This is a C++ Warm-up assignment for experienced C++ Programmers.

Create a program that will determine the following characteristics from an input list of numbers:

1. Minimum Number
2. Maximum Number
3. Mean (Arithmetic average)
4. Median (Middle number)
5. Mode (The most common number)

This program must use the following from the Standard Template Library:

- vector (Why vectors? You can change their size at Runtime based on the user's input)
- sort( ) (Please use the built-in function, do NOT write your own)
    - www.cplusplus.com Explains how to use the sort( ) function

This program must use at least once each of the following C++ features:

- A function that have coded, not a built-in one. (Hint: I did the compare for sort() rather than use the default compare function.)
- A for loop
- A while or do-while loop (Normally to validate the user's input)
- A range based for loop
- iterators are not needed, nor recommended.

This program requires a test plan. Inputs to test every aspect of your code along with their precomputed output. A spread sheet might be a useful tool here.

Hints:

See my sample output to help guide your design.

The user will tell you how many numbers are coming. So create the vector of the right size and use subscript notation to put the numbers into the vector. Do NOT use emplace_back() or worse, push_back() for this.

```
numberVector[ i ] = inputValue;
```

Enter all the numbers and store them one at a time into a vector (list). Then use range based for loop to determine the Min, Max and sum of the list.

Sort the list. Then create a second vector (counter) whose size is the Max you just figured out. Use that to count the frequency of each number from the list in the original vector. Yep, another range based for loop to go through the list and increment the right element of the counter vector.

For the mode, you will need to scan the counter list looking for the Maximum again. Here is the trick, you need a real for loop because you need to know and save the index where that maximum happened. That saved index is them de you are looking for. Determining multiple modes is harder and not required for this assignment.

Simple Version:

```
Howard A Miller                        CIST00B Spring 2020


Minimum, Maximum, Mean, Median and Mode Calculator


How many numbers are in your list (1 to 100)? 0

Hey come on!  The list must have at least 1 number!


How many numbers are in your list (1 to 100)? 101

Really!  You are prepared to enter 101 numbers?  I don't think
so!


How many numbers are in your list (1 to 100)? 7

For number 1, enter an integer between 1 and 1000: 0

Please try again!

For number 1, enter an integer between 1 and 1000: 1001

Please try again!

For number 1, enter an integer between 1 and 1000: 1
```

```
For number 2, enter an integer between 1 and 1000: 876
For number 3, enter an integer between 1 and 1000: 451
For number 4, enter an integer between 1 and 1000: 2
For number 5, enter an integer between 1 and 1000: 11
For number 6, enter an integer between 1 and 1000: 451
For number 7, enter an integer between 1 and 1000: 16

The list of numbers has the following characteristics:
The Minimum is: 1
The Maximum is: 876
The Mean is: 258.286
The Median is: 16
The Mode is: 451

Program ended with exit code: 0
```

Fancy Version:

```
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Minimum, Maximum, Mean, Median and Mode Calculator
with extra polish and multimodal support.

How many numbers are in your list (1 to 100)? 12

Your list may have numbers between 1 and 1000.
```

```
Enter the 1st number: 451

Enter the 2nd number: 451

Enter the 3rd number: 758

Enter the 4th number: 758

Enter the 5th number: 1

Enter the 6th number: 17

Enter the 7th number: 17

Enter the 8th number: 345

Enter the 9th number: 5

Enter the 10th number: 345

Enter the 11th number: 11

Enter the 12th number: 0

Please enter a valid number between 1 and 1000!

Enter the 12th number: 12


The list of numbers entered has the following characteristics:

The Minimum is: 1

The Maximum is: 758

The Mean is: 264.25

The Median is: 345

This list is multimodal.  There are 4 modes.  The modes are: 17,
345, 451 and 758.


Program ended with exit code: 0
```

Submission:

Please copy the output in to a simple text editor. Set it to a mono-spaced font (courier for example) and then save the output as a .txt file. Upload the source code file (.cpp), the test plan (.txt) and the output file (.txt) in one submissions.