

MGT 2250 Management Statistics

Sample Final Part 1

1. Car Auction Each row of data indicates the make of vehicles sold at auction in the US in 2010. The data table describes 1,884 vehicles.

- (a) Using software, tabulate the frequencies of the makes of cars.
- (b) What is the mode of the make of car?
- (c) Generate a pie chart that shows all of the relative frequencies. What's a problem with this chart?
- (d) Recode the variable that identifies the make of the car so that the resulting pie chart distinguishes the shares of the top five makes. Draw the new pie chart.

2. Information Industry This data table includes several characteristics of 428 companies classified as being in the information industry in 2010. One column gives the total revenue of the company, in millions of dollars.

- (a) Find the median, mean, and standard deviation of the total revenue of these companies. What units do these summary statistics share?
- (b) Describe the shape of the histogram and boxplot. What does the White Space Rule have to say about the histogram?
- (c) Do the data have any extreme outliers? Identify the company if there's an extreme outlier.
- (d) What do these graphs of the distribution of net sales tell you about this industry? Is the industry dominated by a few companies, or is there a level playing field with many comparable rivals?

3. Gasoline sales A service station near an interstate highway sells three grades of gasoline: regular, plus, and premium. During the last week, the manager counted the number of cars that purchased these types of gasoline. He kept the counts separate for weekdays and the weekend. The data table has two categorical variables. One distinguishes weekdays from weekends, and the other indicates the type of gas (regular, plus, or premium).

- (a) Find the contingency table defined by the day of the week and the type of gas. Include the marginal distributions.
- (b) Find the conditional distribution of purchase type for weekday purchases.
- (c) Find the conditional distribution of premium purchases during the week and weekend.
- (d) Does the fact that your answers to parts (b) and (c) are different indicate association?
- (e) The owner of the station would like to develop better ties to customers who buy premium gas. (The owner expects these customers to be more affluent and likely to purchase other services from the station.) If the owner wants to meet more of these customers, when should the owner be around the station: on weekdays or weekends?

4. Philadelphia Housing These data describe housing prices in the Philadelphia area. Each of the 110 rows of this data table describes a region of the metropolitan area. (Several make up the city of Philadelphia.) One column, labeled Selling Price, gives the median price for homes sold in that area during 1999 in thousands of dollars. Another, labeled Crime Rate, gives the number of crimes committed in that area, per 100,000 residents.

- (a) Make a scatterplot of the selling price on the crime rate. Which observation stands out from the others? Is this outlier unusual in terms of either marginal distribution?
- (b) Find the correlation using all of the data as shown in the prior scatterplot.
- (c) Exclude the distinct outlier and redraw the scatterplot focused on the rest of the data. Does your impression of the relationship between the crime rate and selling price change?
- (d) Compute the correlation without the outlier. Does it change much?
- (e) Can we conclude from the correlation that crimes in the Philadelphia area cause a rise or fall in the value of real estate?