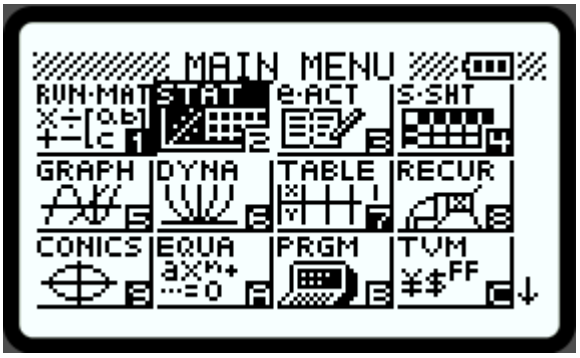
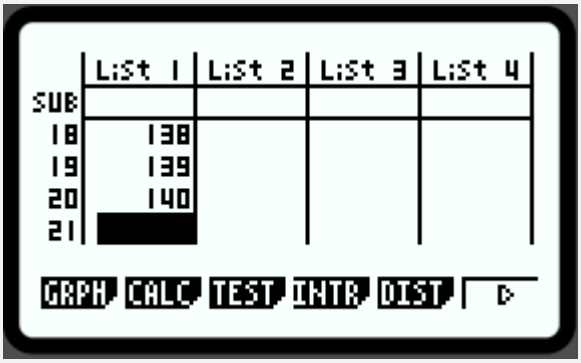
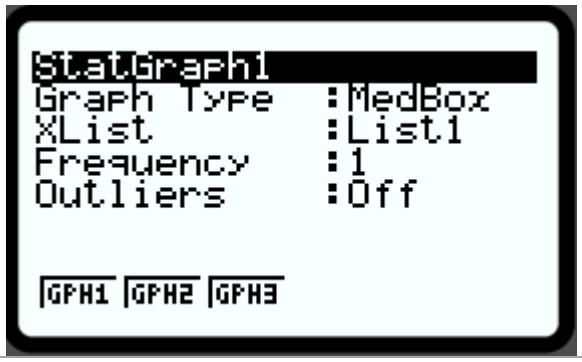
IM Algebra 1 – Unit 1: CASIO Technology Use at a Glance

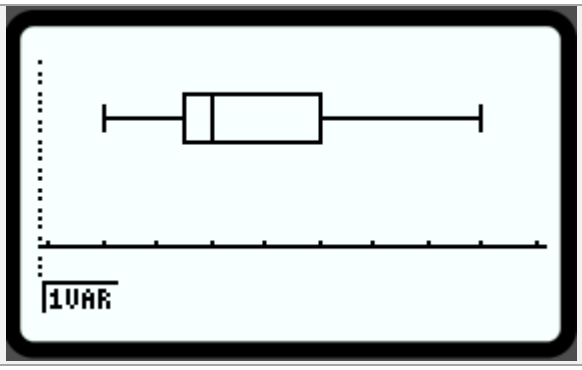
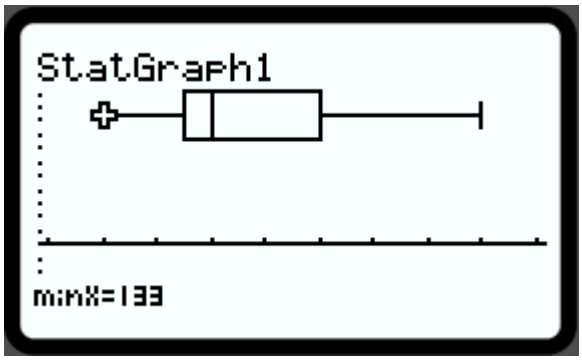
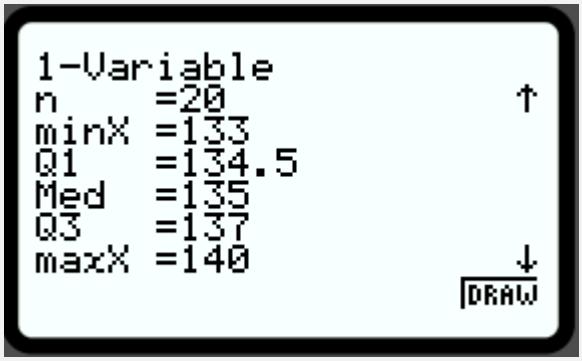
Unit 1 – One-Variable Statistics

