Sunday, October 14, 2018
5:14 PM

KEY

Boxplots Day 3 (Using the TI83)

Do Now: *** With your partner!**
Use the stemplot below to do #1 – 3. Then, turn the page and check your answers using the steps on the calculator.

Number of people in each state who have more than 5 children

4	9
5	
6	
7	
8	8
9	
10	0 0 2 9
11	0 1 1 3 4 4 4 6 9
12	0 0 3 4 4 5 5 5 6 6 6 6
13	0 1 3 3 4 4 5 6 7 7 9 9 9
14	2 3 4 5 5
15	2 3 7 9
16	
17	
18	6

Key: 13| 1 means 131 people

< Q1 + 1.5(IQR)
> Q3 + 1.5(IQR)

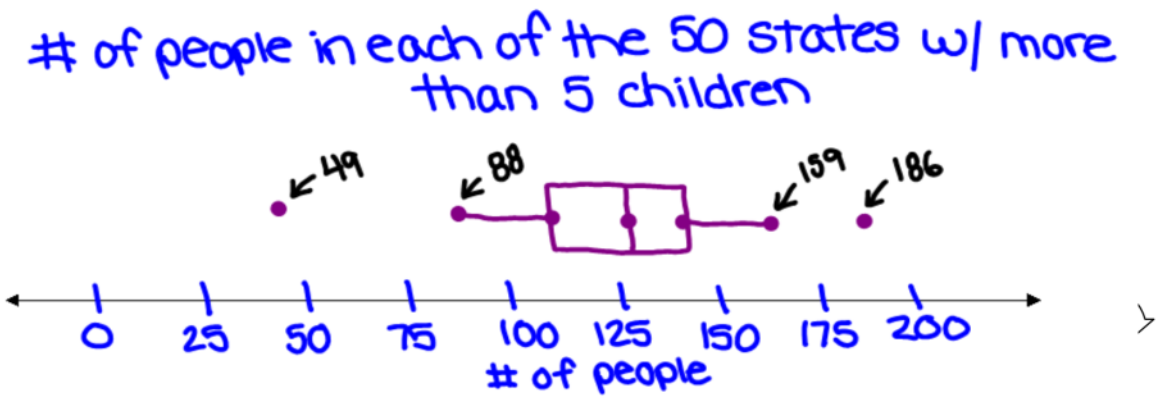
1.) Find the five number summary and determine if there are any outliers using formulas.

5 #summary:
min = 49
Q1 = 114
med = 126
Q3 = 139
max = 186

Outliers:
IQR = Q3 − Q1
= 139 − 114
= 25

< Q1 − 1.5(25) = 76.5
> Q3 + 1.5(25) = 176.5
Outliers are 49 and 186

2.) Create a box plot of the data. ***Remember**: Box plots are always modified!

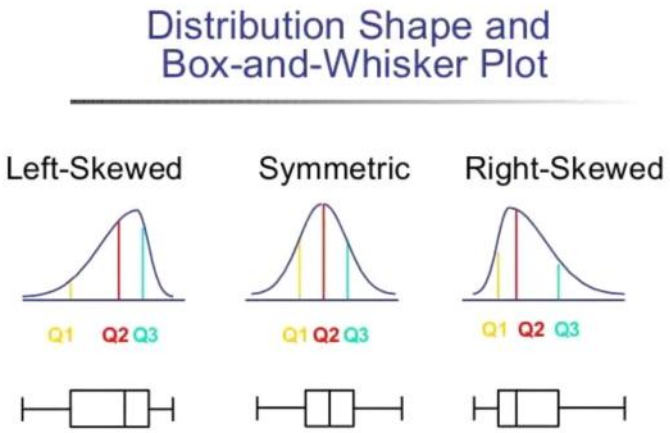


Notes for making a box plot on the TI83

Use the data from the DO NOW and follow the steps below.

- Put data into L_1.
- Go to StatPlot and turn on plot 1. For the type, choose a modified box plot (Use the right arrow to go to the 4th option. It's the one after the histogram.)
- Hit Zoom 9 to see your box plot.
- Use the TRACE feature and arrow keys to determine the 5 number summary and outliers.
- **It should match up with the answers we got for the Do Now.**

Notes on finding shape of a box plot

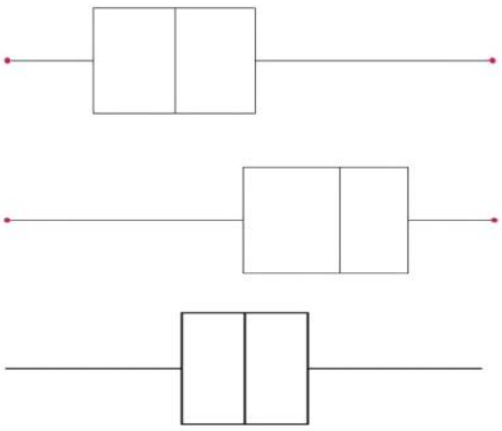


For the shape of a boxplot, we can only determine if it is symmetric, skewed left, or skewed right. We cannot see if data is unimodal or bimodal.

