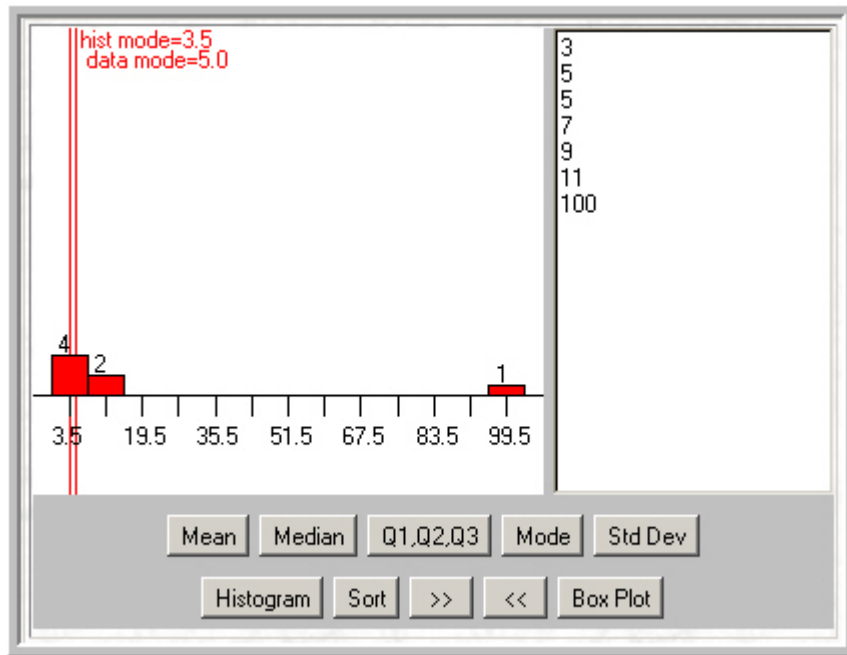


SOLUTIONS - CHAPTER 8 QUIZ

8.1 The lowest value in the set is 3, so this is the minimum. 100 is the highest value in the set and, therefore, is the maximum. The range is $100 - 3 + 1 = 98$.

8.2 The value 5 occurs the most often (twice) in set M and is therefore the mode.

Applet Method Enter the data, press “Mode” and move the blue triangle towards the mode. Look at the data mode.

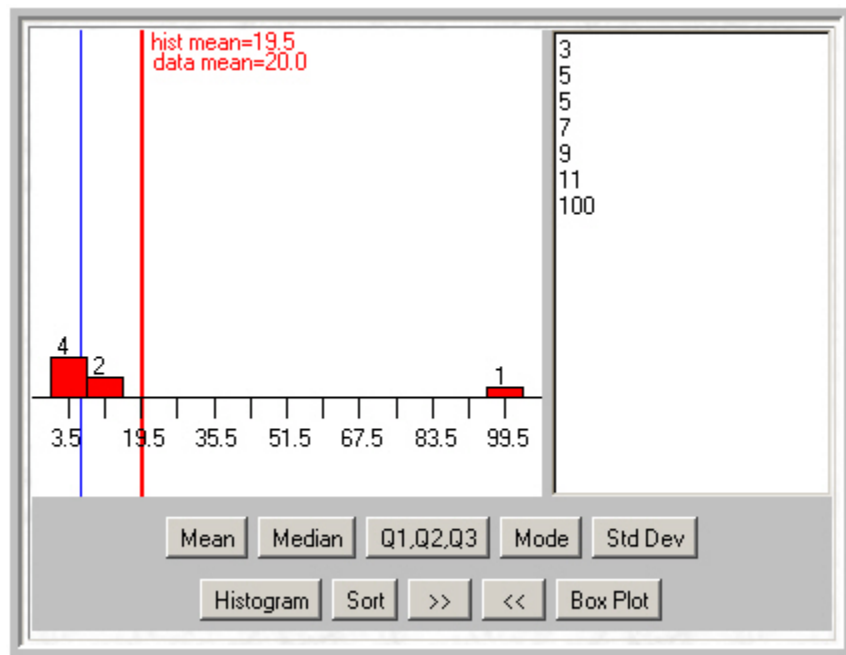


Therefore, the mode is 5. Remember to check the data yourself to see if there is more than one mode. In this case there is only the one mode, 5.

