**Lab Assignment 1 in C#**

**Question 1.**Imagine you are developing a basic calculator for a financial application. You need to calculate the total sum of all the transactions recorded in a day. Write a C# program to find the sum of all elements in an integer array using a loop.

Input: int[] transactions = {200, -150, 340, 500, -100};

**Answer 1.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of transactions: ");

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

            int[] transactions = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter transaction " + (i + 1) + ": ");

                transactions[i] = int.Parse(Console.ReadLine());

            }

            int total = 0;

            for (int i = 0; i < n; i++)

            {

                total += transactions[i];

            }

            Console.WriteLine("\nTotal sum of transactions: " + total);

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

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**Question 2**

You are working on an analytics tool that needs to find the average score of a class from a list of floating-point numbers. Create a C# program that calculates the average of values in a floating-point array using a loop.

Input: float[] scores = {85.5f, 90.3f, 78.4f, 88.9f, 92.1f};

**Answer 2.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of students: ");

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

            float[] scores = new float[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter score " + (i + 1) + ": ");

                scores[i] = float.Parse(Console.ReadLine());

            }

            float total = 0;

            for (int i = 0; i < n; i++)

            {

                total += scores[i];

            }

            float average = total / n;

            Console.WriteLine("\nAverage score of the class: " + average);

            Console.WriteLine("Developed by Mohit Singh");

            Console.ReadLine();

        }

    }

}

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**Question 3**

You are tasked with developing a feature for an inventory management system that finds the most expensive item in stock. Develop a C# program that finds the largest element in an integer array using a loop and if-else statements.

Input: int[] prices = {1500, 2300, 999, 3200, 1750};

**Answer 3.** namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of items in stock: ");

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

            int[] prices = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter price of item " + (i + 1) + ": ");

                prices[i] = int.Parse(Console.ReadLine());

            }

            int maxPrice = prices[0];

for (int i = 1; i < n; i++)

            {

                if (prices[i] > maxPrice)

                {

                    maxPrice = prices[i];

                }

            }

            Console.WriteLine("\nThe most expensive item costs: " + maxPrice);

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

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**Question 4**

You need to generate a report for a survey that counts the number of male and female participants based on their unique codes (even for males, odd for females). Write a C# program that counts the number of even and odd elements in an integer array using a loop and if-else statements.

Input: int[] participantCodes = {102, 215, 324, 453, 536};

**Answer 4.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of participants: ");

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

            int[] participantCodes = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter code for participant " + (i + 1) + ": ");

                participantCodes[i] = int.Parse(Console.ReadLine());

            }

            int maleCount = 0;

            int femaleCount = 0;

            for (int i = 0; i < n; i++)

            {

                if (participantCodes[i] % 2 == 0)

                {

                    maleCount++;

                }

                else

                {

                    femaleCount++;

                }

            }

            Console.WriteLine("\nNumber of male participants: " + maleCount);

            Console.WriteLine("Number of female participants: " + femaleCount);

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

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You are building a feature for an app that displays the recent search history in reverse order. Implement a C# program that reverses the elements of an integer array using a loop.

Input: int[] searchHistory = {101, 202, 303, 404, 505};

**Answer 5.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of search history items: ");

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

            int[] searchHistory = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter search history item " + (i + 1) + ": ");

                searchHistory[i] = int.Parse(Console.ReadLine());

            }

            Console.WriteLine("\nSearch history in reverse order:");

            for (int i = n - 1; i >= 0; i--)

            {

                Console.WriteLine(searchHistory[i]);

            }

            Console.WriteLine("Developed by Deepanshu Dixit.");

            Console.ReadLine();

        }

    }

}

**Output:** A screenshot of a computer

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You are developing a simulation tool where you need to adjust the measurements by a certain factor. Create a C# program that multiplies each element in an integer array by a specified factor using a loop.

Input: int[] measurements = {2, 4, 6, 8}; int factor = 3;

**Answer 6.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of measurements: ");

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

            int[] measurements = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter measurement " + (i + 1) + ": ");

                measurements[i] = int.Parse(Console.ReadLine());

            }

            Console.Write("Enter the adjustment factor: ");

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

            for (int i = 0; i < n; i++)

            {

                measurements[i] = measurements[i] \* factor;

            }

            Console.WriteLine("\nAdjusted measurements:");

            for (int i = 0; i < n; i++)

            {

                Console.WriteLine(measurements[i]);

            }

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

**Output:** A screenshot of a computer

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**Question 7**

 You are tasked with creating a search function for a library system that finds a specific book by its code. Write a C# program that searches for a specific value in an integer array using a loop and returns its index if found.

