PICK UP THE WARM UP

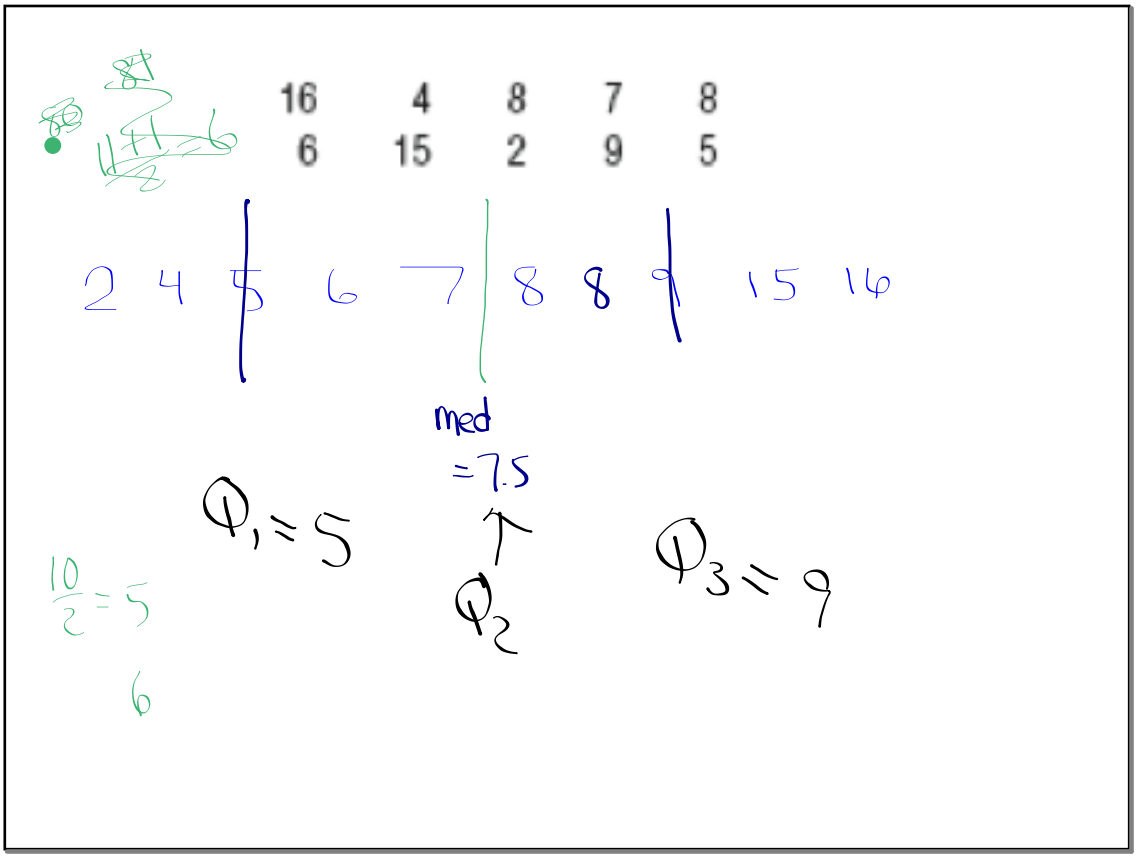
Warm Up

AP Stats Day 1.3 Day 2

How many likes on Instagram for ASA?
The American Statistical Association (www.amstat.org) has an Instagram account (@amstatnews). Here are the number of Instagram likes for 10 posts selected at random:

16	4	8	7	8
6	15	2	9	5

Use the old-fashioned way (no calculators) to find the median (Q_2) and the lower and upper quartiles, Q_1 *and* Q_3



Random HW Check

1.3 Day 2

- ✓ IDENTIFY outliers using the 1.5 × IQR rule.
- ✓ MAKE and INTERPRET boxplots of quantitative data.
- ✓ Use boxplots and numerical summaries to COMPARE distributions of quantitative data.

Informal Hands on Activity to get feel of things

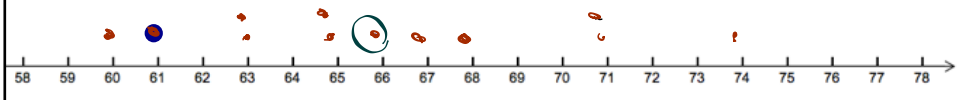
We'll formalize after

Where Do I Stand?

AP Stats 1.3 Day 2

How does my height compare with other AP Stats students?

In pairs, measure each other's height, rounded to the nearest inch. Record your height on the dotplot at the front of the room. Sketch the dotplot.



