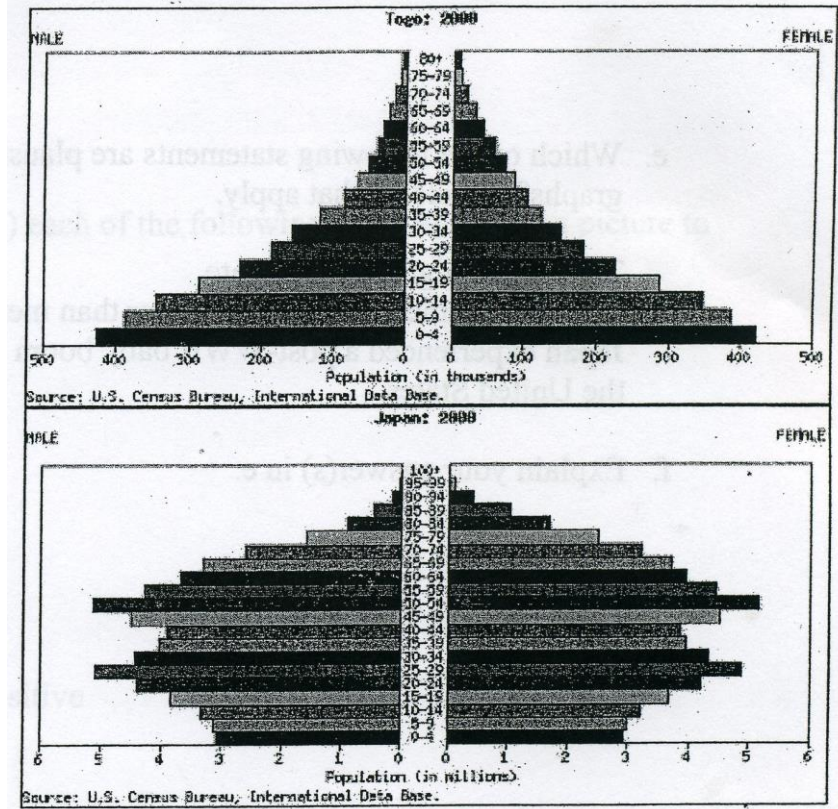


OK for  
Sept 2008

### Chapters 1 - 4 Review

Below are two graphs called population pyramids. They are histograms showing the population of a country broken down by age (vertically) and sex (left and right halves). The vertical axis is age of the nation's citizens and the horizontal axis number of people in each age range. The two countries shown here are Japan and Togo (one of the world's developing nations). Below are some questions that refer to the graphs.



1. What are the approximate median ages for these two populations? (circle one)

Japan, 40-44; Togo, 20-24  
Japan, 50-54; Togo, 0-4

Japan, 40-44; Togo, 35-39

2. In which county is the number of children under age 10 greater? (circle one)

Japan

Togo

You can't tell from the graphs

3. Which of the following statements are plausible, given the graphs? Circle all that apply.

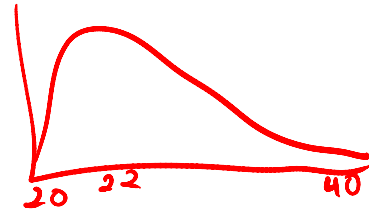
- Togo has a high mortality rate.
- Japanese women tend to live longer than men.
- Japan experienced a post-WWII baby boom similar to that in the United States.

4. What would you expect to be the true distribution of the ages at which college graduates earned their college degree? (circle one)

It would be approximately symmetric.

It would be left-skewed.

It would be right-skewed.



