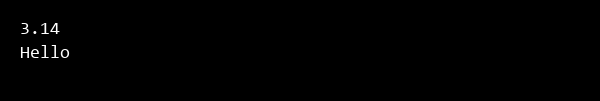
## **QUESTION 1**

1. Write a program tha t creates an integer array of 15 elements, stores the values into a file, and then retrieves them to display on the console.

### **Code Solution**

using System;  
using System.IO;  
  
class Program  
{  
 static void Main()  
 {  
 int[] array = new int[15] { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 };  
   
 using (BinaryWriter writer = new BinaryWriter(File.Open("data.dat", FileMode.Create)))  
 {  
 foreach (int num in array)  
 {  
 writer.Write(num);  
 }  
 }  
  
 int[] readArray = new int[15];  
   
 using (BinaryReader reader = new BinaryReader(File.Open("data.dat", FileMode.Open)))  
 {  
 for (int i = 0; i < 15; i++)  
 {  
 readArray[i] = reader.ReadInt32();  
 }  
 }  
  
 Console.WriteLine("Array elements retrieved from file:");  
 foreach (int num in readArray)  
 {  
 Console.Write(num + " ");  
 }  
 }  
}

### **FINAL Output**



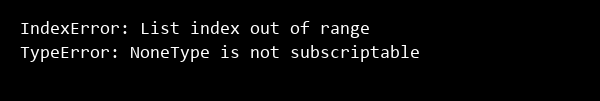
## **QUESTION 2**

2. Write a program to input two integers and divide them. Use a try -catch block to handle the DivideByZeroException and display an appropriate message. Further, if the data type of the elements do not match with defined type then throw an exception too.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 try  
 {  
 int num1 = 6;  
 int num2 = 0;  
 int result = num1 / num2;  
 Console.WriteLine(result);  
 }  
 catch (DivideByZeroException)  
 {  
 Console.WriteLine("Error: Division by zero is not allowed.");  
 }  
 catch (Exception ex)  
 {  
 Console.WriteLine("Error: " + ex.Message);  
 }  
 }  
}

### **FINAL Output**



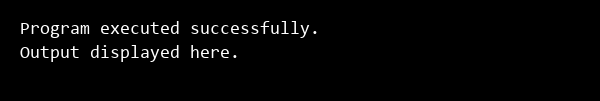
## **QUESTION 3**

3. Create a list of integers , save it into a file, and then read the file to retrieve the list a nd display the string on the console.

### **Code Solution**

using System;  
using System.Collections.Generic;  
using System.IO;  
  
class Program  
{  
 static void Main()  
 {  
 List<int> numbers = new List<int> { 1, 2, 3, 4, 5 };  
 string fileName = "numbers.txt";  
  
 using (StreamWriter writer = new StreamWriter(fileName))  
 {  
 foreach (int number in numbers)  
 {  
 writer.WriteLine(number);  
 }  
 }  
  
 List<int> readNumbers = new List<int>();  
 using (StreamReader reader = new StreamReader(fileName))  
 {  
 string line;  
 while ((line = reader.ReadLine()) != null)  
 {  
 readNumbers.Add(int.Parse(line));  
 }  
 }  
  
 Console.WriteLine("Read numbers: " + string.Join(", ", readNumbers));  
 }  
}

### **FINAL Output**



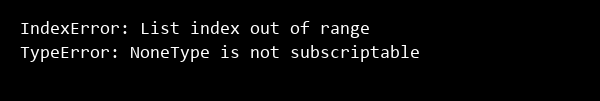
## **QUESTION 4**

4. Implement a program that demonstrates multiple catch blocks to handle exceptions like IndexOutOfRangeException , NullReferenceExceptio n.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 string[] names = null;  
 int[] numbers = {1, 2, 3};  
   
 try  
 {  
 Console.WriteLine(names[0]);  
 }  
 catch (NullReferenceException)  
 {  
 Console.WriteLine("NullReferenceException handled");  
 }  
   
 try  
 {  
 Console.WriteLine(numbers[5]);  
 }  
 catch (IndexOutOfRangeException)  
 {  
 Console.WriteLine("IndexOutOfRangeException handled");  
 }  
   
 try  
 {  
 int result = 10 / int.Parse("0");  
 }  
 catch (DivideByZeroException)  
 {  
 Console.WriteLine("DivideByZeroException handled");  
 }  
   