$Q_1 = 63$ $Q_2 = 66$ $Q_3 = 71$

84

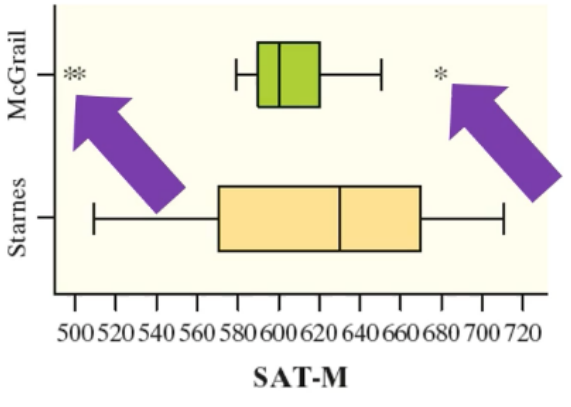
Your teacher will now have all students come to the front.

Outliers

Why look for outliers?

1. They might be inaccurate data values.
2. They can indicate a remarkable occurrence.
3. They can heavily influence the values of some summary statistics, like the mean, range, and standard deviation.

Box Plots were invented in 1970 at Stanford University by a guy named John Tukey.



He intended that they always show outliers, if there are any.

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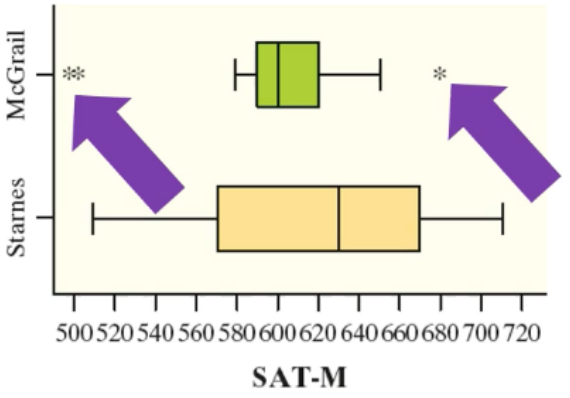


He intended that they always show outliers, if there are any

AP Stats assumes the same thing

If you see a box plot w/o asterisks then there are no outliers.

The same goes if you make one in AP Statistics.

Mystery Man

Manut Bol

7-7"

But since 91 inches won't fit on our scale....

We'll use 82"

Add it and work on #2, #3, and #4

2. What, including Mystery Man, is the median height?
3. What is Q_1 and Q_3?

$Q_1 = 63$ $Q_3 = 71$ $Q_2 = 66$

IQR
$71 - 63 = 8$

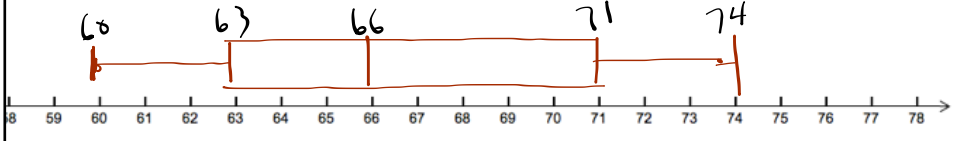
4. An **outlier** is a data value that is way too small or way too big (using the rules below). Are there any outliers? Show your work.

Lower Fence = $Q_1 - 1.5IQR = 63 - 1.5(8) = 51$

Upper Fence = $Q_3 + 1.5IQR = 71 + 1.5(8) = 83$

5. Record the following values and then use them to make a boxplot. Use asterisks for outliers.

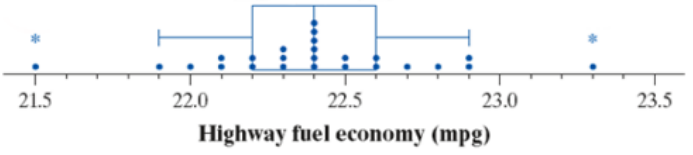
Lower Fence: Q_1: Median: Q_3: Upper Fence:



6. Now go back to the dot plot. Enter all of the heights into your GDC. Make a box plot that matches above.

CAUTION:

- Boxplots do not display each individual value in a distribution.
- Boxplots don't show gaps, clusters, or peaks.