5. Which of the following is a categorical variable?

A

A) a person's hair color

B) miles per gallon

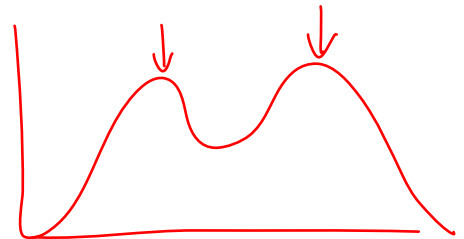
C) hourly pay rate

D) number of children in a household

6. Describe (define) each of the following terms and draw a picture to illustrate.

a. bimodal

the most popular result(s) appear twice. Two peaks.



b. symmetric

the left side of the distribution is the mirror image of the right side.



or



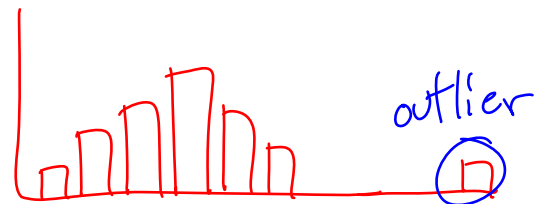
c. skewed positive

right skewed, right tailed, positive values stretch out



d. outlier

pg 93. an unusually large or small data value



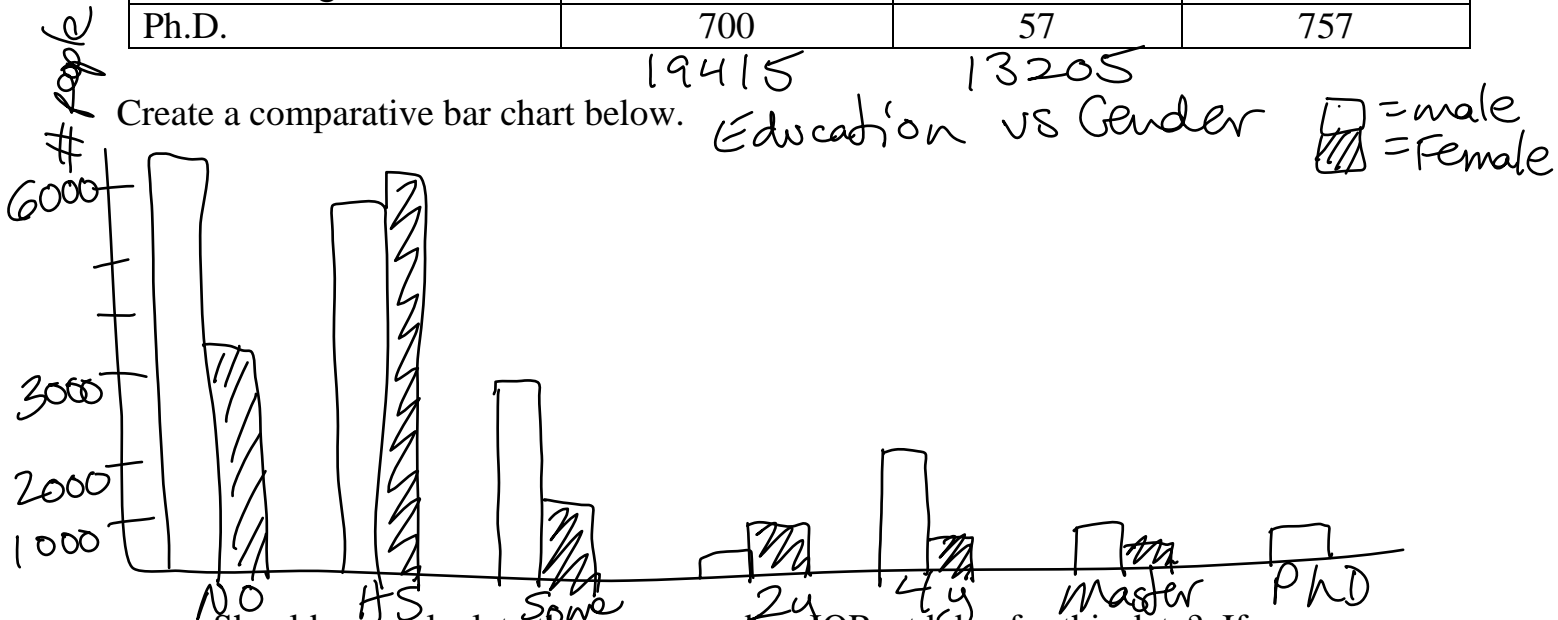
e. heavy tailed

tails do NOT taper off as quickly as the normal curve



7. In a December 2000 report, the US Census Bureau listed the levels of educational attainment for Americans over 65.

Education Level	Male	Female	Total Count
No high school diploma	6500	3445	9945
HS grad, but no college	5701	6000	11701
Some college, no degree	3081	1400	4481
2-year degree	300	1090	1390
4-year degree	2233	900	3133
Master's degree	900	313	1213
Ph.D.	700	57	757



a. Should you calculate the mean, median, IQR, std dev for this data? If yes, explain why....do NOT calculate those statistics.