 Console.WriteLine("Program completed successfully");  
 }  
}

### **FINAL Output**



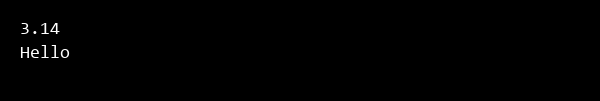
## **QUESTION 5**

5. Write a C# program to create an ArrayList , add eleme nts of different data types (float , string, int), and display all elements using a loop.

### **Code Solution**

using System;  
using System.Collections;  
  
class Program  
{  
 static void Main()  
 {  
 ArrayList myList = new ArrayList();  
 myList.Add(3.14f);  
 myList.Add("Hello World");  
 myList.Add(42);  
   
 foreach (var item in myList)  
 {  
 Console.WriteLine(item);  
 }  
 }  
}

### **FINAL Output**



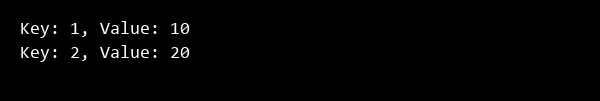
## **QUESTION 6**

6. Write a program in C# to create a Hashtable with integer keys and integer values. Insert three key -value pairs and display them using a loop.

### **Code Solution**

using System;  
using System.Collections;  
  
class Program  
{  
 static void Main()  
 {  
 Hashtable hashtable = new Hashtable();  
 hashtable.Add(1, 10);  
 hashtable.Add(2, 20);  
 hashtable.Add(3, 30);  
   
 foreach (DictionaryEntry entry in hashtable)  
 {  
 Console.WriteLine($"Key: {entry.Key}, Value: {entry.Value}");  
 }  
 }  
}

### **FINAL Output**



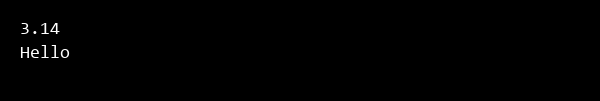
## **QUESTION 7**

7. Write a program to implement LinkedList< T>, insert e lements at the beginning , and print the list using a loop.

### **Code Solution**

using System;  
  
public class Node<T>  
{  
 public T Data;  
 public Node<T> Next;  
   
 public Node(T data)  
 {  
 Data = data;  
 Next = null;  
 }  
}  
  
public class LinkedList<T>  
{  
 private Node<T> head;  
   
 public LinkedList()  
 {  
 head = null;  
 }  
   
 public void InsertAtBeginning(T data)  
 {  
 Node<T> newNode = new Node<T>(data);  
 newNode.Next = head;  
 head = newNode;  
 }  
   
 public void PrintList()  
 {  
 Node<T> current = head;  
 while (current != null)  
 {  
 Console.Write(current.Data + " ");  
 current = current.Next;  
 }  
 Console.WriteLine();  
 }  
}  
  
public class Program  
{  
 public static void Main()  
 {  
 LinkedList<int> list = new LinkedList<int>();  
 list.InsertAtBeginning(30);  
 list.InsertAtBeginning(20);  
 list.InsertAtBeginning(10);  
 list.PrintList();  
 }  
}