8.3 The mean is calculated by the following:

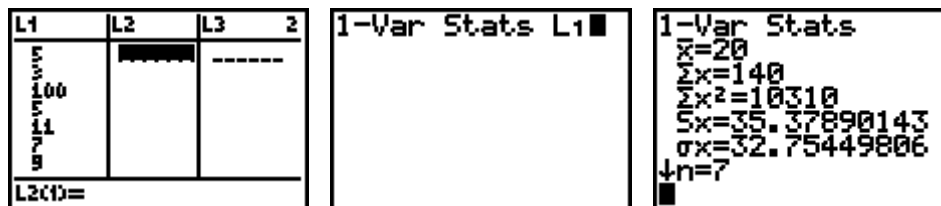
$$\begin{aligned}\mu &= \frac{\text{Sum of the data points}}{\text{Number of data points}} \\ &= \frac{5 + 3 + 100 + 5 + 11 + 7 + 9}{7} \\ &= \frac{140}{7} = 20\end{aligned}$$

Applet Method Enter the data, press “Mean” and move the blue triangle until the data is balanced. Look at the data mean.



Therefore, the mean is 20.

Calculator Method (TI-83) Enter the data under [STAT] → EDIT. At your home screen, go to [STAT] → CALC ↓ 1:1-VAR STATS and then add on the list name L1 and press [ENTER].



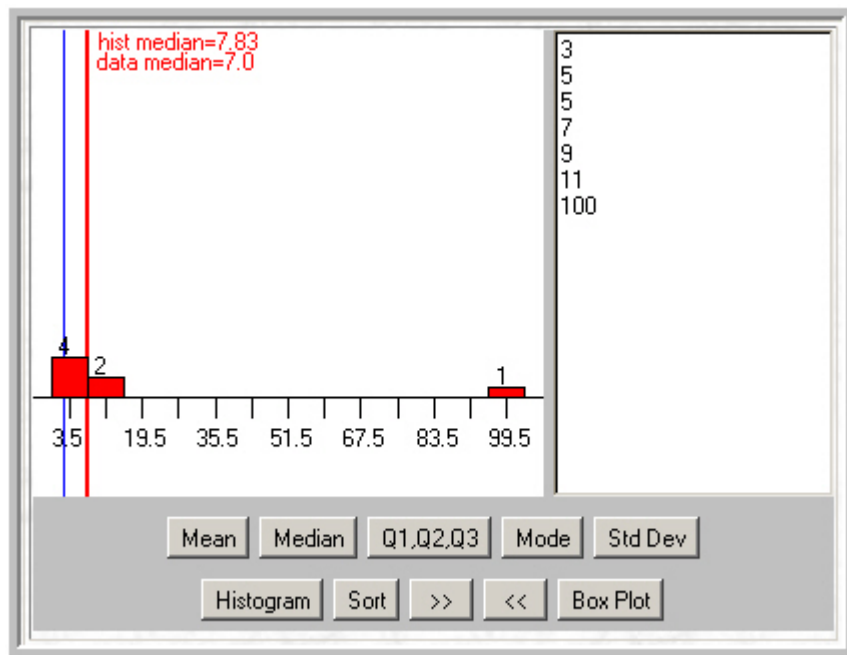
Therefore, the mean = $\bar{x} = 20$.

8.4 Start by putting the data in order from lowest to highest:

3,5,5,7,9,11,100

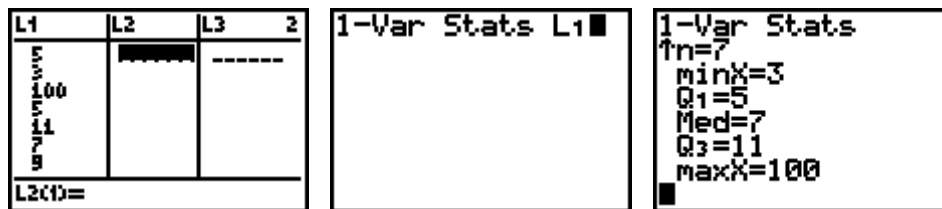
With 7 values, the midpoint occurs at the 4th value (three values lie above and below this point). Therefore, the median is 7.

