Section 3.5

The Five Number Summary and Boxplots

Exploratory data analysis = the process of using statistical tools (such as graphs, measures of center, and measures of variation) to investigate data sets in order to understand their important characteristics

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Five Number Summary

Consists of
1) Smallest data value
2) Q_1
3) Median
4) Q_3
5) Largest data value

Five Number Summary

1. Enter data into L1
2. "stat" button, choose CALC, choose 1-var Stats, press "enter" button and "enter" button again
3. This will give you the five number summary: minX = minimum value, maxX = maximum value, Q1=first quartile, Med=second quartile (or median), Q3=third quartile

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1. Find the five number summary of the following data

23	8	51	42	72
33	2	15	21	13
17	4	5	8	9

Boxplot = a graph of a data set that consists of a line extending from the minimum value to the maximum value, and a box with lines drawn at the first quartile, the median, and the third quartile.

Creating a Boxplot (TI-83/84)

1. Put list in L1
2. "2nd" button, "y=" button
3. Enter on 1: Plot 1 and choose these options:
   - ON
   - Fifth Graph
   - L1
   - 1
4. "zoom" and then choose "ZoomStat" and "enter"
5. "Trace" button to view values.

Drawing a Boxplot (By Hand)

1. Determine the lower and upper fences:
   Lower fence = $Q_1 - 1.5(IQR)$
   Upper fence = $Q_3 + 1.5(IQR)$
2. Draw a number line long enough to include the max and min values. Insert vertical lines at Q_1, M, and Q_3. Enclose these vertical lines in a box
3. Label the lower and upper fences
4. Draw a line from Q_1 to smallest data value larger than lower fence. Draw a line from Q_3 to largest data value that is smaller than upper fence (whiskers)
5. Mark any outliers with an asterisk (*)

2. Draw the boxplot of the following data

18	2	33	81	3
5	7	12	17	13
15	55	72	8	3

(a) Skewed right   (b) Symmetric   (c) Skewed left