Measures of central tendency: mean, median, mode, midrange.

Mean: average value. **Median**: middle value. **Mode**: most frequent value. **Midrange**: Average of the two extremes: max and min values.

Sample 1: 0, 11, 17, 28, 40.		
Mean	$\bar{x} = \frac{\sum x}{n}$	$\bar{x} = \frac{0 + 11 + 17 + 28 + 40}{5} = 19.2$
Median	Middle value	0, 11, 17, 28, 40. $med = 17$
Mode	Most freq value	None
Midrange	$= \frac{max + min}{2}$	$\frac{40 + 0}{2} = 20$

Sample 2: 6, 9, 13, 14, 20, 20, 20, 24, 33, 33		
Mean	$\bar{x} = \frac{\sum x}{n}$	$\bar{x} = \frac{6+9+13+14+20+20+20+24+33+33}{10} = 19.2$
Median	Middle value	6, 9, 13, 14, 20, 20, 20, 24, 33, 33 $med = \frac{20+20}{2} = 20$
Mode	Most freq value	20
Midrange	$= \frac{max + min}{2}$	$\frac{33 + 6}{2} = 19.5$

Measures of Variation: Range, Variance, Standard deviation, Coefficient of Variation.

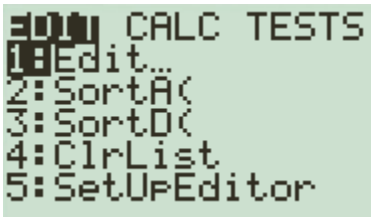
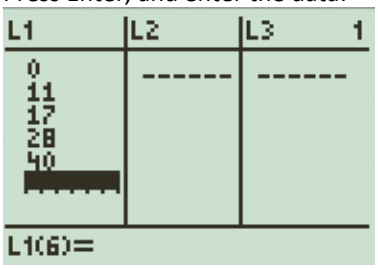
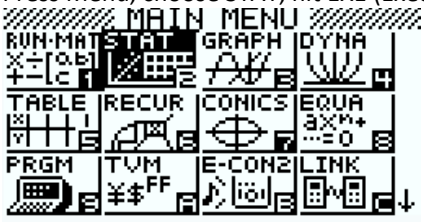
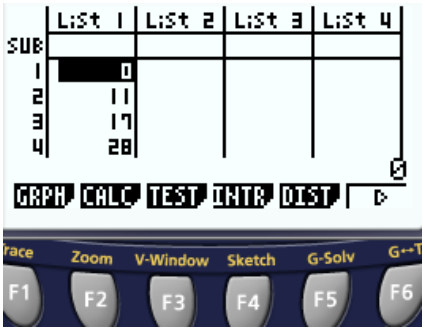
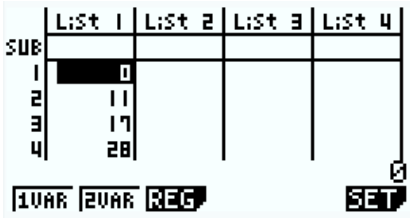
Sample 1: 0, 11, 17, 28, 40.		
Variance	$s^2 = \frac{\sum(x - \bar{x})^2}{n - 1}$	$s^2 = \frac{(0 - 19.2)^2 + (11 - 19.2)^2 + (17 - 19.2)^2 + (28 - 19.2)^2 + (40 - 19.2)^2}{4} = 237.7$
Standard Deviation	$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$	$s = \sqrt{\frac{(0-19.2)^2+(11-19.2)^2+(17-19.2)^2+(28-19.2)^2+(40-19.2)^2}{4}} = 15.4$
Coefficient of Variation	$CV = \frac{s}{\bar{x}} \cdot 100$	$CV = \frac{15.4}{19.2} \cdot 100 = 80.2\%$
Range	Max-Min	$40 - 0 = 40$