To determine the skewness, we look at the length from the median to the minimum and the median to the maximum. If one side is longer, then it is skewed in that direction.

Practice:

Label each boxplot below with **symmetric**, **skewed left**, or **skewed right**.



skewed right

skewed left

symmetric

STOP

Partner Practice:

Southern	*Poverty (%)*	*Northern*	*Poverty (%)*
Alabama	12.5	Connecticut	6.2
Delaware	6.5	Illinois	7.8
Florida	9.0	Indiana	6.7
Georgia	9.9	Maine	7.8
Kentucky	12.7	Massachusetts	6.7
Maryland	6.1	Michigan	7.4
Mississippi	16.0	New Hampshire	4.3
N. Carolina	9.0	New Jersey	6.3
S. Carolina	10.7	New York	11.5
Tennessee	10.3	Ohio	7.8
Virginia	7.0	Pennsylvania	7.8
West Virginia	13.9	Rhode Island	8.9
		Vermont	6.3
		Wisconsin	5.6

The poverty rates for states east of the Mississippi have been divided into northern and southern states, according to the geographic divisions used by the Census Bureau.

a.) Find the five number summary and determine outliers for the **Southern** states? (Use L_1)
Always show work using the formulas for determining the outliers.

min = 6.1
Q1 = 8
med = 10.1
Q3 = 12.6
max = 16

IQR = Q3 − Q1
= 12.6 − 8
= 4.6
< Q1 − 1.5(IQR) = 1.1
> Q3 + 1.5(IQR) = 19.5

No outliers

b.) Find the five number summary and determine outliers for the **Northern** states? (Use L_2)
Always show work using the formulas for determining the outliers.

min = 4.3
Q1 = 6.3
med = 7.05
Q3 = 7.8
max = 11.5

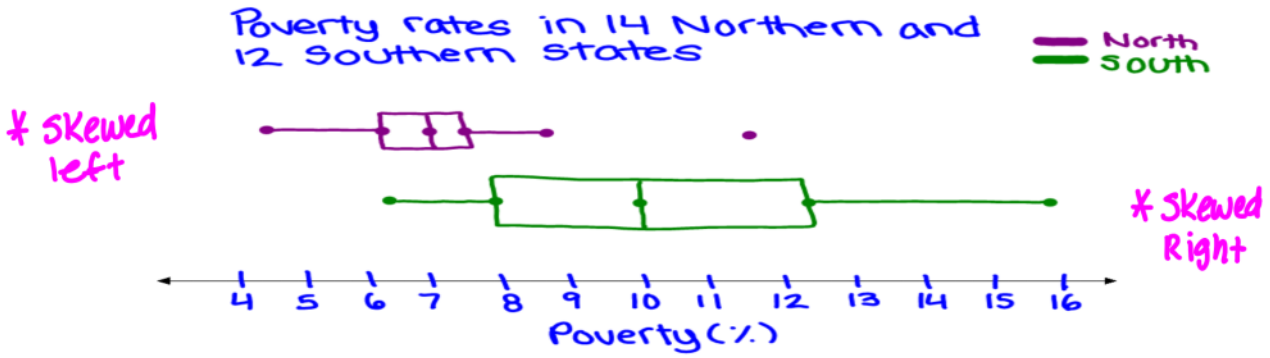
IQR = Q3 − Q1
= 7.8 − 6.3
= 1.5
< Q1 − 1.5(IQR) = 4.05
> Q3 + 1.5(IQR) = 10.05

Outliers:
11.5

c.) Create **side by side** box plots for the data.

To do this, make one number line with a scale that will fit both sets of data. Plot both modified boxplots above the number line using the same scale. This allows us to easily compare the two. Label one with "Northern" and one with "Southern".

To create side by side boxplots on the calculator, you can go to the statplot menu and make 1 the graph of L1 and make 2 the graph of L2. Make sure both 1 and 2 are turned on so you can see them together.



d.) Looking at the side by side boxplots, name 2 differences between the Southern and Northern data.

Answers will vary

1. The northern states data is skewed to the left while the southern states data is skewed to the right.
2. The southern states have a larger spread (IQR = 4.6) than the northern states (IQR = 1.5)

Assignment #11 (1.3 Day 2 HW):

- **Do this in your HW notebook! Do not staple any papers into your notebook!**

1. **DO SUV'S WASTE GAS?** Find the 5 number summary and show work for outliers for the highway fuel consumption (mpg) of both the 32 midsize cars and 26 SUV's (separately). Make a side by side boxplot of the data. Analyze the data and state 3 observations contrasting the data of the 2 boxplots.

26 SUV's

22	17	16	17	19	20	20	19	19
27	20	26	21	17	20	18	18	18
20	20	18	19	19	20	18	19	

32 Midsize Cars

24	24	21	29	24	28	30	28
28	29	28	28	23	24	21	26
24	25	25	28	28	30	24	25
28	28	28	26	32	30	29	27