

TI-83/84 How To Series

Topic: Draw and Read a Histogram

Histograms are a very useful tool when determining how a data set behaves. The data sets may be small (< 10 data points) or large (> 500 data points) and the TI-83/84 can handle it all.



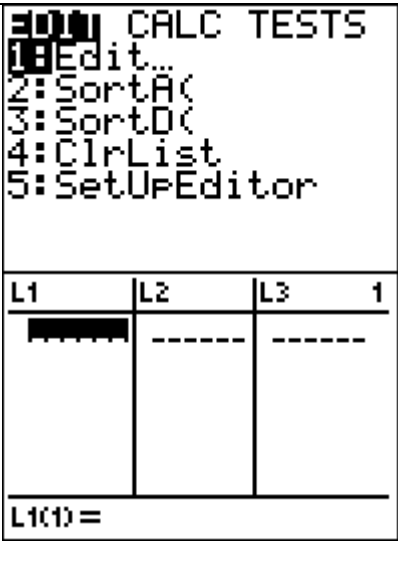
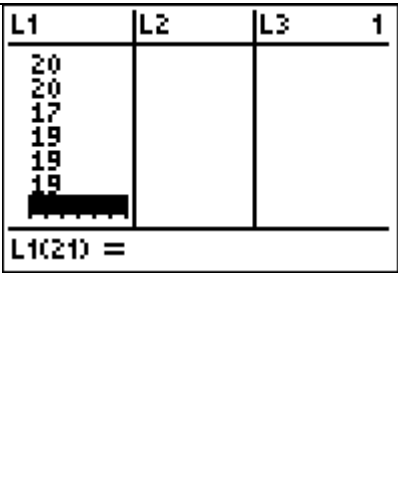
In this example we will learn how to draw and interpret a histogram.

Let's take the following set of data:

16, 17, 18, 18, 18, 18, 17, 18, 18, 18, 19, 17, 20, 21, 20, 20, 17, 19, 19, 19

Steps

1. Clear the memory of your calculator
2. Input the data into L1 of your calculator.

<p></p> <p></p> <p>Keystrokes get to your list screen</p>	 <table border="1"><thead><tr><th>L1</th><th>L2</th><th>L3</th><th>1</th></tr></thead><tbody><tr><td>-----</td><td>-----</td><td>-----</td><td></td></tr></tbody></table> <p>L1(1) =</p>	L1	L2	L3	1	-----	-----	-----																									
L1	L2	L3	1																														
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<p>Enter the data above into L1 of your calculator.</p> <p>BE CAREFUL. Many students make mistakes entering in data. Always double check the number of data points entered corresponds to the number of data points given.</p> <p>In our case, the number of data points given is 20 and the number entered is 20 as well. Look at the screen L1(21) indicates the calculator is waiting for the user to enter in data point 21, but since we do not have one we stop. Therefore, 20 data points have been entered.</p>	 <table border="1"><thead><tr><th>L1</th><th>L2</th><th>L3</th><th>1</th></tr></thead><tbody><tr><td>20</td><td></td><td></td><td></td></tr><tr><td>20</td><td></td><td></td><td></td></tr><tr><td>17</td><td></td><td></td><td></td></tr><tr><td>19</td><td></td><td></td><td></td></tr><tr><td>19</td><td></td><td></td><td></td></tr><tr><td>19</td><td></td><td></td><td></td></tr><tr><td>-----</td><td></td><td></td><td></td></tr></tbody></table> <p>L1(21) =</p>	L1	L2	L3	1	20				20				17				19				19				19				-----			
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If you miss a data point or you need to delete a data point refer to [Drawing a Scatter Plot](#).

3. Set your WINDOW to the appropriate settings. For help in performing this refer to [Viewing Graphs Using the Window Function](#). For our set of data complete the following steps.

<p>WINDOW</p> <p>Bring up the window screen. The screen to the left is the default screen. We need to change these values to match our data.</p>	<pre> WINDOW Xmin=-10 Xmax=10 Xscl=1 Ymin=-10 Ymax=10 Yscl=1 Xres=1 </pre>	
<p>We have chosen these for a variety of reasons:</p> <ol style="list-style-type: none"> Xmin and Xmax covers our data range. Ymin starts at zero (the number of entries is ALWAYS above 0) and the Ymax was chosen because the most of any one type of data (ie. 16, 17, 18, 19, 20) does not exceed 10. Choose your Xscl wisely. In this case we are dealing with a concentrated set of data (ie. the range is not very large). However, if the data were spread out more, our Xscl would change accordingly. You will see this in our next example. 	<pre> WINDOW Xmin=15 Xmax=25 Xscl=1 Ymin=0 Ymax=10 Yscl=1 Xres=1 </pre>	

