

## Project Assignment #1

Write a C# program for the following project

Input: n: number of items.

$A_i$ : the items values (Not sorted) from  $i=1$  to  $n$

Output: The median of the values  $A_i$ .

The mode of the values  $A_i$ .

The range of the values  $A_i$ .

The first Quartile of the values  $A_i$ .

The third Quartile of the values  $A_i$ .

The P90 of the values  $A_i$ .

The interquartile of the values  $A_i$ .

The boundaries of the outlier region.

Determine whether an input value is an outlier or not.

```

using System;
using System.Linq;

class Program
{
    static void Main(string[] args)
    {
        // Read input values
        Console.Write("Enter the number of items: ");
        int n = int.Parse(Console.ReadLine());
        Console.WriteLine("Enter the items values:");
        double[] values = new double[n];
        for (int i = 0; i < n; i++)
        {
            values[i] = double.Parse(Console.ReadLine());
        }

        // Sort values
        Array.Sort(values);

        // Calculate median
        double median;
        if (n % 2 == 0)
        {
            median = (values[n / 2 - 1] + values[n / 2]) / 2;
        }
        else
        {
            median = values[n / 2];
        }
        Console.WriteLine("Median: " + median);

        // Calculate mode
        double mode = values.GroupBy(x => x)
                            .OrderByDescending(g => g.Count())
                            .Select(g => g.Key)
                            .First();
        Console.WriteLine("Mode: " + mode);

        // Calculate range
        double range = values.Last() - values.First();
        Console.WriteLine("Range: " + range);
    }
}

```

```

// Calculate quartiles
int q1Index = n / 4;
double q1 = n % 4 == 0 ? (values[q1Index - 1] + values[q1Index]) / 2 : values[q1Index];
Console.WriteLine("First Quartile: " + q1);
int q3Index = n * 3 / 4;
double q3 = n % 4 == 0 ? (values[q3Index - 1] + values[q3Index]) / 2 : values[q3Index];
Console.WriteLine("Third Quartile: " + q3);

// Calculate P90
int p90Index = n * 9 / 10;
double p90 = values[p90Index];
Console.WriteLine("P90: " + p90);

// Calculate interquartile range
double iqr = q3 - q1;
Console.WriteLine("Interquartile Range: " + iqr);

// Calculate outlier boundaries
double lowerOutlierBound = q1 - 1.5 * iqr;
double upperOutlierBound = q3 + 1.5 * iqr;
Console.WriteLine("Outlier Boundaries: [" + lowerOutlierBound + ", " + upperOutlierBound + "]");

// Check if input value is an outlier
Console.Write("Enter a value to check if it's an outlier: ");
double inputValue = double.Parse(Console.ReadLine());
if (inputValue < lowerOutlierBound || inputValue > upperOutlierBound)
{
    Console.WriteLine(inputValue + " is an outlier.");
}
else
{
    Console.WriteLine(inputValue + " is not an outlier.");
}
}
}

```

Enter the number of items: 10

Enter the items values:

5

8

9

6

7

1

2

5

6

10

Median: 6

Mode: 5

Range: 9

First Quartile: 5

Third Quartile: 8

P90: 10

Interquartile Range: 3

Outlier Boundaries: [0.5, 12.5]

Enter a value to check if it's an outlier: 9

9 is not an outlier.

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