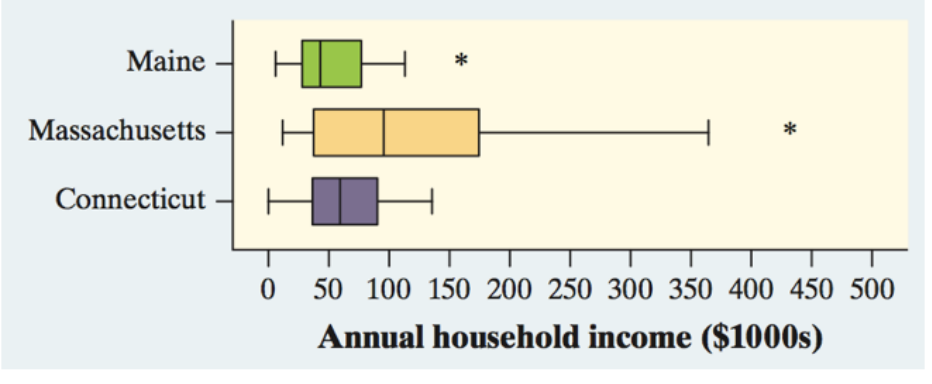
Enter the height data in L1

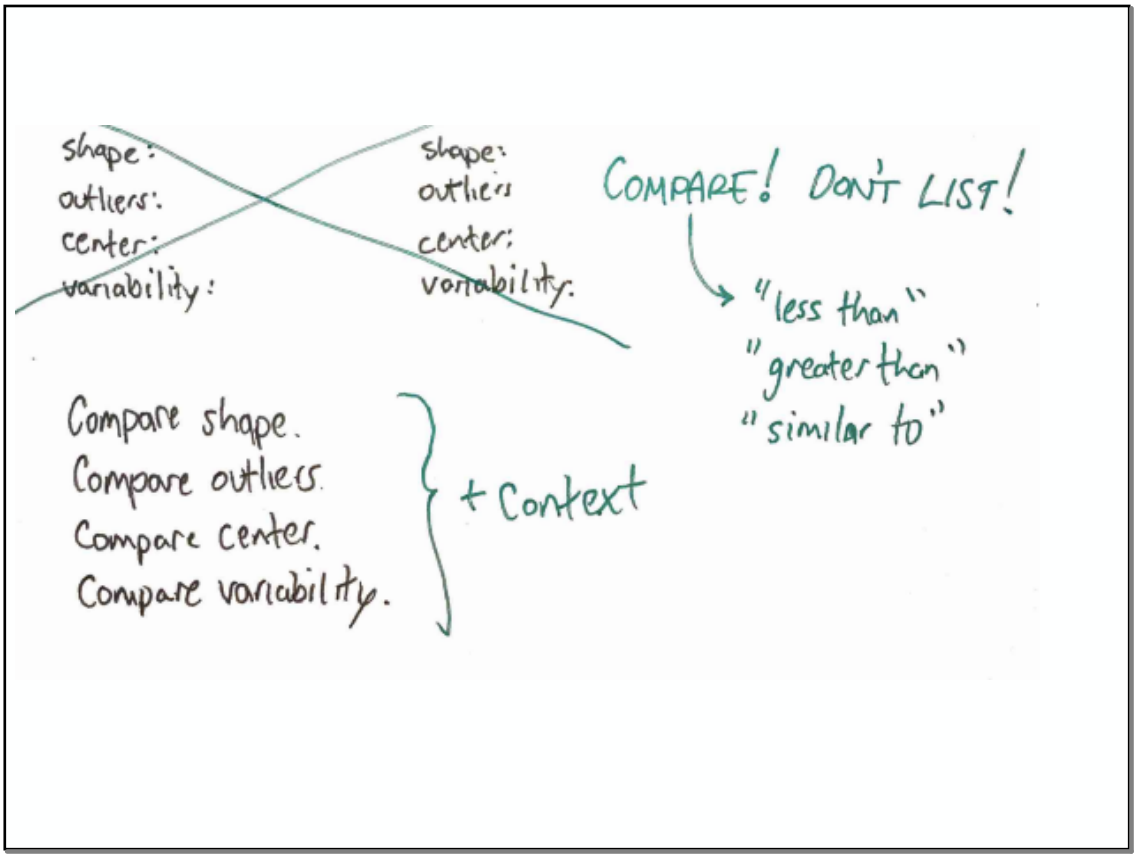
Make a box plot that shows outliers

Comparing Distributions with Box Plots

Check Your Understanding:

The following boxplots show the total income of 40 randomly chosen households each from Connecticut, Maine, and Massachusetts, based on U.S. Census data from the American Community Survey. Compare the distributions of annual incomes in the three states.





Annual household income ($1000s)

context is now established

The shape of the distribution of income for Connecticute is roughly symmetric while Maine incomes are slightly skewed right and Massachusetts incomes have a stronger right skew (note: hard to tell total shape with boxplot)

The center is highest for Massachusetts, followed by Connecticut, then Maine with the lowest.

The variability is highest for Massachusetts, with Maine & Connecticut having similar variability

Maine & Massachusetts each have a high outlier, while Connecticut has none.

Brain Break

There is a matching activity on the last sheet. Finish that as part of your HW.

LCQ

Assignment

finish the matching activity from class and...

1.3....109, 111, 113, 115, 123-126 and finish the

study pp. 66-73