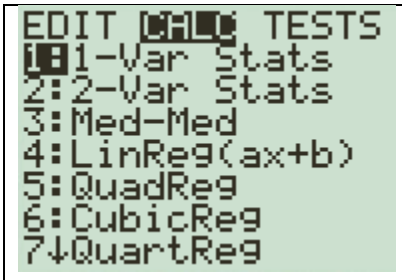
Using the alternative formula for Variance and the Standard deviation. Both formulas are algebraically equivalent:

Sample 2: 6, 9, 13, 14, 20, 20, 20, 24, 33, 33		
Variance	$s^2 = \frac{n\sum x^2 - (\sum x)^2}{n(n-1)}$	sum of $x^2 = 6^2 + 9^2 + 13^2 + 14^2 + 3(20^2) + 24^2 + 2(33^2) = 4436$ sum of $x = 6 + 9 + 13 + 14 + 3(20) + 24 + 2(33) = 192$ $s^2 = \frac{10(4436) - (192)^2}{10(9)} = 83.3$
Standard Deviation	$s = \sqrt{\frac{n\sum x^2 - (\sum x)^2}{n(n-1)}}$	$s = \sqrt{\frac{10(4426) - 192^2}{10(9)}} = 9.1$
Coefficient of Variation	$CV = \frac{s}{\bar{x}} \cdot 100$	$CV = \frac{9.1}{19.2} \cdot 100 = 47.4\%$
Range	Max-Min	$33 - 6 = 27$

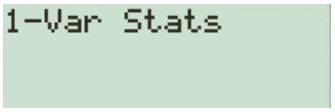
Notice that while both samples have the same mean, the variation within the dataset is higher for sample 1.

Sample 1 in **TI 83** and **Casio fx 9750**

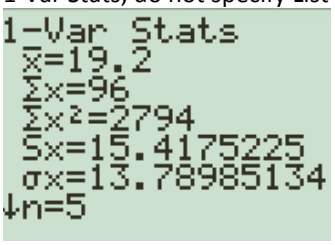
TI 83 similar to TI84	**Casio fx 9750**
Press STAT  Press Enter, and enter the data:  Press STAT again, and use the arrow keys:  ….to move over CALC:	Press Menu, choose STAT, hit EXE (Execute):  Enter the dataset in List 1:  Press F2, it is the key that corresponds to CALC: 



Press Enter:



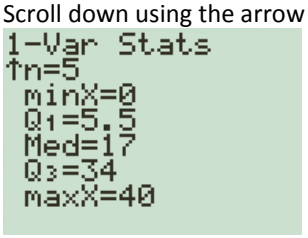
We are working on one variable Statistics and the data was entered in List 1; therefore, keep 1-Var Stats, do not specify List 1: Press Enter again:



Results:

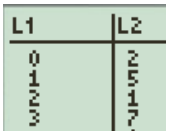
$\bar{x}$: Sample mean
Sx: *Sample Standard Deviation*
σx: *population Standard Deviation*

Scroll down using the arrow keys to obtain:



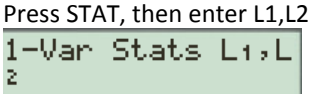
$MinX$: *minimum*
Q_1: *First Quartile*
Med: *median*
Q_3: Third Quartile
MaxX: maximum

For two lists:



L1	L2
0	2
1	5
2	1
3	7

Press STAT, then enter L1,L2:



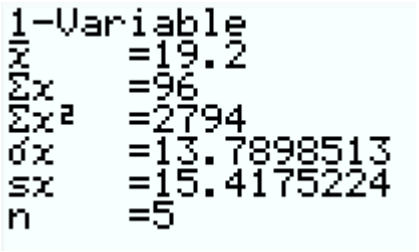
Press enter to obtain 1-Var Stats

We are working on 1 Variable Statistics. We need to check SET, the corresponding key is F6. SET deals with how the user set up the lists. We have only List 1; therefore, press F6:

This is what we need. The frequency of each data value on list 1 is 1. This is not a frequency table; in that case we would have List 2 updated. So, if you see this:

