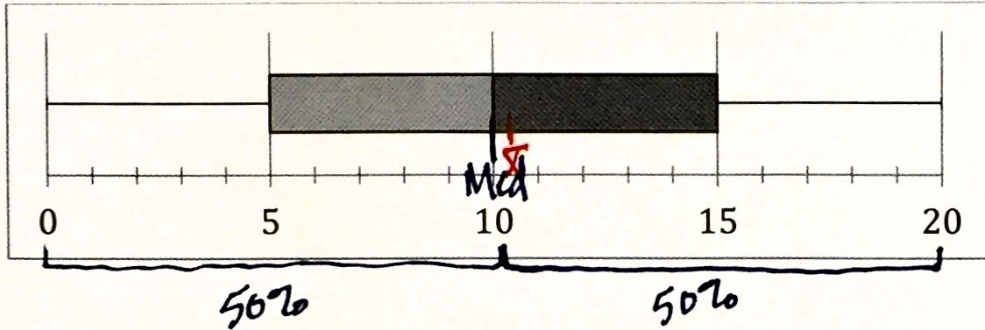


Distribution of Box & Whisker Plots

Normal Distribution

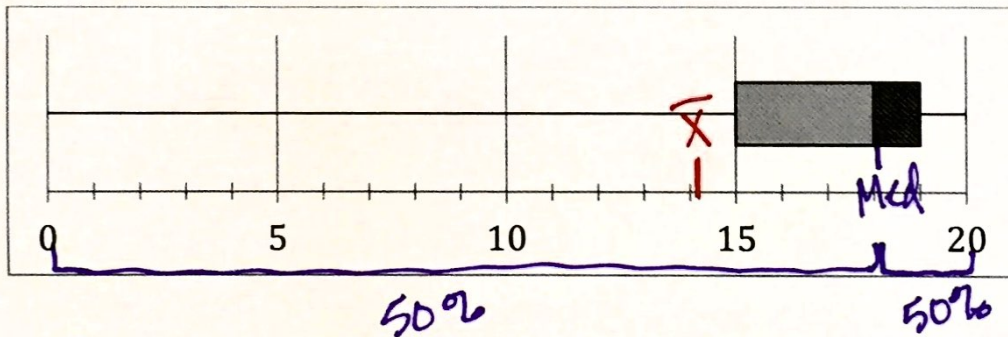
Mean = 10.25



Normal:
both halves of
the data are
equally spread

Skew Left

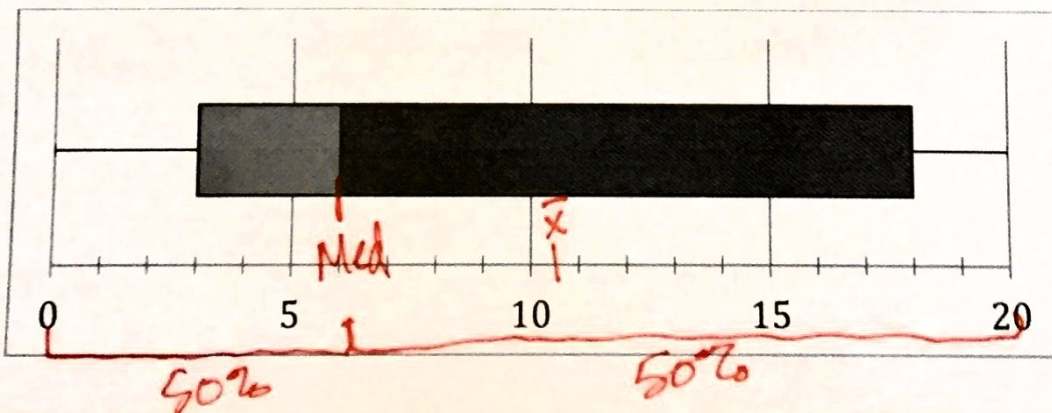
Mean = 14.3



Skew:
is determined
by the longest
side

Skew Right

Mean = 10.3



Notes 7-3

Sec 1 H

Box & Whisker Plots - Outliers

Unit 7

You gather data from people in your neighborhood about how much they paid for their most recent vehicle. The prices of the vehicles (in thousands of dollars) were 16, 6, 11, 9, 20, 3, 17, 5

Create a five number summary from the data set by hand

Min: 3 Q_1 : 5.5 Med: 10 Q_3 : 16.5 Max: 20

3, 5 | 6, 9 | 11, 16 | 17, 20
5.5 10 16.5

You had a new neighbor move in and they paid 50 thousand dollars for their car. What is the new five number summary?