Applet Method Enter the data, press “Median” and move the cursor to 50%. Look at the data median.



Therefore, the median = 7.

Calculator Method (TI-83) Follow the calculator instructions given in the solution to Question 8.3. At the result, cursor down until you see **Med**.



Therefore, the median = Med = 7.

8.5 The mean is the least representative since it is higher than 6 of the 7 points in the set.

8.6 Subtracting the midpoints of the intervals we find that the intervals are 4 units wide.

8.7 In Histogram *P*, the mode is 4, since it occurs the most (14 times).

In Histogram *Q*, the mode is both 6 and 8. Since they occur equally often and more than the remaining values, 2, 4, and 10.

8.8 Histogram *P* has a larger variance since the data is spread further apart (a lot of the data is near the minimum and a lot of the data is near the maximum), while Histogram *Q* has the majority of the data grouped together, with few outliers.

Calculator Method (TI-83) For each set of data, enter your *X* values into L1 and the frequencies into L2 under the [STAT] → EDIT option. At your home screen, go to [STAT]

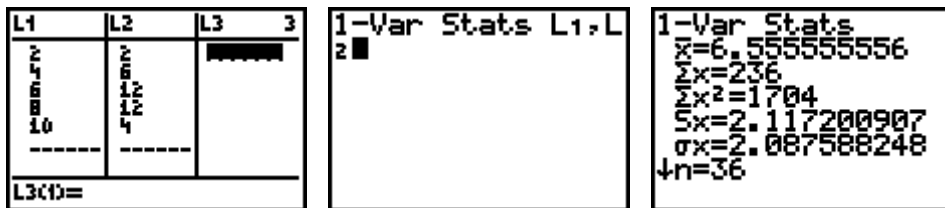
→ CALC ↓ 1:1-VAR STATS and add on the list names L1 and L2 (separated by commas) and press [ENTER].

For Histogram *P*:



and the variance = $(\sigma x)^2 = (2.8721)^2 = 8.2491$.

For Histogram *Q*:



and the variance = $(\sigma x)^2 = (2.0876)^2 = 4.3581$.

Therefore, Histogram *P* has the larger variance.

8.9 In each bag you are counting the number of blue worms and recording the result. Thus X = the number of blue worms and the frequencies will be the number of bags with the particular value of X . The most frequently occurring value of X is 2 and is therefore the mode.

8.10 The mean is calculated by summing the products of the value of X and its relative frequency. There are a total of 39 bags and therefore,

$$\begin{aligned} \mu &= x_1 p_1 + x_2 p_2 + x_3 p_3 + x_4 p_4 + x_5 p_5 + x_6 p_6 + x_7 p_7 \\ &= 0\left(\frac{2}{39}\right) + 1\left(\frac{7}{39}\right) + 2\left(\frac{12}{39}\right) + 3\left(\frac{7}{39}\right) + 4\left(\frac{10}{39}\right) + 5\left(\frac{9}{39}\right) + 6\left(\frac{1}{39}\right) \\ &= \frac{98}{39} \approx 2.5128 \end{aligned}$$

Calculator Method (TI-83) Follow the calculator instructions given in the solution to Question 8.8.

L1	L2	L3	3
0	2		
1	2		
1	0		
1	0		
L3()=			

1-Var Stats L1,L2

1-Var Stats
 $\bar{x} = 2.512820513$
 $\Sigma x = 98$
 $\Sigma x^2 = 314$
 $Sx = 1.335187644$
 $\sigma x = 1.317958695$
 $n = 39$

Therefore, the mean = $\bar{x} = 2.5128$.