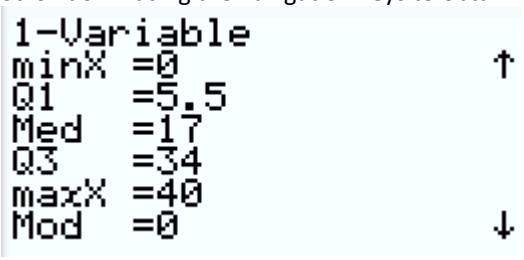
It means that you have a List2 of frequencies. Since we don't have it in this case, press F1 which correspond to 1. Now press EXIT key,

And then F1 for 1 Var.



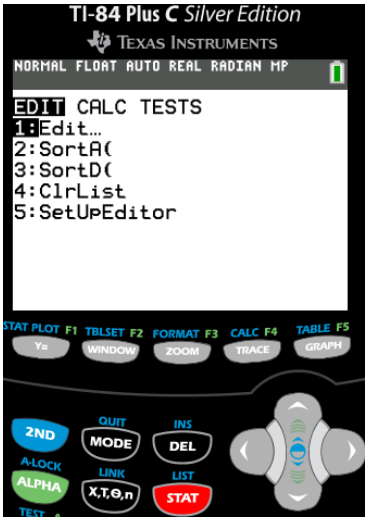
(Description of variables same as TI, see left column)

Scroll down using the navigation keys to obtain:

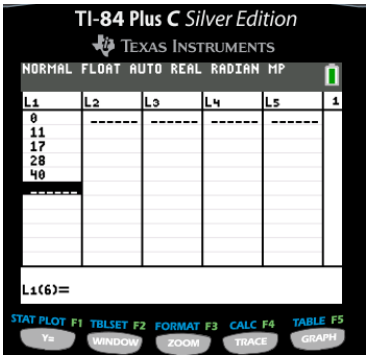


(Description of variables same as TI, see left column)

TI 84

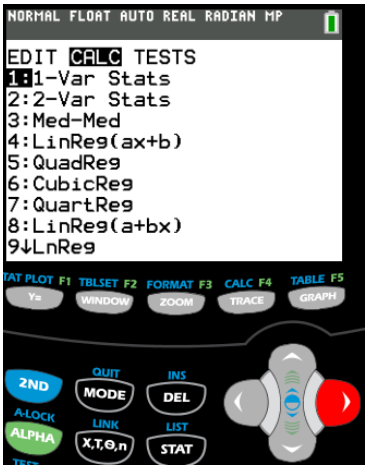


Press STAT (key in red)
Enter



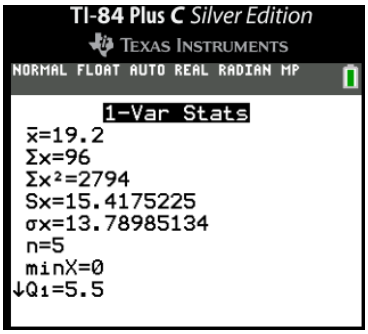
Enter values: 0, 11, 17, 28, 40 on list1

Press STAT again and using the navigation keys move over CALC:



and press Enter:

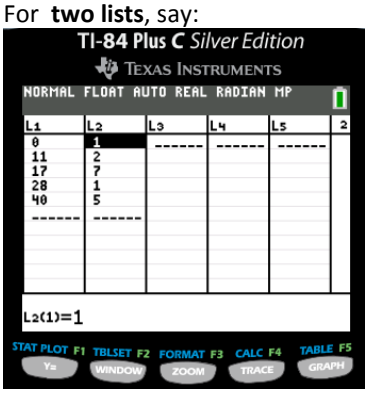
Since we have only one list, list 1, keep pressing enter or use the navigation keys, once on Calculate, press Enter.



Scroll down using navigation keys for Med, Q3, Max.

****

For **two lists**, say:



Input list2 for freqList by pressing 2nd, 2 (L2 in blue):