Unit 1: One-Variable Statistics	
Spreadsheet Technology Required	Lessons 9, 10, 12, 14
Spreadsheet Technology Recommended	Lesson 16

Lesson 9 – Creating a Box Plot from a Data Set

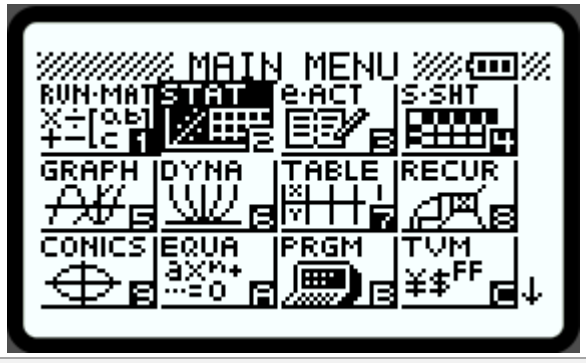
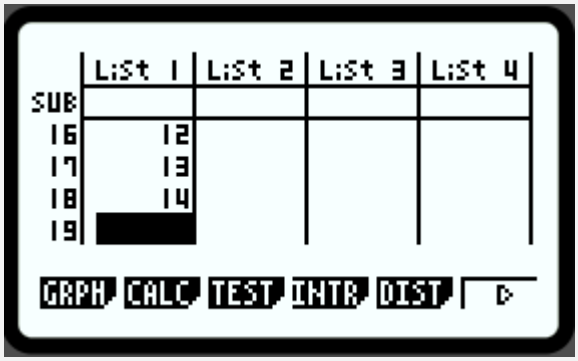
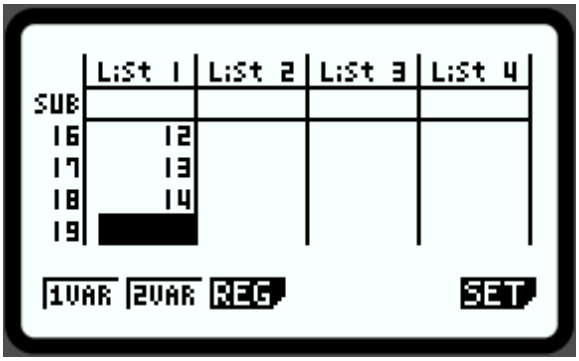
(Example: IM Practice Problem 2 – From Website)

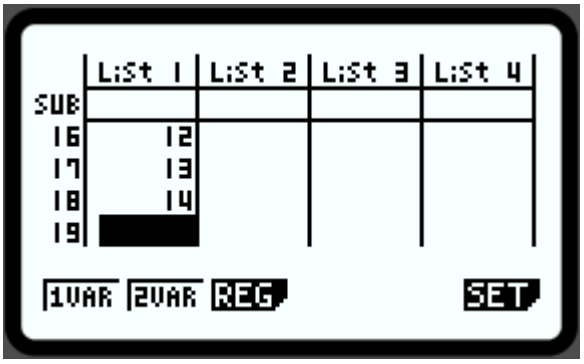
1. Press MENU 2 for STAT	
2. Enter Data in **List 1**. 3. Once complete, Press F1 **- GRPH** menu.	
4. Users can define types of stat graph presets for **GPH1**, **GPH2**, and **GPH3**. Default is a Box Plot for **GPH1**. To verify or to change these preferences, press F6 **- SET**. Shown are the default settings for a box plot for **GPH1**. Press EXIT to return to the graph page.	

5. Next, press F1 **- GPH1** to display the Box Plot.	
6. There are 2 ways to know the exact numbers of the five-number summary. One way is to use the Trace command. Press **SHIFT** F1 -**Trace**. **MinX** will be displayed. Arrow right for each value. Press EXIT to leave the Trace command.	
7. The other way is to press F1 **-1VAR** to view the stat results. Scroll down to find the five-number summary, boxed in blue to the right, which are the 5 values represented in the box plot. 8. To return to the box plot graph, press F6 **- DRAW**. 9. Press EXIT to return to the data list.	

