Main(String[] args){

        int a, b;

        Console.Write("A: ");

        a = Convert.ToInt32(Console.ReadLine());

        Console.Write("B: ");

        b = Convert.ToInt32(Console.ReadLine());

        calculate(a, b);

    }

    static void calculate(int a, int b){

        Console.WriteLine("Add: {0} + {1} = {2}", a, b, a+b);

        Console.WriteLine("Add: {0} - {1} = {2}", a, b, a-b);

        Console.WriteLine("Add: {0} \* {1} = {2}", a, b, a\*b);

        Console.WriteLine("Add: {0} / {1} = {2}", a, b, (b!=0)?(float)a/b:"Divided by Zero");

    }

}

**Output:**

**Text

Description automatically generated**

**5 : Rearrange the given code to correct the program. The resultant program will be to enter 5 elements into an array and print sum of these elements.**

/\*

5 : Rearrange the given code to correct the program. The resultant program will be to enter 5 elements into an array and print sum of these elements.

using System;

namespace ConsoleApplication1{

    class Program{

        static void Main(string[] args){

            for (int i = 0; i < 5; i++){

                string str = Console.ReadLine();

            }

            for (int i = 0; i < 5; i++){

                sum = sum + arr[i];

            }

            Console.WriteLine("Sum of Elements : {0}",sum);

            int[] arr = new int[5];

            int sum = 0;

            arr[i] = Convert.ToInt32(str);

            Console.Write("Enter Element {0}: ", i);

            Console.Read();

        }

    }

}

Output:

Enter Element 0: 1

Enter Element 1: 2

Enter Element 2: 3

Enter Element 3: 4

Enter Element 4: 5

Sum of Elements : 15

\*/

using System;

namespace ConsoleApplication1{

    class Program{

        static void Main(string[] args){

            int[] arr = new int[5];

            int sum = 0;

            for (int i = 0; i < 5; i++){

                Console.Write("Enter Element {0}: ", i);

                string str = Console.ReadLine();

                arr[i] = Convert.ToInt32(str);

            }

            for (int i = 0; i < 5; i++){

                sum = sum + arr[i];

            }

            Console.WriteLine("Sum of Elements : {0}",sum);

            Console.Read();

        }

    }

}

**Output:**

**Text

Description automatically generated**

**6: Write missing statement to get the desired output.**

/\*

6: Write missing statement to get the desired output.

using System;

public class Hello3{

   public static void Main(string[] args){

      Console.WriteLine("Hello, World!");

      Console.WriteLine("You entered the following {0} command line arguments:",args.Length );

          //………………………………Missing statement-1……………………………….//

          //………………………………Missing statement-2……………………………….//

          //………………………………Missing statement-3……………………………….//

          //………………………………Missing statement-4……………………………….//

   }

}

Output:

-------------------

Hello, World!

You entered the following 4 command line arguments:

A

B

C

D

\*/

using System;

public class Hello3{

    public static void Main(string[] args){

        Console.WriteLine("Hello, World!");

        Console.WriteLine("You entered the following {0} command line arguments:",args.Length );

        // for(int i = 0; i < args.Length; i++){

        //     Console.WriteLine(args[i]);

        // }

        foreach(object i in args){

            Console.WriteLine(i);

        }

   }

}

**Text

Description automatically generated**

**7 : Predict and write the output of the given code.**

// 7 : Predict and write the output of the given code.

using System;

namespace CalculatorApplication{

   class NumberManipulator{

        public void swap(ref int x, ref int y){

            int temp;

            temp = x; /\* save the value of x \*/

            x = y;   /\* put y into x \*/

            y = temp; /\* put temp into y \*/

       }

   }

    class TestRef{

        static void Main(string[] args){

            NumberManipulator n = new NumberManipulator();

            /\* local variable definition \*/

            int a = 100;

            int b = 200;

            Console.WriteLine("Before swap, value of a : {0}", a);

            Console.WriteLine("Before swap, value of b : {0}", b);

            /\* calling a function to swap the values \*/

            n.swap(ref a, ref b);

            Console.WriteLine("After swap, value of a : {0}", a);

            Console.WriteLine("After swap, value of b : {0}", b);

            Console.ReadLine();

        }

   }

}

**Output:**

**Text

Description automatically generated**

**8 : Find out error code and correct it. Write the output of the corrected code.**

using System;

namespace CalculatorApplication{

   class NumberManipulator{

        public int getValues(out int x, out int y, out int z ){

            Console.WriteLine("Enter the first value: ");

            x = Convert.ToInt32(Console.ReadLine());

            Console.WriteLine("Enter the second value: ");

            y = Convert.ToInt32(Console.ReadLine());

            Console.WriteLine("Enter the third value: ");

            z = Convert.ToInt32(Console.ReadLine());

            int sum = x + y + z;

            return sum;

      }

   }

    class TestOut{

        static void Main(string[] args){

            NumberManipulator n = new NumberManipulator();

            /\* local variable definition \*/

            int a , b, c, sum;

            /\* calling a function to get the values \*/

            sum = n.getValues(out a, out b, out c);

            Console.WriteLine("After method call, value of a : {0}", a);

            Console.WriteLine("After method call, value of b : {0}", b);

            Console.WriteLine("After method call, value of c : {0}", c);

            Console.WriteLine("Sum : {0}", sum);

      }

   }

}

**Output:**

**Text

Description automatically generated**

**9: Given an array A containing 2\*N+2 positive numbers, out of which 2\*N numbers exist in pairs whereas the other two number occur exactly once and are distinct. Find the other two numbers.**

**Example 1: Input:**

N = 2

arr[] = {1, 2, 3, 2, 1, 4}

**Output:**

3 4

**Explanation:**

3 and 4 occur exactly once.

