# CASIO
# eLearning Activities

## Measures of Central Tendency

We have worked with measures of central tendency including mean, median, and mode. We have also looked at range using maximum and minimum values, upper and lower quartiles in box-and-whisker plots, and interquartile range. Here is a brief review of the terms with a set of data given.

Data**: 2, 4, 9, 3, 7, 3, 11, 2, 10, 3, 1, 20, 16**
There are 13 items in the set. We should arrange them in order, low to high, to find some of the values needed.

Arranged data: 1, 2, 2, 3, 3, 3, 4, 7, 9, 10, 11, 16, 20 (Be sure to count to make sure you have them all.)

Number of items: 13

Minimum value: 1

Maximum value: 20

Range (subtract low from high; 20 - 1): 19

Mean (find the average; add all items and divide by the number of items) : $\frac{sum}{\#of\ items} = \frac{91}{13} = 7$

Median (find the middle of the arranged list 1, 2, 2, 3, 3, 3, 4, 7, 9, 10, 11, 16, 20) : 4

Mode (the most frequently occurring item; there may be none, one, or more than one mode): 3

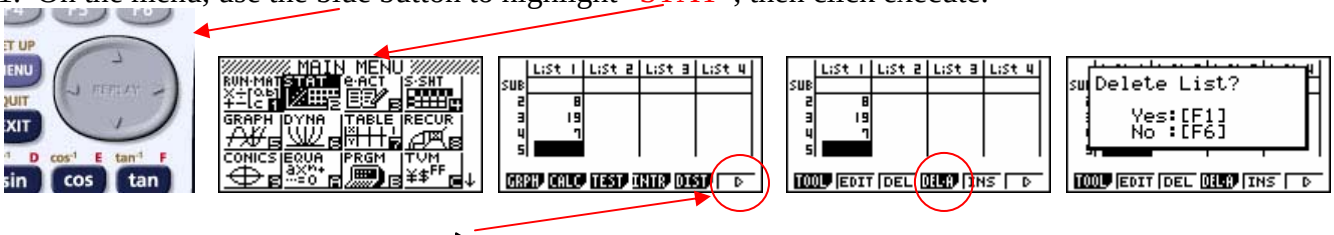
Lower quartile (the "median" of the lower half 1, 2, 2, 3, 3, 3, 4, 7, 9, 10, 11, 16, 20): 2 ½
2 ½

Upper quartile (the "median" of the upper half 1, 2, 2, 3, 3, 3, 4, 7, 9, 10, 11, 16, 20): 10 ½
10 ½

Interquartile range (subtract lower quartile from upper quartile; 10 ½ - 2 ½ = 8): 8

This information can be found easily using the calculator. Once the data is entered, one click does it all!

1. On the menu, use the blue button to highlight "STAT", then click execute.



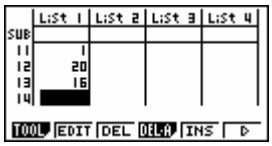

If data is already there, click on the ▷ (or F6) at the bottom right of the screen. Then "DEL-A" (or F4) and F1 to clear the data. Key strokes: ▶ EXE F6 F4 F1

2. Now enter the data in any order. Just use the order as it is given. Be sure to put in all 13.

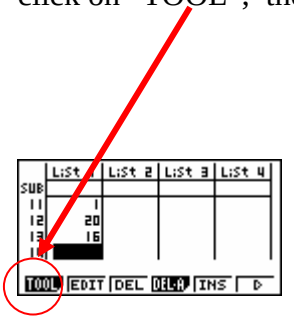
**Data: 2, 4, 9, 3, 7, 3, 11, 2, 10, 3, 1, 20, 16**

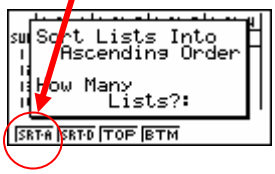
Press 2, execute, 4, execute, etc. until all numbers are entered. The last one should be at level 13.