Lesson 10 – Finding Mean and Median of a Data Set

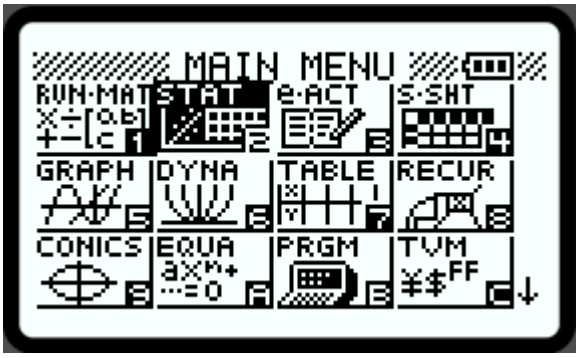
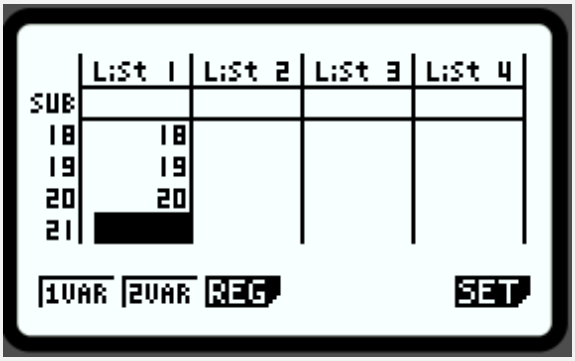
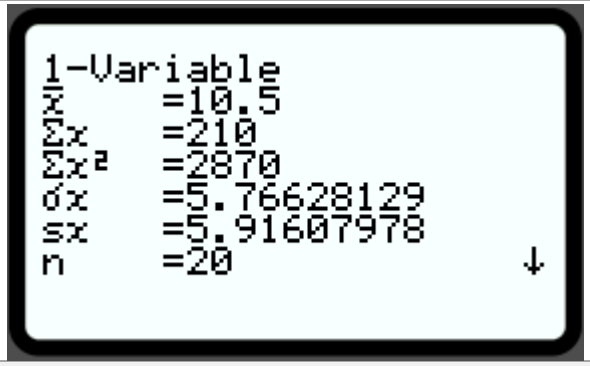
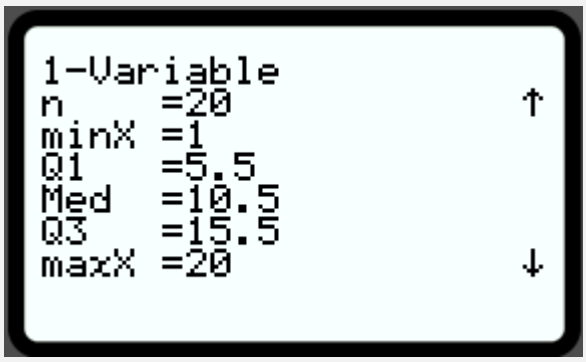
(Example: IM Lesson 10.2: Separated by Skew)

1. Press MENU 2 for STAT application.	
2. Enter Data in **List 1**. **3.** Once complete, Press F2 to select **CALC** menu.	
4. Press F1 **- 1VAR**.	

5. The 1-Variable stat calculation values will be displayed. Scroll down with the down key to find specific results. In this case, **mean ($\bar{x}$)** and **median (Med)** were desired. **ANS: Mean = $\bar{x}$ = 10** **Median = Med = 10**	
6. Press EXIT to return to the data list. Repeat directions above to alter the data to investigate effect skew has on the mean and median of the data sets required to finish this task.	

Lesson 12 – Finding the Standard Deviation from a Data Set

(Example: IM 12.3: Investigating Variability)

1. Press MENU 2 for STAT application.	
2. Enter Data in **List 1**. 3. Once complete, Press F2 **- CALC**. 4. Then press F1 **- 1VAR** to calculate 1-variable stat results.	
5. Scroll down through the results to find the mean, standard deviation, median, and **interquartile range (IQR)** for Question 1.	
6. Q1.) **ANS: Mean = x̄ = 10.5** **Std. Dev. = σx = 5.77** **Median = Med = 10.5** **IQR = Q3-Q1 = 10** 7. Press EXIT to return to the data list. Repeat directions above to alter the data to answer the remaining questions 2-5. (Answers will vary)	

