Solutions to …

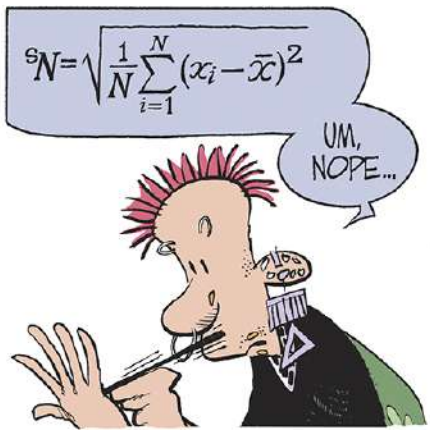
- **"Check for Understanding" are in the back of the book starting on page S-1**
- **Exercises are posted on my Website**

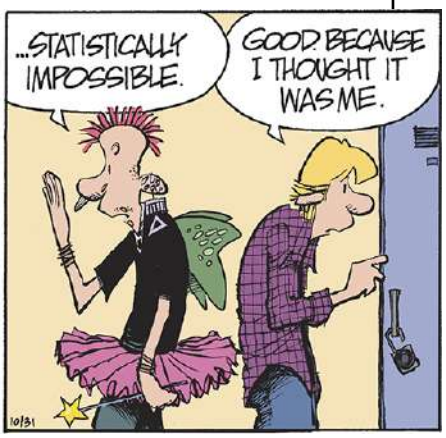
Word Documents for these Reading Notes are on my website so that you can type your notes if you wish.

Chapter 1: Exploring Data

Key Vocabulary:

- individual
- variable
- frequency table
- relative frequency table
- distribution
- pie chart
- bar graph
- two-way table
- marginal distributions
- conditional distributions
- side-by-side bar graph
- association
- dotplot
- stemplot
- histogram
- SOCS
- outlier
- symmetric
- Σ
- $\bar{x}$
- spread
- variability
- median
- quartiles
- Q_1, Q_3
- IQR
- five-numb
- summary
- minimum
- maximum
- boxplot
- resistant
- standard d
- variance





Data Analysis: Making Sense of Data (pp.2-6)

1. *Individuals* are…

2. A *variable* is …

3. When you first meet a new data set, ask yourself:

    - Who…
    - What…
    - Why, When, Where and How…

4. Explain the difference between a *categorical* variable and a *quantitative* variable. Give an example of each.

5. Give an example of a categorical variable that has number values.

6. Define *distribution*:

7. Answer the two questions for the *Check Your Understanding* on page 5*:*

8. Define *inference.*

1.1 Analyzing Categorical Data (pp.8-22)

1. A *frequency* table displays…

2. A *relative frequency table* displays…

3. What type of data are *pie charts* and *bar graphs* used for?

4. *Categories* in a bar graph are represented by _____ and the *bar heights* give the category _____.

5. What is a *two-way table*?

6. Define *marginal distribution*.

7. Answer the two questions for the *Check Your Understanding* on page 14.

8. What is a *conditional distribution*? Give an example demonstrating how to calculate one set of conditional distributions in a two-way table.

9. What is the purpose of using a *segmented bar graph*?

10. Answer question one for the *Check Your Understanding* on page 17.

11. Describe the four steps to organizing a statistical problem:

    - State…
    - Plan…
    - Do…
    - Conclude…

12. Explain what it meant by an *association* between two variables.

~~**13. SKIP SIMPSON'S PARODOX.**~~

1.2 Analyzing Categorical Data (pp.27-42)

1. What is a *dotplot*? Draw an example.

2. When examining a distribution, you can describe the overall pattern by its

   S_____ O_____ C_____ S_____

3. Describe Shape

   a) If a distribution is symmetric, what does it look like?

   b) If a distribution is *skewed to the right*, what does it look like?

   c) If a distribution is *skewed to the left*, what does it look like?

   d) Describe and illustrate the following distributions:

      i) Unimodal

      ii) Bimodal

      iii) Multimodal

4. Answer questions 1-4 for the *Check Your Understanding* on page 31.
5. How are a *stemplot* and a *histogram* similar?
6. When is it beneficial to *split the stems* on a stemplot?
7. When is it best to use a *back-to-back stemplot*?
8. List the three steps involved in making a histogram.
9. Why is it advantageous to use a relative frequency histogram instead of a frequency histogram?
10. Answer questions 2-4 for the *Check Your Understanding* on page 35.
11. Do *Technology Corner (*page 38) problem and sketch your graphs.
12. Answer *Check Your Understanding* questions on pages 39.
13. Answer *Check Your Understanding* questions on pages 41.

1.3 Analyzing Categorical Data (pp.50-67)

Describe Center

1. Explain how to calculate the *mean,* $\bar{x}$.
2. What is the meaning of $\sum$?
3. Explain the difference between $\bar{x}$ and μ.
4. **Define *resistant measure.***

5. Explain why the mean is not a resistant measure of center.

6. What is the *median* of a distribution? Explain how to find it.

7. Explain why the median is a resistant measure of center?

8. How does the shape of the distribution affect the mean and median?

9. Answer *Check Your Understanding* questions on page 55.

Describe Spread and Outliers

10. What is the *range*?
11. Is the range a resistant measure of spread? Explain.

12. How do you find *first quartile* Q_1 and *third quartile* Q_3?

13. What is the *Interquartile Range* (IQR)?

14. Is the IQR and the quartiles a resistant measure of spread? Explain.

15. How is the IQR used to identify *outliers*?

16. What is the *five-number summary* of a distribution?

17. Explain how to use the five-number summary to make a *boxplot*.

18. Answer *Check Your Understanding* questions on page 61.

19. Do *Technology Corner (*page 61) problem and sketch your graphs.

20. What does the *standard deviation* measure? How do we calculate it?

21. What is the relationship between *variance* and *standard deviation*?

22. What are the *properties* of the standard deviation as explained on page 64?

23. Answer *Check Your Understanding* questions on page 64.

24. Do *Technology Corner (*page 65) problem and give the summary statistics

25. How should one go about choosing measures of center and spread?