Descriptive Statistics For Grouped Data

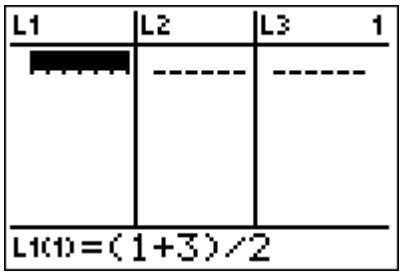
The TI-83/84 calculator will calculate an estimate for the mean and sample standard deviation from a frequency table or histogram by using midpoints to estimate each class.

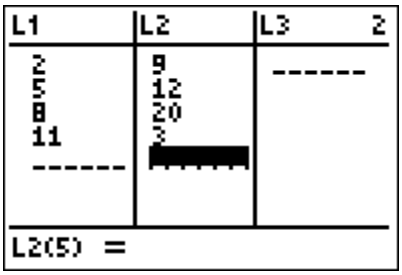
Example 1:
A random sample of 44 automobiles registered in Dallas, Texas show the ages of the cars to be:

Age (in years)	Frequency
1 - 3	9
4 - 6	12
7 - 9	20
10 - 12	3

Estimate the mean and standard deviation of the ages of the cars.

First press STAT and select **Edit** to put the midpoints in L_1 and the frequencies in L_2. For each midpoint enter (lower limit + upper limit)/2





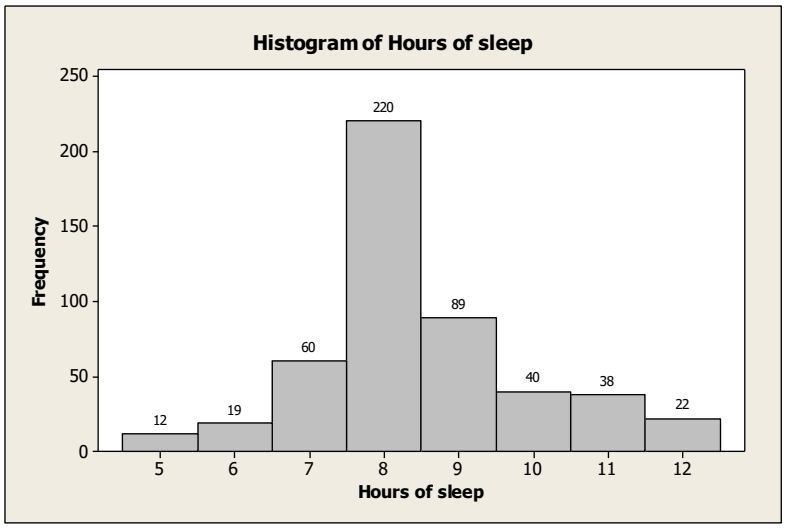
Press STAT and scroll over to **CALC**, and select **1:1-Var Stats**. Designate the data lists with the first list having the data and the second list having the frequencies. Do this by pressing 2nd 1 (for L_1), , 2nd 2 (for L_2). See screen on left for older calculators. For newer calculators with Stat Wizard turned on, the screen on the right comes up. The midpoint list is the "List" line, and frequency list goes on the second line; here enter L_2, then select Calculate.

Press ENTER and the descriptive statistics of the grouped data will appear.

```
1-Var Stats
 x̄=6.159090909
 Σx=271
 Σx²=1979
 Sx=2.684522233
 σx=2.653840971
↓n=44
```

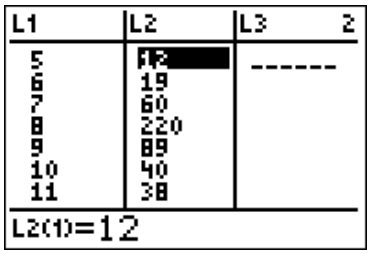
From the screen above, an estimate for the mean is 6.159 and the estimate for the sample standard deviation is 2.685 (when rounded to the thousandths place). Note that the sample size (n) matches the sum of the frequency column (L_2).

Example 2:
A random sample of 500 community college students produced the following histogram recording hours of sleep.

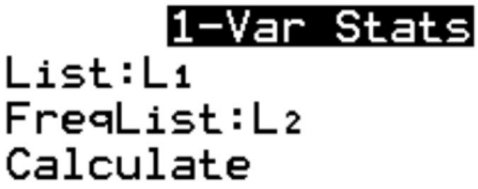


Estimate the mean and standard deviation of the hours of sleep.

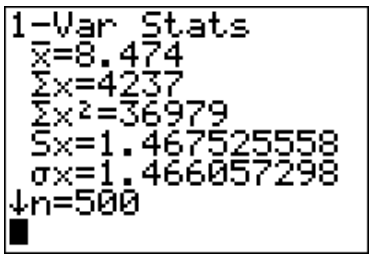
First put the midpoints in L_1 (see x-axis) and the frequencies (bar heights) in L_2.



Press STAT and scroll over to **CALC**, and select **1:1-Var Stats**. Designate the data lists with the first list having the data and the second list having the frequencies. Do this by pressing 2nd 1 (for L_1), , 2nd 2 (for L_2).



Press ENTER and the descriptive statistics of the grouped data will appear.



From the screen above, an estimate for the mean is 8.474 and the estimate for the sample standard deviation is 1.468 (when rounded to the thousandths place). Note that the sample size (n) matches the sum of the frequency column (L_2).

One thing to note is that if L_2 is a list of relative frequencies or probabilities, the sum of the list will add to 1, and the S_x line will be blank (since the sum is 1, n-1 will result in division by zero). This means that only the population standard deviation can be found. To find the sample standard deviation, you will need to use the raw counts.