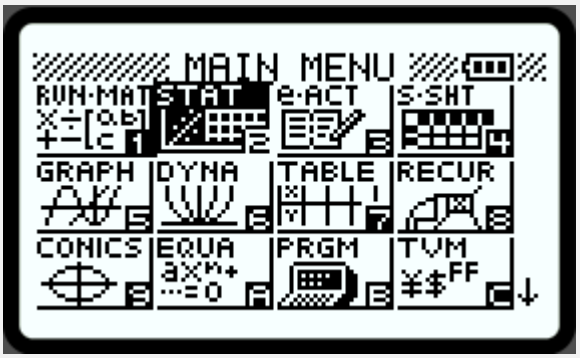
Lesson 14 – Investigating Outliers in a Data Set

(Example: IM 14.2 – Investigating Outliers Activity with Health Care Spending Data Q1&2)

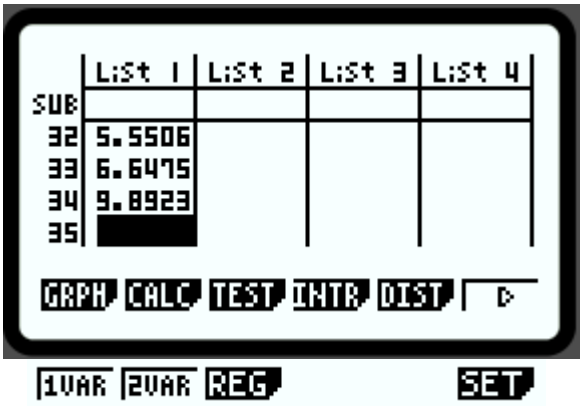
To determine whether a data point could be considered an outlier, we need to know if the value of the data point **is less than** the value of **Q1 - 1.5(IQR),** or if the value of the data point **is greater than** the value of **Q3 + 1.5(IQR)**. If either occur, those values are outliers.

We need to know the values of Q1, Q3, and the IQR, to determine if our data point value is an outlier. Often, we will need to analyze the list of data points to first find these values. This is the case for this IM Activity/Task. Steps 1 through 6 reviews finding these values from a data list. If you already know the values for Q1, Q3, and the IQR; or have the box plot, follow steps 7-11 to determine if a value is an outlier.

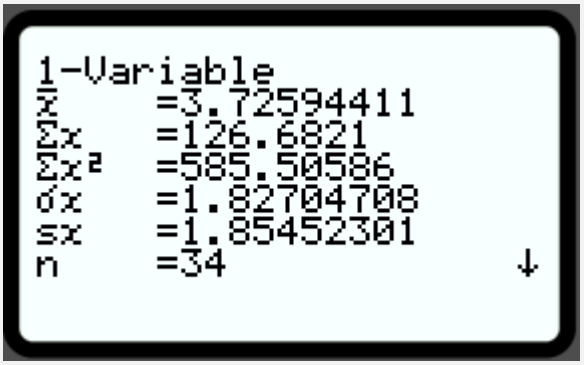
1. Press MENU 2 for STAT application.