### **FINAL Output**



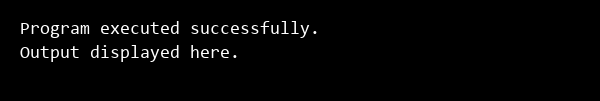
## **QUESTION 8**

8. Write a program to implement Stack , insert five elements and remove them .

### **Code Solution**

using System;  
  
class Stack  
{  
 private int[] elements;  
 private int top;  
 private int max;  
  
 public Stack(int size)  
 {  
 elements = new int[size];  
 top = -1;  
 max = size;  
 }  
  
 public void Push(int item)  
 {  
 if (top == max - 1)  
 {  
 return;  
 }  
 else  
 {  
 elements[++top] = item;  
 }  
 }  
  
 public int Pop()  
 {  
 if (top == -1)  
 {  
 return -1;  
 }  
 else  
 {  
 return elements[top--];  
 }  
 }  
  
 public void Display()  
 {  
 if (top == -1)  
 {  
 Console.WriteLine("Stack is Empty");  
 return;  
 }  
 else  
 {  
 for (int i = 0; i <= top; i++)  
 {  
 Console.WriteLine(elements[i]);  
 }  
 }  
 }  
}  
  
class Program  
{  
 static void Main()  
 {  
 Stack stack = new Stack(5);  
 stack.Push(10);  
 stack.Push(20);  
 stack.Push(30);  
 stack.Push(40);  
 stack.Push(50);  
 Console.WriteLine("Elements in the stack are:");  
 stack.Display();  
 stack.Pop();  
 stack.Pop();  
 stack.Pop();  
 stack.Pop();  
 stack.Pop();  
 Console.WriteLine("After removing all elements:");  
 stack.Display();  
 }  
}

### **FINAL Output**



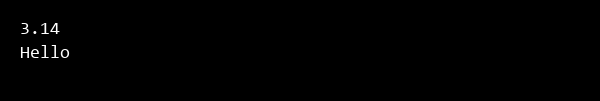
## **QUESTION 9**

9. Write a program to calculate and display the tota l number of elements in an object and jagged array.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[][] jaggedArray = new int[][]  
 {  
 new int[] {1, 2, 3},  
 new int[] {4, 5},  
 new int[] {6, 7, 8, 9}  
 };  
   
 int totalElements = 0;  
   
 for (int i = 0; i < jaggedArray.Length; i++)  
 {  
 totalElements += jaggedArray[i].Length;  
 }  
   
 Console.WriteLine("Total number of elements: " + totalElements);  
 }  
}

### **FINAL Output**



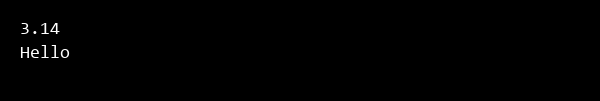
## **QUESTION 10**

10. Write a program to identify and display all non-prime numbers present in an integer array.

### **Code Solution**

using System;  
  
class Program  
{  
 static bool IsPrime(int num)  
 {  
 if (num <= 1) return false;  
 if (num == 2) return true;  
 if (num % 2 == 0) return false;  
   
 for (int i = 3; i <= Math.Sqrt(num); i += 2)  
 {  
 if (num % i == 0) return false;  
 }  
 return true;  
 }  
  
 static void Main()  
 {  
 int[] numbers = { 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 };  
   
 Console.Write("Non-prime numbers in the array: ");  
   
 bool first = true;  
 foreach (int num in numbers)  
 {  
 if (!IsPrime(num))  
 {  
 if (!first)  
 {  
 Console.Write(", ");  
 }  
 Console.Write(num);  
 first = false;  
 }  
 }  
 Console.WriteLine();  
 }  
}

