Week One STAT 145 Homework

Try It 2.14
https://openstax.org/books/introductory-statistics/pages/2-3-measures-of-the-location-of-the-data

**TRY IT 2.14**

Find the interquartile range for the following two data sets and compare them.

Test Scores for Class *A*
69; 96; 81; 79; 65; 76; 83; 99; 89; 67; 90; 77; 85; 98; 66; 91; 77; 69; 80; 94
Test Scores for Class *B*
90; 72; 80; 92; 90; 97; 92; 75; 79; 68; 70; 80; 99; 95; 78; 73; 71; 68; 95; 100

Using Minitab 19:

## Statistics

| Variable | N | N* | Mean | StDev | Minimum | Median | Q3 | Maximum | IQR |
|---|---|---|---|---|---|---|---|---|---|
| Class A Scores | 20 | 0 | 81.55 | 10.99 | 65.00 | 80.50 | 90.75 | 99.00 | 20.00 |
| Class B Scores | 20 | 0 | 83.20 | 11.23 | 68.00 | 80.00 | 94.25 | 100.00 | 22.00 |

ANSWER:
IQR Class A: 20
IQR Class B: 22
The interquartile range for Class A is smaller than Class B.

https://openstax.org/books/introductory-statistics/pages/2-practice
Practice Problems 52, 53, 54, 55

52. When the data are skewed left, what is the typical relationship between the mean and median?

ANSWER: In a skewed left distribution, the mean is smaller than the median value.

**53**.

When the data are symmetrical, what is the typical relationship between the mean and median?

ANSWER: In a symmetric distribution, the mean is approximately equal to the median value.

54. What word describes a distribution that has two modes?

ANSWER: The term is bimodal.

**55**.

Describe the shape of this distribution.

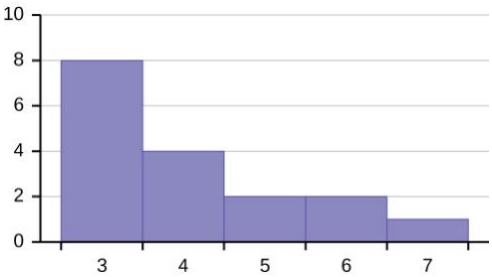


**Figure 2.32**

ANSWER: The distribution is considered skewed right or skewed positively since the mode (highest peak) is on the left and there are fewer data points at the higher end --long tail is on the right.

https://openstax.org/books/introductory-statistics/pages/2-homework

88. Given the following box plots, answer the questions.

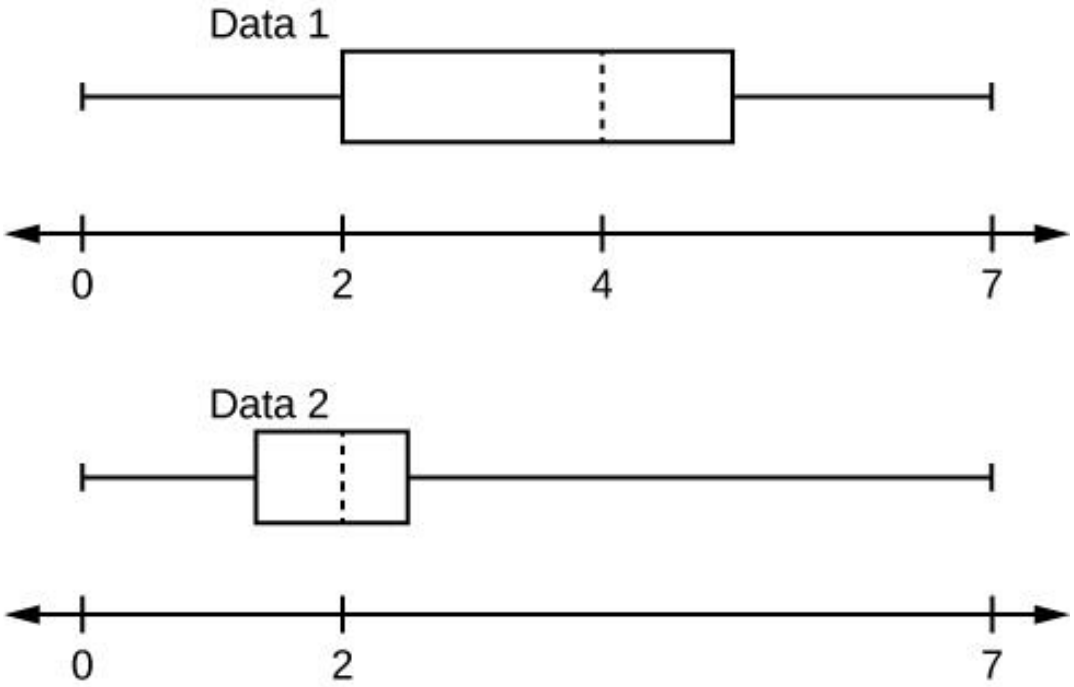



**Figure 2.45**

a. In complete sentences, explain why each statement is false.
   i. **Data 1** has more data values above two than **Data 2** has above two.