2. Enter Data in **List 1**.
3. Once complete, Press F2 **- CALC**.
4. Then press F1 **- 1VAR**.

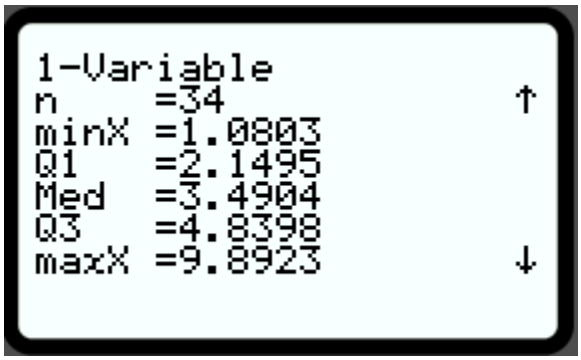


5. Scroll down through the results to find the mean, standard deviation, and five-number summary asked for Question 1.

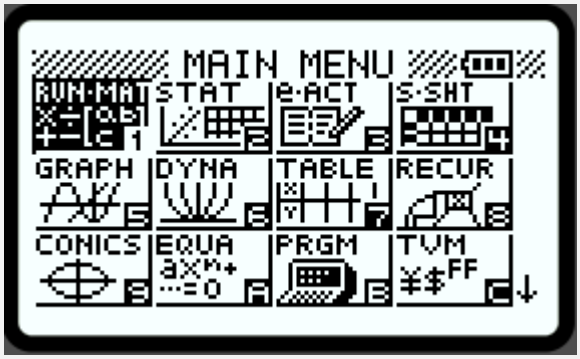


6. **Question 1 ANSWERS:**
   Mean = $\bar{x}$ = 3.7259

   Std. Dev. = σx = 1.827
   Minimum = MinX = 1.0803
   Quartile 1 = Q1 = 2.1495
   Median = Med = 3.4904
   Quartile 3 = Q3 = 4.8398
   Maximum = MaxX = 9.8923



7. For Question 2, they want us to determine if a point is an outlier. We will need to go to **Run-Matrix** to perform calculations. Press MENU 1 for RUN·MAT application.



8. Calculate the **IQR** for your Data.

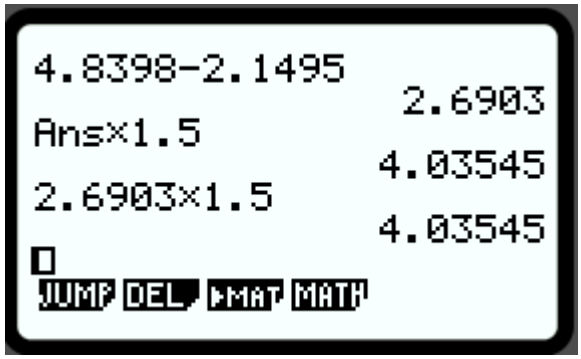
   IQR = Q3 – Q1

   For this data, the IQR is 2.6903.

   Next, we need the value of **1.5(IQR)**

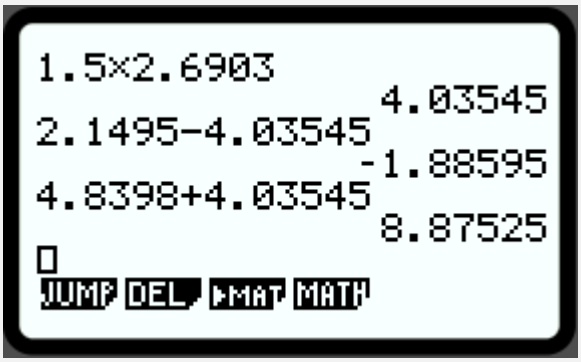
   For this data, the **1.5(IQR)** is 4.03545.

   NOTE: Highlight the above answer then **EXE** will copy down quickly. For the previous answer, use **SHIFT (-)** as you type.



9. Next, determine the value of **Q1-1.5(IQR)**. Any data value less than this is an outlier. (For this data, **Q1-1.5(IQR) = -1.88595**)

10. Next, determine the value of **Q3+1.5(IQR)**. Any data value less than this is an outlier. (For this data, **Q3+1.5(IQR) = 8.87525**)

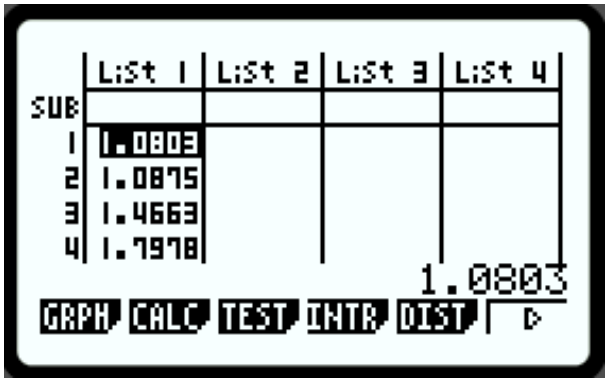


11. For this data, they want to know if the maximum value in the data set, representing the United States, is an outlier.

    Since that value is greater than the value of **Q3+1.5(IQR)**, the data value is an outlier.

