# Week # 2 Machine Problems

## Instructions:

1. Fork this Github repository: https://github.com/neilvillareal/DataStructureActivities
2. Clone your forked repository to your local machine.
3. Open the solution in Visual Studio or Visual Studio Code
4. Complete  or implement the requirements for the following functions specified below. Look for the Week 2 Activities on the repository. Choose the language you would like to use (C# or Java).
5. Use the main method of the program to invoke the functions and evaluate the output. Or run the test cases in the Test Explorer of the attached test project.
6. Once completed, commit and push your code to your Github repo on or before Thursday (September 23, 2021 12nn).
7. For inquiries, send it to my email: neilvillareal@gmail.com

Complete the functions that perform basic statistics. The functions should accept an array of positive integers and return expected result specified below:

**GetSum(n)**

n = { 87, 67, 43, 45, 67, 34, 89, 54, 87, 67 }, therefore, **GetSum(n)** = 640
n = { 92, 90, 84, 75, 68, 34, 56, 87, 44, 56, 92, 90, 91, 90, 88 }, therefore, **GetSum(n)** = 1137

**GetMean(n)** *NOTE: convert the result to the nearest two decimal places*

n = { 87, 67, 43, 45, 67, 34, 89, 54, 87, 67 }, therefore, **GetMean(n)** = 64.00
n = { 92, 90, 84, 75, 68, 34, 56, 87, 44, 56, 92, 90, 91, 90, 88 }, therefore, **GetMean(n)** = 75.80

**GetMedian(n)**

n = { 87, 67, 43, 45, 67, 34, 89, 54, 87, 67 }, therefore, **GetMedian(n)** = 67
n = { 92, 90, 84, 75, 68, 34, 56, 87, 44, 56, 92, 90, 91, 90, 88 }, therefore, **GetMedian(n)** = 87

**GetMode(n)**

n = { 87, 67, 43, 45, 67, 34, 89, 54, 87, 67 }, therefore, **GetMode(n)** = 67
n = { 92, 90, 84, 75, 68, 34, 56, 87, 44, 56, 92, 90, 91, 90, 88 }, therefore, **GetMode(n)** = 90

**GetMaxValue(n)** *Note: returns the highest value in the range of the array*

n = { 87, 67, 43, 45, 67, 34, 89, 54, 87, 67 }, therefore, **GetMaxValue(n)** = 89
n = { 92, 90, 84, 75, 68, 34, 56, 87, 44, 56, 92, 90, 91, 90, 88 }, therefore, **GetMaxValue(n)** = 92

# ! IMPORTANT NOTES:

### Mean

The **arithmetic mean** is the most common measure of central tendency. It is computed by summing all the scores (sigma or **Σ**) and dividing by the number of scores (N):

$$\overline{X} = \frac{\sum X}{N}$$

*Where X is the mean, ∑x is the addition or summation of all scores, and N is the number of cases.*

- Example of calculating mean with formula:

Given the scores of first year students in a Statistics test, calculate the mean.

10 5 9 8 6 5 9 8 7 6 5 6

1. To calculate the mean, first add all scores; that is,

   10+5+9+8++6+5+9+8+7+6+5+6= 84

2. Then divide the result by the number of cases (the number of scores): 12
3. Applying the formula:

   *X= 84/12= 7*

Thus, the mean or average score of this Statistics test is 7.

### Median

The median is the **middle value in a distribution**. It is the point at which half of the scores are above, and half of the scores are below. It is not affected by outliers, so the median is preferred as a measure of central tendency when a distribution has extreme scores.

To calculate the median, values are sorted from lowest to highest. When there is an odd number of scores, the median is simply the middle score. When there is an even number of numbers, the median is the mean of the two middle numbers.

### Mode

The mode is the **value with the largest frequency** in a table. In a histogram, it would represent the highest point or peak of the distribution. For example, if these were the scores of first year students in a Statistics test:

10 5 9 8 6 5 9 8 7 6 5 6

The mode is 6- this is the most frequent score.

Reference: https://latrobe.libguides.com/maths/central-tendency