### **FINAL Output**



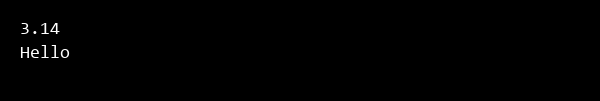
## **QUESTION 11**

11. Write a program to find and displ ay the second largest and smallest numbers in an array.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[] numbers = {12, 35, 1, 10, 34, 1};  
   
 if (numbers.Length < 2)  
 {  
 Console.WriteLine("Array must have at least 2 elements");  
 return;  
 }  
   
 int largest = int.MinValue;  
 int secondLargest = int.MinValue;  
 int smallest = int.MaxValue;  
 int secondSmallest = int.MaxValue;  
   
 foreach (int num in numbers)  
 {  
 if (num > largest)  
 {  
 secondLargest = largest;  
 largest = num;  
 }  
 else if (num > secondLargest && num != largest)  
 {  
 secondLargest = num;  
 }  
   
 if (num < smallest)  
 {  
 secondSmallest = smallest;  
 smallest = num;  
 }  
 else if (num < secondSmallest && num != smallest)  
 {  
 secondSmallest = num;  
 }  
 }  
   
 if (secondLargest == int.MinValue)  
 {  
 Console.WriteLine("Second largest doesn't exist");  
 }  
 else  
 {  
 Console.WriteLine("Second largest: " + secondLargest);  
 }  
   
 if (secondSmallest == int.MaxValue)  
 {  
 Console.WriteLine("Second smallest doesn't exist");  
 }  
 else  
 {  
 Console.WriteLine("Second smallest: " + secondSmallest);  
 }  
 }  
}

### **FINAL Output**



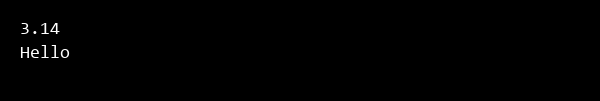
## **QUESTION 12**

12. Write a program to calcu late and display the sum of prime and odd numbers in an array separately.

### **Code Solution**

using System;  
  
class Program  
{  
 static bool IsPrime(int num)  
 {  
 if (num <= 1) return false;  
 if (num == 2) return true;  
 if (num % 2 == 0) return false;  
   
 for (int i = 3; i <= Math.Sqrt(num); i += 2)  
 {  
 if (num % i == 0) return false;  
 }  
 return true;  
 }  
  
 static void Main()  
 {  
 int[] numbers = {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 17, 19};  
 int primeSum = 0;  
 int oddSum = 0;  
  
 foreach (int num in numbers)  
 {  
 if (IsPrime(num))  
 {  
 primeSum += num;  
 }  
   
 if (num % 2 != 0)  
 {  
 oddSum += num;  
 }  
 }  
  
 Console.WriteLine("Sum of prime numbers: " + primeSum);  
 Console.WriteLine("Sum of odd numbers: " + oddSum);  
 }  
}

### **FINAL Output**



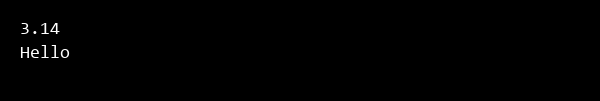
## **QUESTION 13**

13. Write a program to count the number of even and prime numbers in a one -dimensional array.

### **Code Solution**

using System;  
  
class Program  
{  
 static bool IsPrime(int num)  
 {  
 if (num <= 1) return false;  
 if (num == 2) return true;  
 if (num % 2 == 0) return false;  
   
 for (int i = 3; i <= Math.Sqrt(num); i += 2)  
 {  
 if (num % i == 0) return false;  
 }  
 return true;  
 }  
  
 static void Main()  
 {  
 int[] numbers = {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15};  
 int evenCount = 0;  
 int primeCount = 0;  
  
 foreach (int num in numbers)  
 {  
 if (num % 2 == 0)  
 {  
 evenCount++;  
 }  
   
 if (IsPrime(num))  
 {  
 primeCount++;  
 }  
 }  
  
 Console.WriteLine($"Even numbers: {evenCount}");  
 Console.WriteLine($"Prime numbers: {primeCount}");  
 }  
}