    Question 2 ANSWER: Yes, for the data set, Q3+1.5(IQR) = 8.87525. The US data value, 9.8923, is greater than 8.87525 so that value is an outlier.

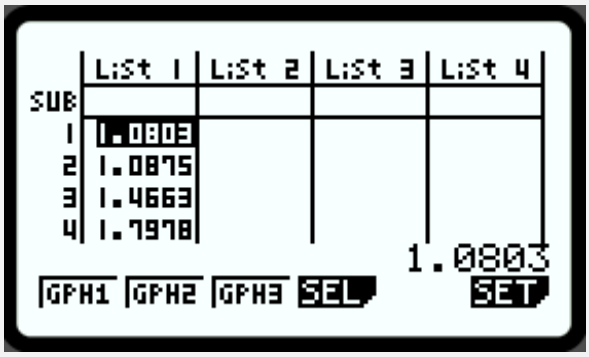
    We can visually verify outliers by viewing the box plot. Press MENU 2 for STAT app.



12. Next, press F1 - **GRPH**, and then view the graph settings by pressing F6 - **SET**. Shown directly below are the default settings for a box plot for **GPH1**. Outliers is turned Off.

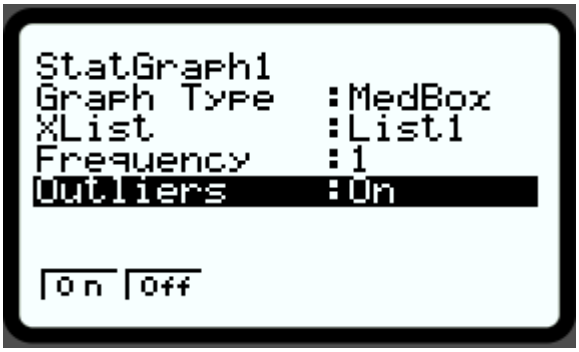
13. Turn the Outlier setting on by going down until it is highlighted and pressing F1 - **On**.

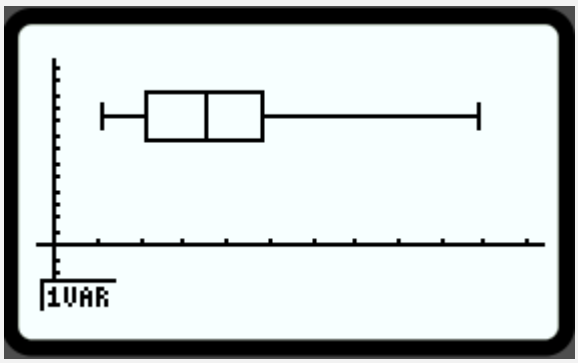
14. After changing the setting, press EXIT to return to the graph page. Press F1 - **GPH1** to view the box plot.

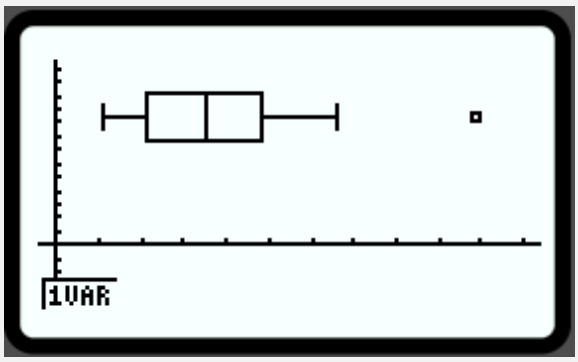


Outlier Setting Off

Outlier Setting On



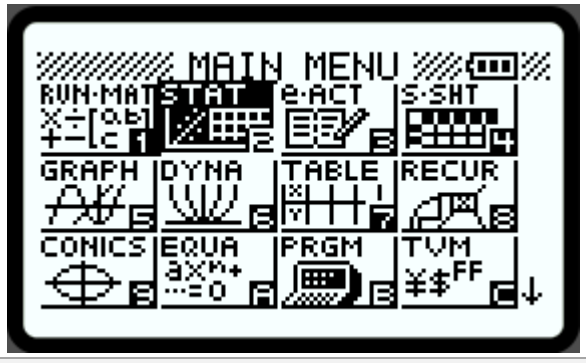




Lesson 16 – Analyzing Data (Multiple Lists)

