Do Now:

Please get out your homework and answer the following questions....

Find the minimum, first quartile, median, third quartile, and maximum of each data set.

10. 55 53 67 52 50 49 51 52 52

49 50 | 51 52 52 52 53 | 55 57

\[
\begin{array}{c}
\text{So.5} \\
\text{Q1} \\
\text{Median} \\
\text{Q2} \\
\text{Q3} \\
\text{Q4} \\
\end{array}
\]
Homework Check:

Find the minimum, first quartile, median, third quartile, and maximum of each data set.

1. 220 150 200 180 320 330 300
   150, 180, 220, 320, 330
2. 14 18 12 17 14 19 18
   12, 14, 17, 18, 19
3. 33.2 45.1 22.3 76.7 41.9 39 32.2
   22.3, 32.2, 39, 45.1, 76.7
4. 5 8 9 7 11 4 9 4
   4, 4.5, 7.5, 9, 11

Make a box-and-whisker plot to represent each set of data.

7. snack prices: $0.99 $0.85 $1.05 $3.25 $1.49 $1.35 $2.79 $1.99

Snack Prices

8. ticket buyers: 220 102 88 98 178 67 42 191 89

Ticket Buyers
I can...

• make and interpret box and whisker plots
• find quartiles and percentiles
12-4 Box and Whisker Plots

• Quartiles - values that divide a data set into four equal parts.
• Median - separates the data into upper and lower halves.
• First quartile - median of the lower half of data.
• Third quartile - the median of the upper half of the data.
• Interquartile range - difference between the third and first quartiles.
A **box-and-whisker plot** is a graph that summarizes a set of data by displaying it along a number line. It consists of three parts: a box and two whiskers.

- The left whisker extends from the minimum to the first quartile. It represents about 25% of the data.
- The box extends from the first quartile to the third quartile and has a vertical line through the median. The length of the box represents the interquartile range. It contains about 50% of the data.
- The right whisker extends from the third quartile to the maximum. It represents about 25% of the data.
Make a box-and-whisker plot to represent each set of data.

12. song lengths (s): 227 221 347 173 344 438 171 129 165 333
Min - 107
1st Quartile - 199
Median - 300
3rd Q - 375
Max - 413
Problem 3  Interpreting Box-and-Whisker Plots

Weather  Use the box-and-whisker plots below. What do the interquartile ranges tell you about the average monthly rainfall for each city?

Average Monthly Rainfall (in.)

1.8  2  3  4  5  6  7  8  9

Miami, FL
Min

New Orleans, LA
Max

Source: National Climatic Data Center

Middle 50% of Miami’s monthly rainfalls vary more widely than those in New Orleans.
3. What do the medians tell you about the average monthly rainfalls for Miami and New Orleans?

Miami - above 4.5 for half the time and below 4.5 for half the time

New Orleans - below 5.3 half the time and above 5.3 for half the time
16. **Fuel Use** Use the box-and-whisker plots below. What do they tell you about the fuel efficiencies for each type of vehicle? Explain.

- The range of cars is much greater.
- 50% between 18-22
- 50% between 14-16
**Percentiles** separate data sets into 100 equal parts. The **percentile rank** of a data value is the percentage of data values that are less than or equal to that value.

**Problem 4 Finding a Percentile Rank**

Multiple Choice  Of 25 test scores, eight are less than or equal to 75. What is the percentile rank of a test score of 75?

- A 8
- B 17
- C 32
- D 75

\[
\frac{8}{25} = 32\% \quad 68\%
\]

75 or less \quad above 75
4. a. Of the 25 scores in Problem 4, there are 15 scores less than or equal to 85. What is the percentile rank of 85?

b. **Reasoning** Is it possible to have a percentile rank of 0? Explain.

\[
\frac{15}{25} = 60\%.
\]
17. Of 10 test scores, six are less than or equal to 80. What is the percentile rank of a test score of 80?

\[
\frac{6}{10} = 60.0\%\
\]
18. Of 35 judges' scores awarded during a gymnastics event, 28 are less than or equal to 7.5. What is the percentile rank of a score of 7.5?

\[ \frac{28}{35} = 80\% \]
13. Of 350 runners competing in a race, 50 run the race in less than or equal to 20 minutes. What is the percentile rank of the runners who finish in under 20 minutes?

\[ \frac{50}{350} = 14\% \]

HW: WB 12-4

#10, 13, 14, 15, 16