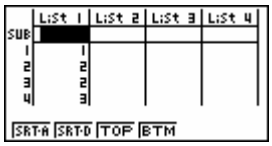
[2] [EXE] [4] [EXE] [9] [EXE] [3] [EXE] [7] [EXE] [3] [EXE] [1] [1] [EXE] [2] [EXE] [1] [0] [EXE] [3] [EXE] [1] [EXE] [2] [0] [EXE] [1] [6] [EXE]




4. If you want the data sorted in order from low to high, click on "TOOL", then on "SRT-A", then on "1", execute (for how many lists), then "1", execute (for which list). The data is now sorted low to high. Click "exit". Use the blue button to scroll up to the top is you'd like to see the beginning of the list. You may skip this step and go directly to step 5.

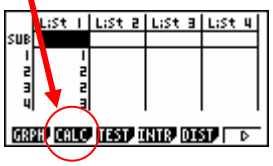


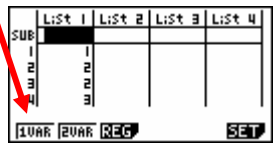



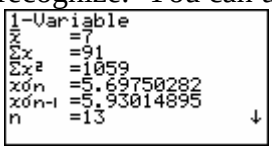

[F1] [F1] [1] [EXE] [1] [EXE]

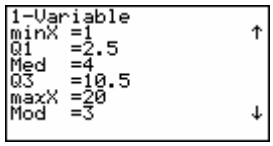
5. Click the ▷ one more time. You will see the list with options at the bottom. Click on "CALC", then on "1 VAR". [EXIT] [F6] [F2] [F1]

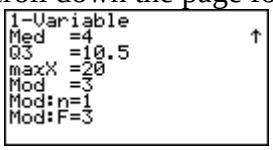



6. You will now have a screen with lots of symbols and information. There are several you will need to recognize. You can use the blue button to scroll down the page for more.




Here are the pieces you need to know.

$\bar{x}$ is the mean.

$\Sigma x$ means the sum of all the values.

$n$ is the number of items.

**min*x*** is the minimum value entered

**max*x*** is the maximum value entered.

**Q1** is the lower quartile..

**Med** is the median.

**Q3** is the upper quartile.

**Mod** is the mode.

**Practice: Use the calculator to find the following information about the given data.**

**1. Data: 4, 7, 5, 8, 11, 5, 2, 4, 9, 10**

| | |
|---|---|
| **Number of items:** | **Maximum:** |
| **Mean:** | **Range:** |
| **Median:** | **Lower quartile:** |
| **Mode:** | **Upper quartile:** |
| **Minimum:** | **Interquartile range:** |

**2. Data: 35, 67, 17, 25, 35, 28, 40**

| | |
|---|---|
| **Number of items:** | **Maximum:** |
| **Mean:** | **Range:** |
| **Median:** | **Lower quartile:** |
| **Mode:** | **Upper quartile:** |
| **Minimum:** | **Interquartile range:** |

**3. Data: 180, 223, 199, 145, 201, 175, 166, 185, 150**

| | |
|---|---|
| **Number of items:** | **Maximum:** |
| **Mean:** | **Range:** |
| **Median:** | **Lower quartile:** |
| **Mode:** | **Upper quartile:** |
| **Minimum:** | **Interquartile range:** |

**For the next 3 problems with a set A of data, find the mean and the median.**
**Then find the same information for set B which has one different number added to the list.**
**What number is different?**
**How did it affect the mean from set A to set B?**
**How did it affect the median?**
**Which one, mean or median, best represents the data in the set B? Why?**

**4. Data:**

**Set A: 78, 94, 82, 87, 85, 91, 88, 92**

**Set B: 78, 94, 82, 87, 85, 91, 88, 92, 0**

**5. Data:**

**Set A: 12, 6, 7, 4, 10, 3, 6**

**Set B: 12, 6, 7, 4, 10, 3, 6, 92**

**6. Data:**

**Set A: 21, 22, 21, 24, 22**

**Set B: 21, 22, 21, 24, 22, 100**

**What application might this have related to your grades in class?**