(Example: IM 16.3 – Heights and Handedness: (Data Table in Blackline Masters))

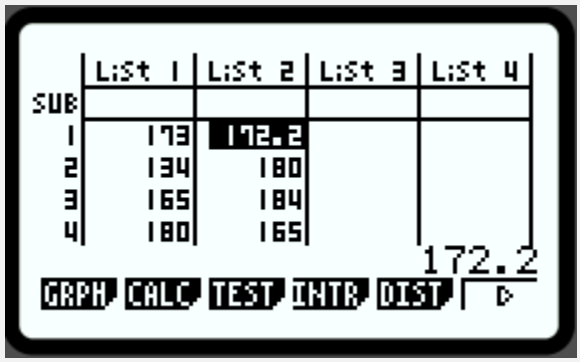
1. This activity involves analyzing data sets to make predictions. A data table containing handedness and heights is provided In the "Blackline Masters" PDF for this lesson. By comparing data analysis for left-handed people vs right-handed people, we can determine if there is correlation between handedness and heights. Press MENU 2 for STAT



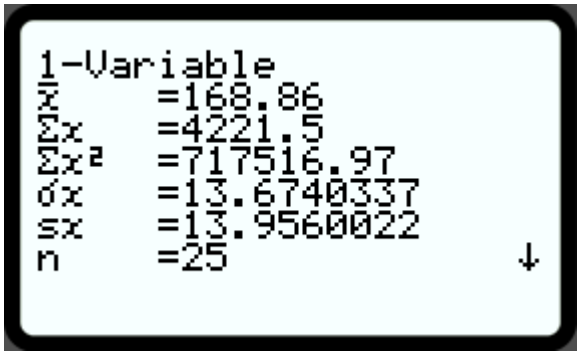
2. Enter height data for left-handed people in **List 1**. Then enter height data for right-handed people in **List 2**.

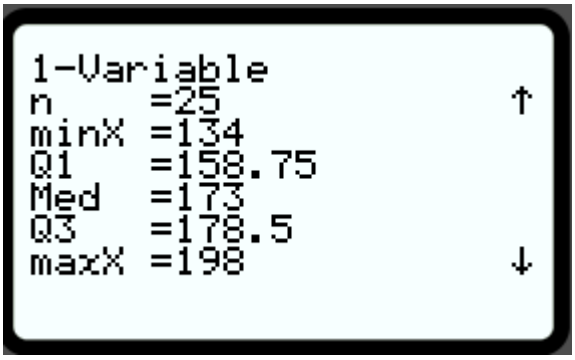
   NOTE: May be better to find data from classes, your school, etc, or skip "suspect" data in the IM data list provided.

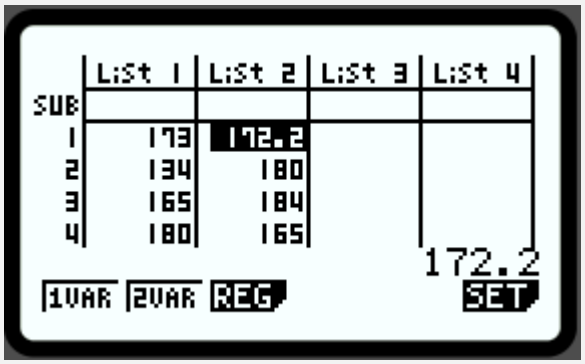
3. Once complete, Press F2 to select **CALC** menu.



4. Press F1 **- 1VAR**. The results shown are for List 1; Left-handed people's heights. The calculator defaults to List 1 for a one variable data analysis.





5. Press [EXIT] to return to the data list. Next we want to see the data analysis for **List 2**, the heights of right handed people. 6. Press [F6] **- SET**.	
7. Press [F1] **- LIST**.	
8. In the pop up window, enter [2] and press **EXE**.	

9. Now, **1-VAR** will use data from **List 2**.	
10. Press EXIT to return to the data list. Then press F1 **- 1VAR**. The results shown now are for **List 2**; right-handed people's heights; because we changed the list in settings. 11. Have students draw conclusions from the data results they find. They can create a dual box plot on paper from the five-number summary or display each box plot on their calculator. The average values and standard deviation of the data can also be used in their analysis/conclusions.