This is categorical data. I cannot calculate any of these

b. Write a few sentences that describe the display.

men w/ hs diploma is almost double women.  
Roughly same # men + women have HS diploma.  
As # yrs education ↑, # of people decreases.

c. What percent of women over 65 did not attend any college?

$$\frac{9445}{13205} = .715$$

d. What percent of Americans over 65 who received a 4-year degree or higher are male?

$$\frac{3833}{3133 + 1213 + 757} = .751$$

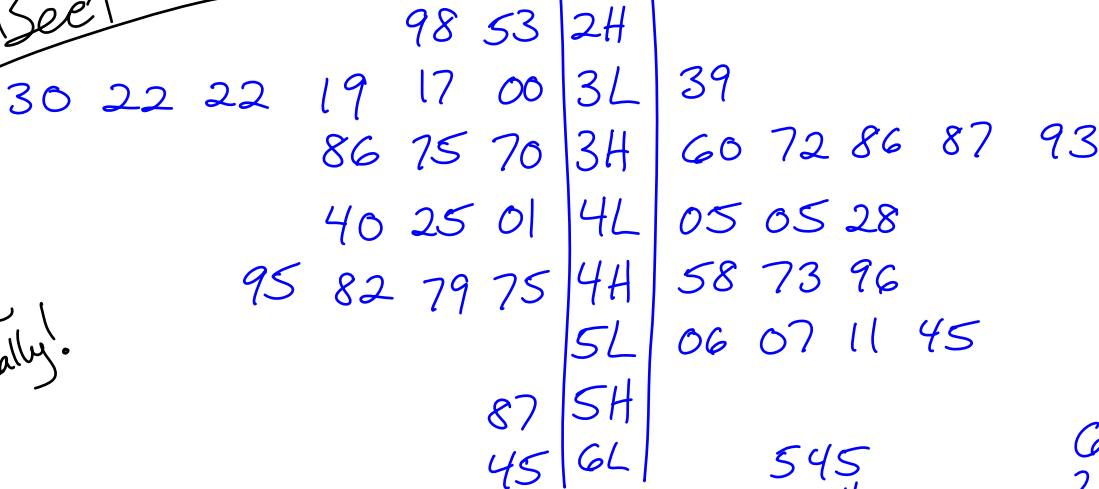
8. Which type of hotdogs has more sodium: beef or turkey?

Create a back-to-back stem and leaf plot comparing the sodium in beef hotdogs to the sodium in turkey hotdogs.

Beef	495	475	425	322	482	587	370	322	479	375
	300	386	401	645	440	317	319	298	253	330
Turkey	458	506	473	545	496	360	387	386	507	393
	372	144	511	405	428	339	405			

Low = 0-4 High = 5-9

Beef



Notice how my data points line up vertically!

stem = 100's leaves = tens/ones

Turkey

545  
144  
645  
253  
392

9. When you describe a graph or compare two distributions, what are the THREE main things that you should be sure to include in your discussion?

Shape, Center, Spread

10. Discuss those three main things relative to the hot dog data above.

The shape of both beef and turkey dogs is roughly symmetrical, although beef is skewed a little high.

The median of beef is half way between 375 + 386 or 380.5.

The median for turkey is 405. The range for beef is 392, turkey 401. Overall, roughly the same.

11. The average gas mileage for several cars manufactured in the United States was compared to the gas mileage of cars manufactured in other countries.

a. Create two separate histograms, one for each set of data, by entering the data into your calculator and then copying the display in the space provided below.