**Example 2:**

**Input:**

N = 1

arr[] = {2, 1, 3, 2}

**Output:**

1 3

**Explanation:**

1 3 occur exactly once.

// 9 : Given an array A containing 2\*N+2 positive numbers, out of which 2\*N numbers exist in pairs whereas the other two number occur exactly once and are distinct. Find the other two numbers.

using System;

namespace Q9;

public class TwoNonRepeatingXOR{

    public void find(int[] arrA){

        int xor = arrA[0];

        for(int i = 1; i < arrA.Length; i++){

            // This will find XOR of all element in an array i.e 1 ^ 2 ^ 3 ^ 2 ^ 1 ^ 4 = 7

            /\*

                0 ^ 0 = 0

                0 ^ 1 = 1

                1 ^ 0 = 1

                1 ^ 1 = 0

                xor is used to check if two element is equal or not

            \*/

            xor ^= arrA[i];

            // Console.WriteLine(xor);

        }

        int right\_most\_set\_bit = xor & ~(xor-1); // This will give 1 in the right most set bit

        int x = 0,  y = 0;

        // Console.WriteLine(right\_most\_set\_bit);

        for(int i = 0; i < arrA.Length; i++){

            int a = arrA[i];

            if((a & right\_most\_set\_bit) != 0){

                x = x ^ arrA[i];

            }else{

                y = y ^ arrA[i] ;

            }

        }

        if(y > x){

            Console.WriteLine("{0} and {1} occur exactly once.", x, y);

        }

        else{

            Console.WriteLine("{0} and {1} occur exactly once.", y, x);

        }

    }

}

class program{

    static void Main(string[] args){

        TwoNonRepeatingXOR t1 = new TwoNonRepeatingXOR();

        TwoNonRepeatingXOR t2 = new TwoNonRepeatingXOR();

        int[] arr1 = {1, 2, 3, 2, 1, 4};

        int[] arr2 = {2, 1, 3, 2};

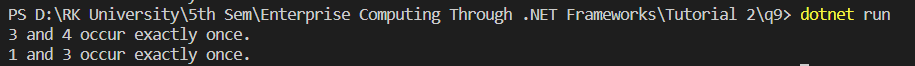
        t1.find(arr1);

        t2.find(arr2);

    }

}

**Output:**

****

**10. 10: Given a matrix mat[][] of size N x M, where every row and column is sorted in increasing order, and a number X is given. The task is to find whether element X is present in the matrix or not.**

**Example 1:**

**Input**:

N = 3, M = 3

mat[][] = 3 30 38

         44 52 54

         57 60 69

X = 62

**Output**:

0

**Explanation**:

62 is not present in the

matrix, so output is 0

**Example 2:**

**Input**:

N = 1, M = 6

mat[][] = 18 21 27 38 55 67

X = 55

**Output**:

1

**Explanation**:

55 is present in the

matrix at 5th cell.

**Your Task:**

You don't need to read input or print anything. You just have to complete the function matSearch() which takes a 2D matrix **mat**[][], its dimensions **N** and **M** and integer **X** as inputs and returns 1 if the element **X** is present in the matrix and 0 otherwise.

**Expected Time Complexity**: O(N+M).

**Expected Auxiliary Space**: O(1).

**Constraints**:

1 <= N, M <= 1005

1 <= mat[][] <= 10000000

1<= X <= 10000000

using System;

namespace Q10;

class program{

    public static void Main(String[] args){

        int n, m;

        n = Convert.ToInt32(Console.ReadLine());

        m = Convert.ToInt32(Console.ReadLine());

        int[, ] arr = new int[n, m];

        for(int i = 0; i < n; i++){

            for(int j = 0; j < m; j++){

                arr[i, j] = Convert.ToInt32(Console.ReadLine());

            }

        }

        int x;

        int flag = 0;

        x = Convert.ToInt32(Console.ReadLine());

        for(int i = 0; i < n; i++){

            for(int j = 0; j < m; j++){

                if(arr[i, j] == x){

                    flag = 1;

                }

            }

        }

        // if(flag > 0){

        //     Console.WriteLine(flag);

        // }

            Console.WriteLine(flag);

    }

}

**14. Write a Program to find the eligibility of admission for a  professional course  
based on the following criteria:  
Marks in Maths >=65  
Marks in Phy >=55  
Marks in Chem>=50 and  
Total in all three subject >=180 or  
Total in Math and Physics >=140  
INPUT:  
Input the marks obtained in Maths :72  
Input the marks obtained in Physics :65  
Input the marks obtained in Chemistry :51  
OUTPUT:  
The candidate is eligible for admission.**

using System;

namespace Q12;

class program{

    static void Main(String[] args){

        int math, phy, chem;

        Console.Write("Input the marks obtained in Maths: ");

        math = Convert.ToInt32(Console.ReadLine());

        // Console.ReadLine();

        Console.Write("Input the marks obtained in Physics: ");

        phy = Convert.ToInt32(Console.ReadLine());

        // Console.ReadLine();

        Console.Write("Input the marks obtained in Chemistry: ");

        chem = Convert.ToInt32(Console.ReadLine());

        if(eligibleForAdmission(math, phy, chem)){

            Console.WriteLine("The candidate is eligible for adminssion");

        }else{

            Console.WriteLine("The candidate is not eligible for adminssion");

        }

    }

    static bool eligibleForAdmission(int math, int phy, int chem){

        if(math >= 65 && phy >= 55 && chem >= 50 && ((math + phy + chem) >= 180) || (math + phy) >= 140){

            return true;

        }

        return false;

    }

}