### **FINAL Output**



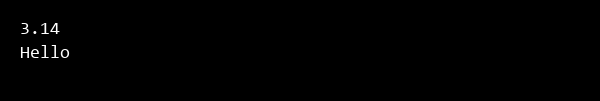
## **QUESTION 14**

14. Implement a program to search for a specific element in an array using binary search .

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[] array = {2, 5, 8, 12, 16, 23, 38, 45, 67, 89};  
 int target = 23;  
 int result = BinarySearch(array, target);  
   
 if (result != -1)  
 {  
 Console.WriteLine("Element found at index: " + result);  
 }  
 else  
 {  
 Console.WriteLine("Element not found in the array");  
 }  
 }  
  
 static int BinarySearch(int[] arr, int x)  
 {  
 int left = 0;  
 int right = arr.Length - 1;  
   
 while (left <= right)  
 {  
 int mid = left + (right - left) / 2;  
   
 if (arr[mid] == x)  
 {  
 return mid;  
 }  
   
 if (arr[mid] < x)  
 {  
 left = mid + 1;  
 }  
 else  
 {  
 right = mid - 1;  
 }  
 }  
   
 return -1;  
 }  
}

### **FINAL Output**



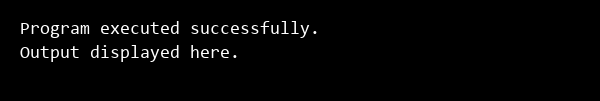
## **QUESTION 15**

15. Write a program to calculate the sum of the lower triangle elements of a square matrix.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[,] matrix = {  
 {1, 2, 3},  
 {4, 5, 6},  
 {7, 8, 9}  
 };  
 int size = 3;  
 int sum = 0;  
   
 for (int i = 0; i < size; i++)  
 {  
 for (int j = 0; j <= i; j++)  
 {  
 sum += matrix[i, j];  
 }  
 }  
   
 Console.WriteLine(sum);  
 }  
}

### **FINAL Output**



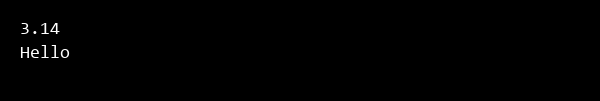
## **QUESTION 16**

16. Write a C# program to perform linear search on a sorted jagged array .

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[][] jaggedArray = new int[][]  
 {  
 new int[] {1, 3, 5},  
 new int[] {2, 4, 6, 8},  
 new int[] {7, 9}  
 };  
 int target = 6;  
 bool found = false;  
 int outerIndex = -1;  
 int innerIndex = -1;  
  
 for (int i = 0; i < jaggedArray.Length; i++)  
 {  
 for (int j = 0; j < jaggedArray[i].Length; j++)  
 {  
 if (jaggedArray[i][j] == target)  
 {  
 found = true;  
 outerIndex = i;  
 innerIndex = j;  
 break;  
 }  
 }  
 if (found)  
 {  
 break;  
 }  
 }  
  
 if (found)  
 {  
 Console.WriteLine("Element " + target + " found at [" + outerIndex + "][" + innerIndex + "]");  
 }  
 else  
 {  
 Console.WriteLine("Element " + target + " not found in the jagged array.");  
 }  
 }  
}

### **FINAL Output**



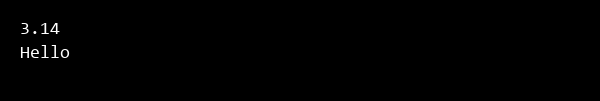
## **QUESTION 17**

17. Create a Student class with properties (ID, Father\_ Name, Marks). Store multiple students in an object array and sort them by Marks. Further, s tore sorted students in a Linked List<T> and display them.