U.S. Cars

16.9 15.5 19.2 18.5 30.0 30.9 20.6 20.8 18.6 18.1 17.0  
17.6 16.5 18.2 26.5 21.9 27.4 28.4 28.8 26.8 33.5 34.2

22 pts =  
4-5 bars

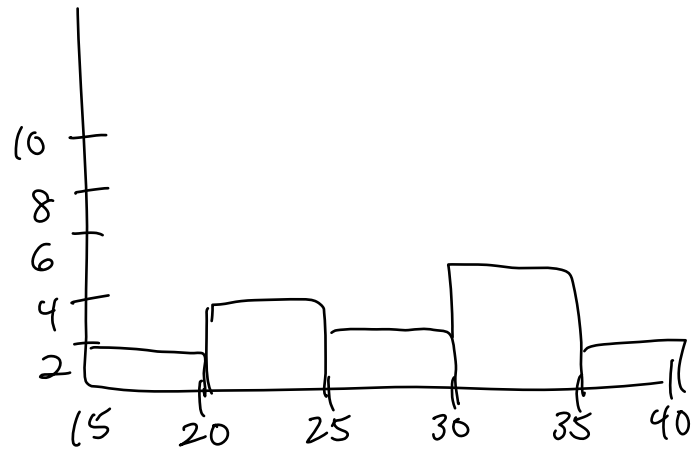
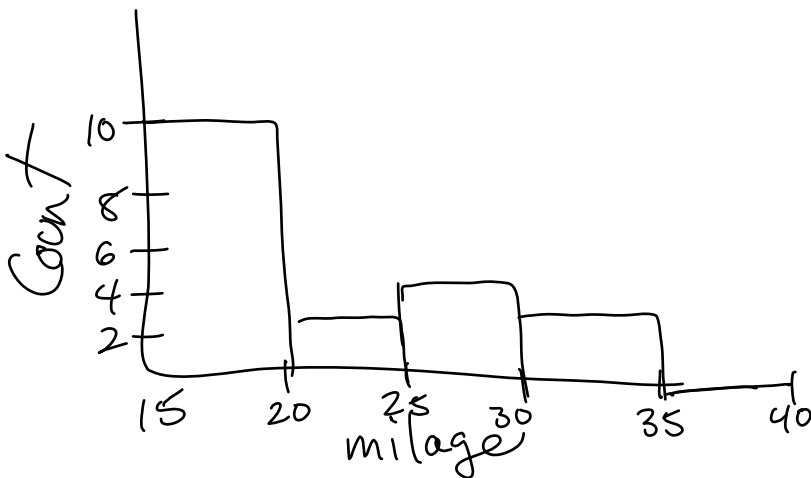
Cars made in Other Countries

16.2 20.3 31.5 30.5 21.5 31.9 37.3 27.5 27.2 34.1 35.1  
29.5 31.8 22.0 17.0 21.6

16 pts =  
4 bars

Gas Mileage for U.S. Cars

Gas Mileage for Other Cars



b. Compare the three main things for these two distributions.

US is uni-modal at 17-19. Other is bimodal at 21-23, and 31-33. Range is almost identical being 15.5-34.2 = 18.7. Range is 16.2-35.1 = 18.9. median = 20.8. median = 27.7

c. Which cars get better gas mileage: those made in the U.S. or those made in other countries? Explain.

Based strictly on median, US = 20.8, foreign = 27.7 so Foreign definitely get better gas mileage.

In a AP psychology study of distance perception, student volunteers were given 5, 10, or 15 extra credit points depending on their level of participation in the experiment. They walked along paths laid out along hallways in the psychology building and were asked to estimate the distance they had walked. Each path was between 100 and 200 feet in length, and contained from two to seven right angle turns. The investigators also kept track of class standing (Frosh, Soph, Junior, Senior). For each of the variables in this study, determine whether it is **categorical or numerical**. For each numerical variable, determine whether it is **discrete or continuous**.

1. the true length of path. *Numerical Continuous*
2. the amount of extra credit given to volunteers. *Numerical discrete*
3. the time it took to walk the path. *Numerical continuous*
4. the number of right angle turns. *Numerical discrete*
5. Class level *categorical*