

# AP Statistics Summer Assignment

## June 2009

**Purpose:** To have the student review several statistical concepts that the student was exposed to during Algebra I and Algebra II as well as begin to discover the writing involved in communicating statistics.

**Materials:** - notebook or binder in which to keep your notes and problems  
- TI-83 or TI-83 Plus graphing calculator (if there is a problem see me)

### Assignment:

**Part 1:** Read, learn, and take notes on the concepts below that can be found online in statistics glossaries, such as:

[http://www.stats.gla.ac.uk/steps/glossary/presenting\\_data.html](http://www.stats.gla.ac.uk/steps/glossary/presenting_data.html),

<http://davidmlane.com/hyperstat/glossary.html>, or

<http://www.stat.berkeley.edu/~stark/SticiGui/Text/gloss.htm>

#### Data Types:

Discrete vs. Continuous Data  
Categorical vs. Quantitative  
Individual (Subject) vs. Variable

#### Pie Chart

Frequencies / Frequency Table  
Relative Frequency  
Roundoff Error

#### Displaying Data:

Distribution  
Bar Graph vs. Histogram  
Count vs. Percent  
Stem Plot  
Box and Whisker Plot  
Dot Plot  
Back to Back (split stem) Stem Plot

#### Examining Distributions:

overall pattern / deviations  
center / shape / spread  
outlier  
symmetric / skewed  
mode(s)  
quartile  
interquartile range

**Part 2:** Complete the problems on the attached sheet.

Many of these topics are already familiar to you and so this assignment will be mostly about refreshing your memory. Any new concepts are simple enough for you to pick up on your own.

I expect you to attempt each problem and do as much of each one as you can. **I will address your uncertainties when you return to school.** It is acceptable to work on this assignment with a friend as long as you each do all the problems, because you will be individually responsible for all the work.

I also expect you to master some basic statistical functions on your calculator. If you don't know how to put data into a list and create a graph, then you will need to refer to the manual that came with your calculator that addresses these issues.

You will be graded on the whole assignment and it will be turned in on the first day of class. This assignment will be worth 30 points and will be graded for completion and accuracy. Should you have any questions over the summer, you can try to reach me through e-mail at [Laura.Strano@fcps.edu](mailto:Laura.Strano@fcps.edu)

Attached sheet: **Problem Set**

**1. FUEL-EFFICIENT CARS**

Here is a small part of the data set that describes the fuel economy (in miles per gallon) of 1998 model motor vehicles:

<b>Make and Model</b>	<b>Vehicle Type</b>	<b>Transmission Type</b>	<b>Number of Cylinders</b>	<b>City MPG</b>	<b>Highway MPG</b>
:					
BMW 318I	Subcompact	Automatic	4	22	31
BMW 318I	Subcompact	Manual	4	23	32
Buick Century	Midsize	Automatic	6	20	29
Chevrolet Blazer	Four-wheel drive	Automatic	6	16	20
:					

- a) What are the individuals in this data set?
- b) For each individual, what variables are given? Which of these variables are categorical and which are quantitative?

**2. MEDICAL STUDY VARIABLES**

Data from a medical study contain values of many variables for each of the people who were the subjects of the study. Which of the following variables are categorical and which are quantitative?

- a) Gender (female or male)
- b) Age (years)
- c) Race (Asian, black, white, or other)
- d) Smoker (yes or no)
- e) Systolic blood pressure (millimeters of mercury)
- f) Level of calcium in the blood (micrograms per milliliter)

**3. FEMALE DOCTORATES**

Here are the data on the percent of females among people earning doctorates in 1994 in several fields of study:

Computer Science	15.4%	Life Sciences	40.7%
Education	60.8%	Physical Sciences	21.7%
Engineering	11.1%	Psychology	62.2%

- a) Present these data in a well-labeled bar graph.
- b) Would it also be correct to use a pie chart to display these data? If so, construct the pie chart. If not, explain why not.

#### 4. ACCIDENTAL DEATHS

In 1997 there were 92,353 deaths from accidents in the United States. Among these were 42,340 deaths from motor vehicle accidents, 11,858 from falls, 10,163 from poisoning, 4051 from drowning, and 3601 from fires.

- Find the percent of accidental deaths from each of these causes, rounded to the nearest percent. What percent of accidental deaths were due to other causes?
- Make a well-labeled bar graph of the distribution of causes of accidental deaths. Be sure to include an "other causes" bar.
- Would it also be correct to use a pie chart to display these data? If so, construct the pie chart. If not, explain why not.

#### 5. DRP TEST SCORES

There are many ways to measure the reading ability of children. One frequently used test is the Degree of Reading Power (DRP). In a research study on third-grade students, the DRP was administered to 44 students. Their scores were:

40	26	39	14	42	18	25	43	46	27	19
47	19	26	35	34	15	44	40	38	31	46
52	25	35	35	33	29	34	41	49	28	52
47	35	48	22	33	41	51	27	14	54	45

Display these data graphically (using a stemplot). Write a paragraph describing the distribution of DRP scores.

#### 6. DRP SCORES REVISITED

Refer to Exercise 5. Make a histogram of the DRP test scores for the sample of 44 children. Be sure to show your frequency table. Which do you prefer: the stemplot from Exercise 5 or the histogram that you just constructed? Why?

#### 7. CEO SALARIES

In 1993, Forbes magazine reported the age and salary of the chief executive officer (CEO) of each of the type 59 businesses. Here are the salary data, rounded to the nearest thousand dollars:

145	621	262	208	362	424	339	736	291	58	498	643	390	332
750	368	659	234	396	300	343	536	543	217	298	1103	406	254
862	204	206	250	21	298	350	800	726	370	536	291	808	543
149	350	242	198	213	296	317	482	155	802	200	282	573	388
250	396	572											

Construct a histogram for these data. Describe the shape, center, and the spread of the distribution of the CEO salaries. Are there any apparent outliers?

### 8. SHOPPING SPREE

The figure below is an ogive (relative cumulative frequency graph) of the amount spent by 50 grocery shoppers.

- Estimate the center of this distribution. Explain your method.
- At what percentile would the shopper who spent \$17.00 fall?
- Draw a histogram that corresponds to the ogive.



9. What type of graph or graphs would you plan to make in a study of each of the following issues?

- What makes of cars do students drive? How old are their cars?
- How many hours per week do students study? How does the number of study hours change during a semester?
- Which radio stations are most popular with students?

### 10. MURDER WEAPONS

The 1999 *Statistical Abstract of the United States* reports FBI data on murders for 1997. In that year, 53.3% of all murders were committed with handguns, 14.5% with other firearms, 13.0% with knives, 6.3% with a part of the body (usually the hands or feet), and 4.6% with blunt objects. Make a graph to display these data. Do you need an "other methods" category?