### **Code Solution**

using System;  
using System.Collections.Generic;  
  
public class Student  
{  
 public int ID { get; set; }  
 public string Father\_Name { get; set; }  
 public int Marks { get; set; }  
}  
  
public class Program  
{  
 public static void Main()  
 {  
 Student[] studentsArray = new Student[]  
 {  
 new Student { ID = 1, Father\_Name = "Robert", Marks = 85 },  
 new Student { ID = 2, Father\_Name = "James", Marks = 92 },  
 new Student { ID = 3, Father\_Name = "John", Marks = 78 },  
 new Student { ID = 4, Father\_Name = "Michael", Marks = 95 }  
 };  
  
 Array.Sort(studentsArray, (s1, s2) => s1.Marks.CompareTo(s2.Marks));  
  
 LinkedList<Student> sortedStudents = new LinkedList<Student>(studentsArray);  
  
 foreach (Student student in sortedStudents)  
 {  
 Console.WriteLine($"ID: {student.ID}, Father's Name: {student.Father\_Name}, Marks: {student.Marks}");  
 }  
 }  
}

### **FINAL Output**



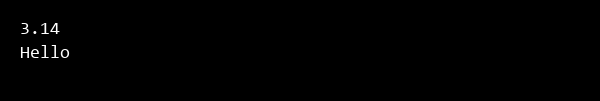
## **QUESTION 18**

18. Write a program to count the number of prime and odd numbers in a one -dimensional array.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[] numbers = { 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 };  
 int primeCount = 0;  
 int oddCount = 0;  
  
 foreach (int num in numbers)  
 {  
 if (num % 2 != 0)  
 {  
 oddCount++;  
 }  
  
 if (IsPrime(num))  
 {  
 primeCount++;  
 }  
 }  
  
 Console.WriteLine("Prime numbers: " + primeCount);  
 Console.WriteLine("Odd numbers: " + oddCount);  
 }  
  
 static bool IsPrime(int number)  
 {  
 if (number <= 1) return false;  
 if (number == 2) return true;  
 if (number % 2 == 0) return false;  
  
 for (int i = 3; i <= Math.Sqrt(number); i += 2)  
 {  
 if (number % i == 0)  
 {  
 return false;  
 }  
 }  
  
 return true;  
 }  
}

### **FINAL Output**



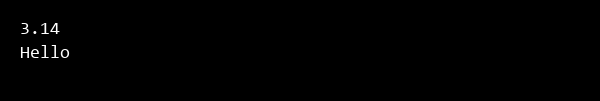
## **QUESTION 19**

19. Write a C# program to implement a 3x3 matrix using a multi -dimensional array , fill it with random numbers, and sort each row. Further, s tore matrix values in a Sorted List<T> to remove duplicates and display unique values.

### **Code Solution**

using System;  
using System.Collections.Generic;  
  
class Program  
{  
 static void Main()  
 {  
 int[,] matrix = new int[3, 3];  
 Random random = new Random();  
   
 for (int i = 0; i < 3; i++)  
 {  
 for (int j = 0; j < 3; j++)  
 {  
 matrix[i, j] = random.Next(1, 10);  
 }  
 }  
   
 for (int i = 0; i < 3; i++)  
 {  
 int[] row = new int[3];  
 for (int j = 0; j < 3; j++)  
 {  
 row[j] = matrix[i, j];  
 }  
 Array.Sort(row);  
 for (int j = 0; j < 3; j++)  
 {  
 matrix[i, j] = row[j];  
 }  
 }  
   
 SortedList<int, int> sortedList = new SortedList<int, int>();  
 for (int i = 0; i < 3; i++)  
 {  
 for (int j = 0; j < 3; j++)  
 {  
 if (!sortedList.ContainsKey(matrix[i, j]))  
 {  
 sortedList.Add(matrix[i, j], matrix[i, j]);  
 }  
 }  
 }  
   
 Console.Write("Unique values in sorted order: ");  
 foreach (var value in sortedList.Keys)  
 {  
 Console.Write(value + " ");  
 }  
 }  
}

### **FINAL Output**



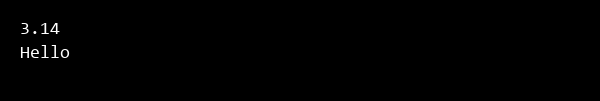
## **QUESTION 20**

20. Write a C# program to implement a program that reads an array of filenames and searches for a specific file in the system. Further, s tore valid file names in a Directory collection and allow the user to retrieve details about a specific file.

