Statistics Lab 5 Name: Key

The sample represents final exam scores from a geography class.

78 72 83 79 85 64 69 87 72 63 74

77 52 38 91 66 97 90 74 63 94 68 42

Use the sample given above to find the value of each statistic below.

1. (2 points) mean — 1. 73.0
2. (2 points) median — 2. 74
3. (2 points) mode — 3. 63, 72
4. (2 points) standard deviation — 4. 15.3
5. (2 points) variance — 5. 234.0
6. (2 points) range $= \max - \min = 97 - 38$ — 6. 59
7. (2 points) minimum — 7. 38
8. (2 points) quartile 1 — 8. 64
9. (2 points) quartile 2 — 9. 74
10. (2 points) quartile 3 — 10. 85
11. (2 points) maximum — 11. 97

The data below is a sample of retirement ages of 12 randomly selected doctors in San Diego. (Section 2.1 Exercise 39)

70 54 55 71 57 58 63 65 60 66 57 62

Use the sample given above to find the value of each statistic below. Include the correct units in your answers!.

12. (2 points) mean — 12. 61.5

13. (2 points) median — 13. 61

14. (2 points) mode — 14. 57

15. (2 points) standard deviation — 15. 5.6

16. (2 points) variance — 16. 32.0

17. (2 points) range = max - min = 71 - 54 — 17. 17

18. (2 points) minimum — 18. 54

19. (2 points) quartile 1 — 19. 57

20. (2 points) quartile 2 — 20. 61

21. (2 points) quartile 3 — 21. 65.5

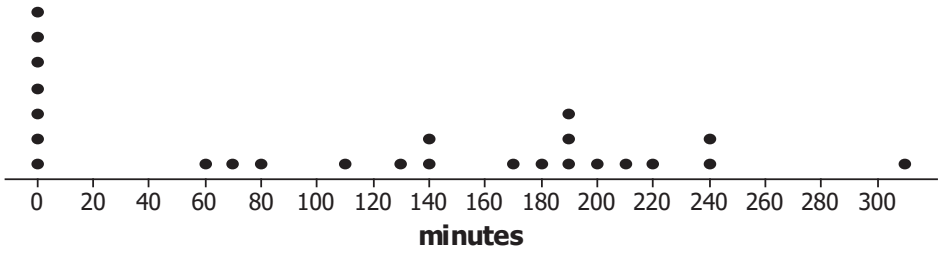
22. (2 points) maximum — 22. 71

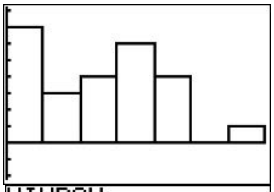
TABLE 3.1 Choosing Appropriate Measures for Describing Center and Spread

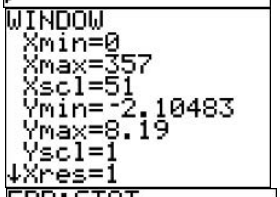
If the Shape of the Data Distribution Is...	Describe Center and Spread Using...
Approximately symmetric	Mean and standard deviation
Skewed or has outliers	Median and interquartile range

Figure 1: Table 3.1, pg 112

23: The median and the interquartile range. The average may not be the best measure of a typical value for this data set because examination of the dotplot (reproduced below) indicates that the distribution is skewed right and may contain an outlier.

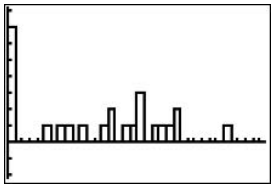




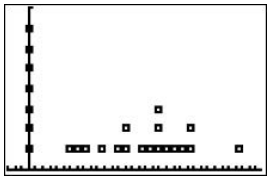


The pictures to the left show the histogram graph and window settings after you press 'zoom 9' (for zoomstat) . Because the data set is not a large data set, it is best to use the dot plot to visualize the distribution, and not a histogram. Or you may try to approximate the dot plot gram with a histogram.

The way to do this with this data set is to change your histogram bar widths to 1, by pressing [window] then changing 'Xscl' to 1. Afterwards, press [graph]. However, doing that will give you an error message screen like the one in the picture to the left. So we make 'Xscl' equal to 5 (to widen our bar width to 5) then press [graph] and we get the same error message.

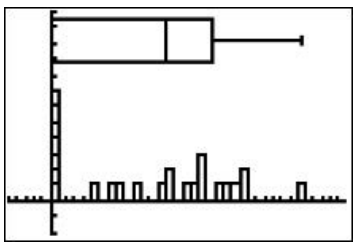


I was able to approximate the dotplot graph with the histogram graph (left figure) by changing 'Xsc' to 10, widening our histogram bars to 10).



My dot plot looks like this (left figure) after I press [graph] [zoom][9]

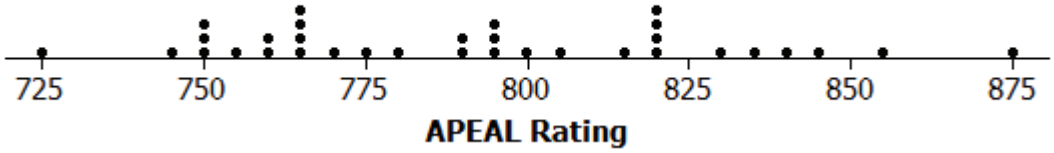
In any case, the result is the same. The graph is skewed right with a possible outlier on the upper end.



However, there are no outliers though because the modified box plot indicates it is not.

Also notice there is no left whisker because the data entry 0 is equal to both the minimum and quartile 1.

24:



The distribution of APEAL ratings is roughly symmetric, so using the mean and standard deviation to describe center and spread, respectively, is appropriate.

1. List the data in ascending fashion.

1, 5, 8, 10, 14, 14, 15, 15, 16, 16, 17, 18, 18, 19, 20, 21, 25, 28, 33, 37

2. Find the minimum — 2. 1

3. Find Q_1 — 3. 14

4. Find Q_2 — 4. 16.5

5. Find Q_3 — 5. 20.5

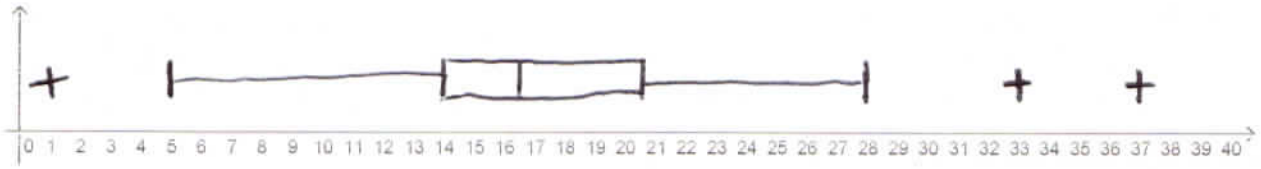
6. Find the maximum — 6. 37

7. Find the lower fence. $LF = Q1 - 1.5(Q3 - Q1)$ $= 14 - 1.5(6.5) = 4.25$ — 7. 4.25

8. Find the upper fence $UF = Q3 + 1.5(Q3 - Q1)$ $= 20.5 + 1.5(6.5) = 30.25$ — 8. 30.25

9. What numbers are outliers? — 9. 1, 33, 37

10. Sketch the graph of a modified boxplot. Label the x axis.



number of paid vacation days

11. About 75% of the employees in the sample took at least how many days off?

11. 14 days

12. What percentage of employees took more than 16 and a half days off?

12. 50%

13. You randomly select one employee from the sample. What is the likelihood that the person took less than 20.5 days off?

13. 75%