Min: 3 Q_1 : 5.5 Med: 11 Q_3 : 18.5 Max: 50

3, 5 | 6, 9, 11 | 16, 17 | 20, 50
5.5 18.5

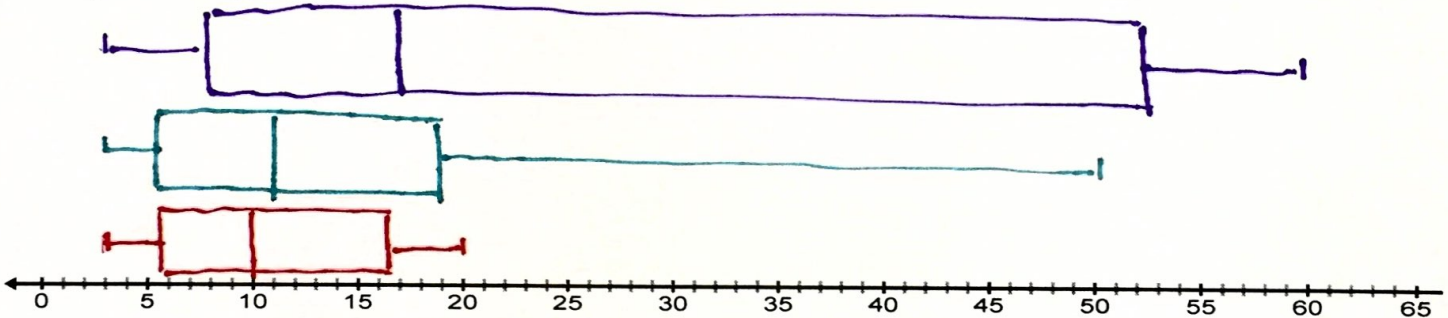
OUTLIER

A few more people moved into your neighborhood and you asked how much they paid for their vehicles. They told you 51, 60, 55, and 54 thousand dollars. Now what is the five number summary?

Min: 3 Q_1 : 7.5 Med: 17 Q_3 : 52.5 Max: 60

3, 5, 6 | 9, 11, 16, 17 | 20, 50, 51 | 54, 55, 60
7.5 52.5

Plot all three five number summaries as Box and Whisker Plots above the same number line. What do you notice? Why is this happening?



Car Prices (\$1000)

Outliers- A data point that is abnormally far away from most of the data.

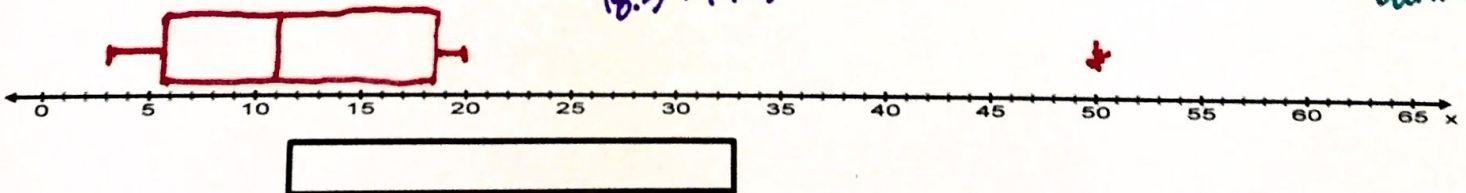
- ① Find the IQR $Q_3 - Q_1$
- ② $1.5(IQR)$
- ③ $Q_1 - 1.5(IQR)$ = Lower Limit for Outliers
- ④ $Q_3 + 1.5(IQR)$ = Upper Limit for Outliers

$Q_1 - 1.5IQR$ and $Q_3 + 1.5IQR$ become the limits that determine outliers

Calculate if there are any outliers in your previous five number summaries, and re-draw the Box and Whisker plots using a dot to indicate that it is an outlier.

$Q_3 - Q_1 = 18.5 - 5.5 = 13$
 $1.5(IQR) = 1.5(13) = 19.5$

$Q_1 - 1.5(IQR)$ LLO
 $5.5 - 19.5 = -14$
 $Q_3 + 1.5(IQR)$
 $18.5 + 19.5 = 38$ ULO



Notes 7-3

Sec 1 H

Box & Whisker Plots - Outliers

Unit 7

Graphing Calculators

Ms. Johnson gives a math test to her students. The student's test scores are listed below.

85, 74, 86, 78, 100, 77, 81, 87, 84, 74, 85, 74, 80, 78, 87, 85, 77, 75, 85, 84

In your graphing calculator, enter the scores into L1 and create a five number summary for the data set. Plot the Box and Whisker **including outliers** on your calculator. {WINDOW-> Xmin = 0 Xmax= 105 Xscl= 10}

Min: 74
Q1: 77
Med: 82.5
Q3: 85
Max: 100

A student was absent the day of the test, but took it and scored a 33. Enter all the scores, including the new one into L2. **(Do Not Change L1)** What are the new values for the five number summary? Plot the new Box and Whisker **including outliers** on your calculator. What has changed from the previous Box and Whisker plot?

More students that were absent took the test, and scored 40, 85, and 71. Enter all previous scores and these three into L3. **(Do Not Change L1 or L2)** How does the five number summary change if these three data points are now added to the data set? Plot the new Box and Whisker **including outliers** on your calculator. What do you notice has happened?