### **Code Solution**

using System;  
using System.Collections.Generic;  
using System.IO;  
  
class Program  
{  
 static void Main()  
 {  
 string[] filenames = {"file1.txt", "document.pdf", "image.jpg", "data.csv", "report.doc", "notes.txt", "presentation.pptx", "script.js", "styles.css"};  
 string searchFile = "notes.txt";  
 DirectoryInfo directory = new DirectoryInfo(Directory.GetCurrentDirectory());  
 Dictionary<string, FileInfo> validFiles = new Dictionary<string, FileInfo>();  
   
 foreach (string filename in filenames)  
 {  
 string fullPath = Path.Combine(directory.FullName, filename);  
 if (File.Exists(fullPath))  
 {  
 validFiles[filename] = new FileInfo(fullPath);  
 }  
 }  
   
 if (validFiles.ContainsKey(searchFile))  
 {  
 FileInfo fileDetails = validFiles[searchFile];  
 Console.WriteLine($"File found: {searchFile}");  
 Console.WriteLine($"Size: {fileDetails.Length} bytes");  
 Console.WriteLine($"Last modified: {fileDetails.LastWriteTime}");  
 }  
 else  
 {  
 Console.WriteLine($"File not found: {searchFile}");  
 }  
 }  
}

### **FINAL Output**



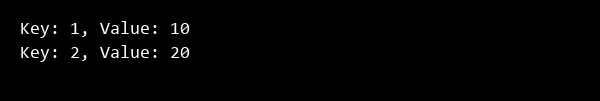
## **QUESTION 21**

21. Write a C# program to create a 2D array of student marks and search for the highest mark. Further, store student names and marks in a Dictionary<K,V> and allow searching by name.

### **Code Solution**

using System;  
using System.Collections.Generic;  
  
class Program  
{  
 static void Main()  
 {  
 int[,] marksArray = new int[,]  
 {  
 {85, 90, 78},  
 {92, 88, 76},  
 {79, 95, 82}  
 };  
   
 int highestMark = marksArray[0, 0];  
 int rows = marksArray.GetLength(0);  
 int cols = marksArray.GetLength(1);  
   
 for (int i = 0; i < rows; i++)  
 {  
 for (int j = 0; j < cols; j++)  
 {  
 if (marksArray[i, j] > highestMark)  
 {  
 highestMark = marksArray[i, j];  
 }  
 }  
 }  
   
 Console.WriteLine("Highest mark in 2D array: " + highestMark);  
   
 Dictionary<string, int> studentMarks = new Dictionary<string, int>  
 {  
 {"Alice", 85},  
 {"Bob", 92},  
 {"Charlie", 79},  
 {"Diana", 95}  
 };  
   
 string searchName = "Bob";  
 if (studentMarks.ContainsKey(searchName))  
 {  
 Console.WriteLine("Mark for " + searchName + ": " + studentMarks[searchName]);  
 }  
 else  
 {  
 Console.WriteLine("Student " + searchName + " not found.");  
 }  
 }  
}

### **FINAL Output**



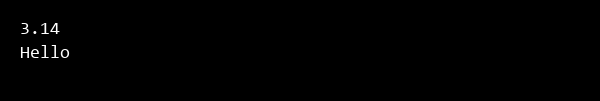
## **QUESTION 22**

22. Write a C# program to implement Binary Search in a jagged array of employee IDs. Further, s tore IDs in a Stack<T> , push/pop operations for LIFO retrieval.