ANSWER: Data 1 has the IQR rectangle and a whisker above 2; that represents 75% of the data that is above the value '2'. Data 2 has 50% of the data points above the value '2'. However, since a box plot does not tell us/show us HOW MANY data points are in each data set, there is no way of knowing the number of data values.

   ii. The data sets cannot have the same mode.

ANSWER: We cannot see mode on a box plot.

   iii. For **Data 1**, there are more data values below four than there are above four.

ANSWER: The value '4' is the median. Exactly 50% of the data is below the value '4' and 50% is above.

b. For which group, Data 1 or Data 2, is the value of "7" more likely to be an outlier? Explain why in complete sentences.

ANSWER: The value ‘7’ is more likely an outlier in Data Set 2 since it is further from the median.
NOTE: in a modified box plot, we would see outliers indicated by an asterisk.

115 (Parts a - h)
**115**.

Following are the published weights (in pounds) of all of the team members of the San Francisco 49ers from a previous year.

177; 205; 210; 210; 232; 205; 185; 185; 178; 210; 206; 212; 184; 174; 185; 242; 188; 212; 215; 247; 241; 223; 220; 260; 245; 259; 278; 270; 280; 295; 275; 285; 290; 272; 273; 280; 285; 286; 200; 215; 185; 230; 250; 241; 190; 260; 250; 302; 265; 290; 276; 228; 265

a. Organize the data from smallest to largest value.

174; 177; 178; 184; 185; 185; 185; 185; 188; 190; 200; 205; 205; 206; 210; 210; 210; 212; 212; 215; 215; 220; 223; 228; 230; 232; 241; 241; 242; 245; 247; 250; 250; 259; 260; 260; 265; 265; 270; 272; 273; 275; 276; 278; 280; 280; 285; 285; 286; 290; 290; 295; 302

## Statistics

| Variable | N | N* | Mean | StDev | Min | Q1 | Median | Q3 | Max | IQR | Mode |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Weights | 53 | 0 | 236.34 | 37.86 | 174.00 | 205.50 | 241.00 | 272.50 | 302.00 | 67.00 | 185 |

| Variable | N for Mode |
|---|---|
| Weights | 4 |

b. Find the median.

Median: 241

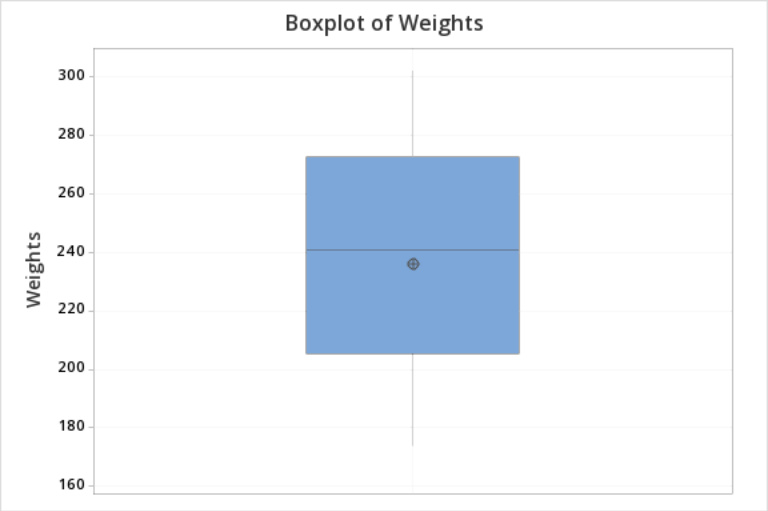
c. Find the first quartile.

Q1: 205.5

d. Find the third quartile.

Q3: 272.50

e. Construct a box plot of the data.




f. The middle 50% of the weights are from _____ to _____.

From 205.5 to 272.50

g. If our population were all professional football players, would the above data be a sample of weights or the population of weights? Why?

If the population were all professional football players, then the weights of the SF 49er players would be a sample of weights.

h. If our population included every team member who ever played for the San Francisco 49ers, would the above data be a sample of weights or the population of weights? Why?

**NOTE** I do not agree with the answer key
If the population were all team members of the SF 49er players, then this data would be a sample of weights since it is only from the previous year.