Mini-Lesson #2 Determining Variability from Box plots and Finding Measures of Variability

(Data Unit)

**Part I: Review of Box Plots**

Box Plot 5-Number Summary

Lower

Extreme

Extreme

Extreme

Lower

Extreme

Quartile

Extreme

Median

Extreme

Upper

Extreme

Quartile

Extreme

Upper

Extreme

Extreme

Extreme

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

How to find parts of the box plot:

* Lower Extreme \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Lower Quartile\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Median\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Upper Quartile \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Upper Extreme\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Interquartile Range (IQR)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reading a box plot:

Assume the data in the box plot above represents the number of minutes it takes students to walk to school.

1. What is the range of minutes that it takes students to walk to school? \_\_\_\_\_\_

2. What percent of the students walk less than or equal to 10 minutes? \_\_\_\_\_\_

3. What percent of the data lies within the inter-quartile range? \_\_\_\_\_\_

4. What is the interquartile range of the minutes it takes students to walk to school? \_\_\_\_\_\_

5. If this data represents 120 students, then how many students walk between 10 and 20 minutes? \_\_\_\_\_\_

**Part II: Review of measures of Variability**

|  |  |  |
| --- | --- | --- |
| Measures of Center | Measures of Variability | Measures of Shape Distributions |

**Part III: Comparing Data**

Example 1: Tim is on the wait staff at the Casual Café, and Dan is on the wait staff at Bountiful Bistro. The box plots below display the amounts they earned in tips on weekends during the past six months.

INSERT BOX PLOT FOR Tim and Dan here

A. What is the range and interquartile range of the data displayed in each box plot?

B. Use the ranges and interquartile ranges of Tim’s and Dan’s tips. Compare how their tips vary.

C. Are either of the box plots symmetric?

D. Compare how the amounts of Tim’s and Dan’s tips are distributed.

E. Which, if any, of the box plots shows clusters of data?

F. Use the evidence of clusters or no clusters to compare Tim’s and Dan’s tips.

G. Overall, who do you think earns more tip money? Explain.

Example 2: You can use measures of variability, such as interquartile range and mean absolute deviation, to make sense of data sets, both numerically and visually.

A. The box plot compares the dinner ticket amounts for the two restaurants.

INSERT BOX PLOTS HERE

1. Compare the distributions of the data shown in the box plot. What conclusions can you draw about the cost of dinner?

2. a. Find the median value and the interquartile range for each restaurant.

 b. What is the difference in the medians?

3. Do the results you found support the conclusions you made about the data? Explain why or why not.

B. The dot plots show the lengths of time, to the nearest 10 minutes, some diners spent at dinner at each restaurant.

1. What comparison can you draw from looking at the plots about the time diners spend having dinner at the restaurants?

2. What is the difference in the median value for each set of data?

3. For which set of data would you expect a greater interquartile range? Explain your answer.