Input: int[] bookCodes = {101, 203, 304, 405, 506}; int searchCode = 304;

**Answer 7.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of book codes: ");

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

            int[] bookCodes = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter book code " + (i + 1) + ": ");

                bookCodes[i] = int.Parse(Console.ReadLine());

            }

            Console.Write("Enter the book code to search: ");

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

            int index = -1;

            for (int i = 0; i < n; i++)

            {

                if (bookCodes[i] == searchCode)

                {

                    index = i;

                    break;

                }

            }

            if (index != -1)

                Console.WriteLine("Book found at index: " + index);

            else

                Console.WriteLine("Book not found.");

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

OUTPUT:

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**Question 8**

 In an academic project, you need to identify the second smallest grade in a list of student grades. Develop a C# program that finds the second smallest element in an integer array using loops and sorting techniques.

Input: int[] grades = {56, 78, 89, 45, 67};

**Answer 8.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of students: ");

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

            int[] grades = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter grade " + (i + 1) + ": ");

                grades[i] = int.Parse(Console.ReadLine());

            }

            for (int i = 0; i < n - 1; i++)

            {

                for (int j = 0; j < n - i - 1; j++)

                {

                    if (grades[j] > grades[j + 1])

                    {

                        int temp = grades[j];

                        grades[j] = grades[j + 1];

                        grades[j + 1] = temp;

                    }

                }

            }

            if (n >= 2)

                Console.WriteLine("\nSecond smallest grade is: " + grades[1]);

            else

                Console.WriteLine("\nNot enough grades to determine the second smallest.");

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

**Output:**

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**Question 9**

 You are improving a system where you need to clean up duplicate entries from a list of IDs. Create a C# program that removes all duplicates from an integer array using loops and additional data structures.

Input: int[] ids = {102, 215, 102, 324, 215};

**Answer 9.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of IDs: ");

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

            int[] ids = new int[n];

            for (int i = 0; i < n; i++)

            {

                Console.Write("Enter ID " + (i + 1) + ": ");

                ids[i] = int.Parse(Console.ReadLine());

            }

            List<int> uniqueIds = new List<int>();

            for (int i = 0; i < n; i++)

            {

                if (!uniqueIds.Contains(ids[i]))

                {

                    uniqueIds.Add(ids[i]);

                }

            }

            Console.WriteLine("\nUnique IDs:");

            foreach (int id in uniqueIds)

            {

                Console.WriteLine(id);

            }

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

**Output:**

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**Question 10**

 You are developing a function that finds common elements in two different datasets for an analytics application. Write a C# program that finds the common elements between two integer arrays using loops.

Input: int[] dataset1 = {1, 2, 3, 4, 5}; int[] dataset2 = {3, 4, 5, 6, 7};

**Answer 10.**namespace LabAssignment1

{

    internal class Program

    {

        static void Main(string[] args)

        {

            Console.Write("Enter the number of elements in dataset1: ");

            int n1 = int.Parse(Console.ReadLine());

            int[] dataset1 = new int[n1];

            for (int i = 0; i < n1; i++)

            {

                Console.Write("Enter element " + (i + 1) + " of dataset1: ");

                dataset1[i] = int.Parse(Console.ReadLine());

            }

            Console.Write("Enter the number of elements in dataset2: ");

            int n2 = int.Parse(Console.ReadLine());

            int[] dataset2 = new int[n2];

            for (int i = 0; i < n2; i++)

            {

                Console.Write("Enter element " + (i + 1) + " of dataset2: ");

                dataset2[i] = int.Parse(Console.ReadLine());

            }

            List<int> commonElements = new List<int>();

            for (int i = 0; i < n1; i++)

            {

                for (int j = 0; j < n2; j++)

                {

                    if (dataset1[i] == dataset2[j] && !commonElements.Contains(dataset1[i]))

                    {

                        commonElements.Add(dataset1[i]);

                    }

                }

            }

            Console.WriteLine("\nCommon elements between the datasets:");

            if (commonElements.Count > 0)

            {

                foreach (int elem in commonElements)

                {

                    Console.WriteLine(elem);

                }

            }

            else

            {

                Console.WriteLine("No common elements found.");

            }

            Console.WriteLine("Developed by Mohit Singh.");

            Console.ReadLine();

        }

    }

}

**Output:**

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