4. Turn on your plot and select the histogram option.

<p>2nd Y=</p> <p>Bring up the plot screen.</p> <p>Notice how all plots are Off. We need to turn Plot 1 on.</p>	<pre> STAT PLOTS 1:Plot1...Off L1 L2 2:Plot2...Off L1 L2 3:Plot3...Off L1 L2 4↓PlotsOff </pre>	
<p>ENTER ENTER</p> <p>Turn on Plot 1.</p>	<pre> 1:Plot1 Plot2 Plot3 On Off Type: [] [] [] [] [] [] Xlist:L1 Ylist:L2 Mark: [] + . </pre>	

	<pre> P1:1 Plot2 Plot3 Off Off Type: [Histogram] [Line] [Bar] [Normal] [Normal] [Normal] Xlist:L1 Freq:1 </pre>	
<p>Select the histogram by using your arrow keys.</p> <p>Notice or Xlist indicates L1. This is good because our data is in fact stored in L1.(Step 2)</p>		

5. Graph the histogram.

<p></p> <p>Notice how our histogram covers the entire screen. This is because we set the WINDOW up correctly in Step 3.</p>		
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The shape of the histogram tells us many things and the student will have a good understanding of how the data is behaving. However, we still need have values to grasp the entire picture.

6. Finding values on the histogram.

<p> </p> <p>When the TRACE feature is activated you can scroll left and right to find out about individual bars of the histogram.</p> <p>In this case min = 16 and the max < 17 meaning the bar covers the area between 16 and 17. Remember we set our Xscl to 1 so it would make sense the bars only go up by one.</p> <p>On the right hand side n = 1. n represents the size.</p> <p>Therefore we can conclude that there is one number 16.</p>	<pre> P1:L1 min=16 max<17 n=1 </pre>	
<p> </p> <p>Scrolling over more lets us see there are 17 data points at number 18.</p>	<pre> P1:L1 min=18 max<19 n=7 </pre>	

Example 2: Using data more spread out.

Steps

1. Take the following 20 points of data and enter it into L2 of your calculator. Do not delete the data from the previous example.



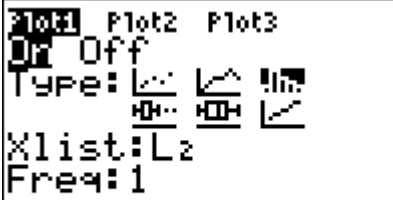
5, 6, 8, 8, 9, 11, 14, 15, 15, 18, 20, 21, 22, 32, 34, 35, 36, 37, 40, 42

Now we have two sets of data, but for this example we are only interested in the data set entered in L2	L1	L2	L3	2
	20 20 17 19 19 19 -----	34 36 36 40 42 -----		
L2(21) =				


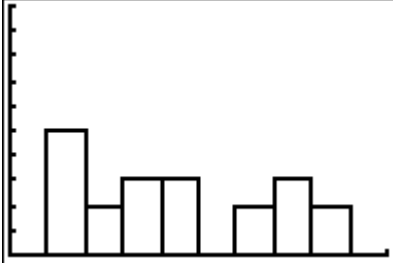
2. Set the WINDOW of the calculator

We will set the WINDOW according to the data. The Xscl of 5 represents how wide the bars of the histogram will be.	WINDOW	
	Xmin=0 Xmax=50 Xscl=5 Ymin=0 Ymax=10 Yscl=1 Xres=1	

3. Change the PLOT to graph L2

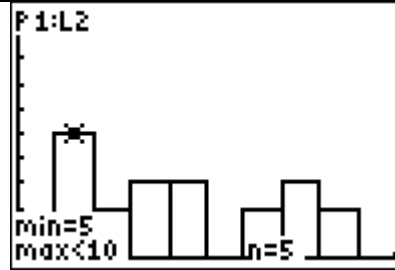
 		
The plot type is still a histogram but the Xlist has been changed from L1 to L2		

4. Graph the histogram and use the TRACE feature to number of data points for each bar.

		
The histogram is displayed.		



Using the arrow keys, we can see how many data points are between 5 and 9 (we say 9 because the $\text{max} < 10$). There are $n = 5$ data points.



Notice that the width of the histograms is 5 (5, 6, 7, 8, 9) as was set by the Xscl.

Use the arrow keys to find out the rest of the histogram data.