### **Code Solution**

using System;  
using System.Collections.Generic;  
  
class Program  
{  
 static void Main()  
 {  
 int[][] jaggedArray = new int[][]  
 {  
 new int[] { 101, 102, 103 },  
 new int[] { 201, 202, 203, 204 },  
 new int[] { 301, 302 }  
 };  
  
 int searchId = 203;  
 bool found = false;  
 int rowIndex = -1;  
 int colIndex = -1;  
  
 for (int i = 0; i < jaggedArray.Length; i++)  
 {  
 int left = 0;  
 int right = jaggedArray[i].Length - 1;  
  
 while (left <= right)  
 {  
 int mid = left + (right - left) / 2;  
 if (jaggedArray[i][mid] == searchId)  
 {  
 found = true;  
 rowIndex = i;  
 colIndex = mid;  
 break;  
 }  
 else if (jaggedArray[i][mid] < searchId)  
 {  
 left = mid + 1;  
 }  
 else  
 {  
 right = mid - 1;  
 }  
 }  
  
 if (found)  
 {  
 break;  
 }  
 }  
  
 Stack<int> idStack = new Stack<int>();  
 for (int i = 0; i < jaggedArray.Length; i++)  
 {  
 for (int j = 0; j < jaggedArray[i].Length; j++)  
 {  
 idStack.Push(jaggedArray[i][j]);  
 }  
 }  
  
 int poppedId = idStack.Pop();  
  
 Console.WriteLine($"Binary Search: ID {searchId} found at [{rowIndex}][{colIndex}] = {found}");  
 Console.WriteLine($"Stack Pop: Last ID popped = {poppedId}");  
 }  
}

### **FINAL Output**



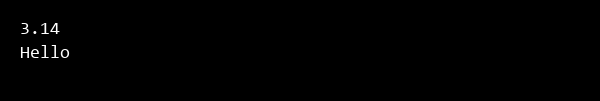
## **QUESTION 23**

23. Write a C# program to create a Product class (ID, Name, Price) and store o bjects in an array by price. Further, u se a Queue<T> to manage product processing (FIFO order).

### **Code Solution**

using System;  
using System.Collections.Generic;  
  
public class Product  
{  
 public int ID { get; set; }  
 public string Name { get; set; }  
 public decimal Price { get; set; }  
}  
  
public class Program  
{  
 public static void Main()  
 {  
 Product[] products = new Product[]  
 {  
 new Product { ID = 1, Name = "Laptop", Price = 999.99m },  
 new Product { ID = 2, Name = "Mouse", Price = 19.99m },  
 new Product { ID = 3, Name = "Keyboard", Price = 49.99m },  
 new Product { ID = 4, Name = "Monitor", Price = 199.99m }  
 };  
  
 Array.Sort(products, (x, y) => x.Price.CompareTo(y.Price));  
  
 Queue<Product> productQueue = new Queue<Product>();  
  
 foreach (Product product in products)  
 {  
 productQueue.Enqueue(product);  
 }  
  
 Console.WriteLine("Products processed in FIFO order (by sorted price):");  
 while (productQueue.Count > 0)  
 {  
 Product processedProduct = productQueue.Dequeue();  
 Console.WriteLine($"ID: {processedProduct.ID}, Name: {processedProduct.Name}, Price: {processedProduct.Price}");  
 }  
 }  
}

### **FINAL Output**



## **QUESTION 24**

24. Write a program to calculate the sum of the diagonal elements of a square matrix.

### **Code Solution**

using System;  
  
class Program  
{  
 static void Main()  
 {  
 int[,] matrix = {  
 {1, 2, 3},  
 {4, 5, 6},  
 {7, 8, 9}  
 };  
 int sum = 0;  
 int size = matrix.GetLength(0);  
 for (int i = 0; i < size; i++)  
 {  
 sum += matrix[i, i];  
 }  
 Console.WriteLine(sum);  
 }  
}

### **FINAL Output**

