Problem Set for Chapter 2: Graphical Descriptive Techniques
Eco249 Statistics   Queens College   K. Matsuda

Excel Assignments (You need to hand in these.)
You solve the following problems using Excel and you are required to hand in the print outs (not diskette) of your report by the due Matsuda determines. You should work individually. Don't be a copy of somebody else. Originality and creativity are very important. And the way you present your thoughts matter.

[2.1](2 points)

Example 2.1 (page 31)
In the last decade, a number of companies have been created to compete in the long-distance telephone business. As part of a larger study, one such company wanted to acquire information about the monthly bills of new subscribers in the first month after signing with the company. The company's marketing manager conducted a survey of 200 new residential subscribers wherein the first month's bills were recorded. These data are listed below and stored in file Xm02-01. The general manager planed to present his findings to senior executives. What information can be extracted from these data?

Create the exactly same histogram which appears on the page 33 of the required textbook. Refer to the page 33-34 of the required textbook for step by step instructions.

[2.2](5 points)

The volume of water used by each of a sample of 350 households in Kuwano (where Matsuda was born) was measured (in gallons) and stored in file 'Water'.

   a. Draw a frequency histogram and distribution using Excel. (Frequently asked question is "What is frequency distribution?". We learned it in class.)
   b. What is the shape of the histogram?
   c. What does the histogram tell you?

[2.3](2 points)

Example 2.4 (page 49)
The student placement office at a university conducted a survey of last year's business school graduates to determine the general areas in which the graduates found jobs. The placement office intended to use the resulting information to help decide where to concentrate its efforts in attracting companies to campus to conduct job interviews. Each graduate was asked in which area he or she found a job. The areas of employment are:
   1. Accounting
   2. Finance
   3. General management
   4. Marketing/Sales

5. Other

The data are stored in file Xm02-04 using the codes 1, 2, 3, 4, and 5, respectively. Summarize the data by producing an appropriate chart.

Create the **exactly** same bar chart which appears on the page 50 of the required textbook. Refer to the page 50 of the required textbook for step by step instructions.

Create the **exactly** same pie chart which appears on the page 51 of the required textbook. Refer to the page 51 of the required textbook for step by step instructions.

[2.4](5 points)

Each year *Forbes* magazine conducts a salary survey of chief executive officers. In addition to salary information, *Forbes* collects and reports personal data on the CEOs, including level of education. Do most CEOs have advanced degrees, such as masters degrees or doctorates? The data in the table represent the highest degree obtained for each of the top 25 best-paid CEOs of 1999.
   a. Create bar and pie charts. Use the following coding: None = 0, Bachelors = 1, Masters = 2, JD = 3, LLB (law) = 4, Doctorate = 5.
   b. What is your opinion about whether most CEOs have advanced degrees?

CEO	Company	Degree
1. Michael D. Eisner	Walt Disney	Bachelors
2. Mel Karmazin	CBS	Bachelors
3. Stephen M. Case	America Online	Bachelors
4. Stephen C. Hilbert	Conseco	none
5. Craig R. Barrett	Intel	Doctorate
6. Millard Drexler	GAP	Masters
7. John F. Welch, Jr.	General Electric	Doctorate
8. Thomas G. Stemberg	Staples	Masters
9. Henry R. Silverman	Cendant	JD
10. Reuben Mark	Colgate-Palmolive	Masters
11. Philip J. Purcell	Morgan Stanley Dean Witter	Masters
12. Scott G. McNealy	Sun Microsystems	Masters
13. Margaret C. Whitman	eBay	Masters
14. Louis V. Gerstner, Jr.	IBM	Masters
15. John F. Gifford	Maxim Integrated Products	Bachelors
16. Robert L. Waltrip	Service Corp. International	Bachelors
17. M. Douglas Ivester	Coca-Cola	Bachelors
18. Gordon M. Binder	Amgen	Masters
19. Charles R. Schwab	Charles Schwab	Masters
20. William R. Steere, Jr.	Pfizer	Bachelors
21. Nolan D. Archibald	Black & Decker	Masters
22. Charles A. Heimbold, Jr.	Bristol-Myers Squibb	LLB (law)

Turn to the next page!

23. William L. Larson   Network Association   JD
24. Maurice R. Greenberg   American International Group   LLB (law)
25. Richard Jay Kogan   Schering – Plough   Masters

[2.5](2 points)

Example 2.7 (page 58)

A real estate agent wanted to know to what extent the selling price of a home is related to its size. To acquire this information he took a sample of 12 homes that had recently sold, recording the price in thousands of dollars and the size in hundreds of square feet. These data are listed in the table and are stored in file Xm02-07. Use a graphical technique to describe the relationship between size and price.

Size	Price ($000s)
23	315
18	229
26	355
20	261
22	234
14	216
33	308
28	306
23	289
20	204
27	265
18	195

Create the exactly same scatter diagram which appears on the page 59 of the required textbook. Refer to the page 59-60 of the required textbook for step by step instructions.

[2.6](5 points)

Critics of television often refer to the detrimental effects that all the violence shown has on children. However, there may be another problem. It may be that watching television also reduces the amount of physical exercise, causing weight gains. A sample of 225 10-year-old children was taken. The number of pounds each child was overweight was recorded (a negative number indicates the child is underweight). Additionally, the number of hours of television viewing per week was also recorded. Both variables are stored in file 'TV and weight'.
    a. Draw a scatter diagram with a straight line.
    b. What is the direction of the line?
    c. What does the scatter diagram tell you?

[2.7](2 points)

Example 2.9 (page 69)

The total amounts of income tax paid by individuals in the United States in the years 1987 to 1999 are listed below and stored in file Xm02-09. Draw a graph of these data and describe the information produced.

Year	Income Tax (in $millions)
1987	470,585
1988	480,710
1989	521,287
1990	548,198
1991	546,810
1992	564,555
1993	593,752
1994	625,483
1995	685,528
1996	754,877
1997	847,761
1998	940,402
1999	1,031,712

Create the exactly same line chart which appears on the page 70 of the required textbook. Refer to the page 70 of the required textbook for step by step instructions.

[2.8](5 points)

Since 1958, air samples have been collected hourly at Mauna Loa Observatory, Hawaii, for the purpose of determining the carbon dioxide (CO_2) concentration. The Mauna Loa atmospheric data constitute the longest continuous record of atmospheric CO_2 concentrations in the world. Since local influences of vegetation or human activity are minimal at Mauna Loa, these data are considered by experts to be a reliable indicator of the trend in atmospheric CO_2 concentrations in the middle layers of the troposphere (Keeling, C.D., and Whorf, T.P., Scripps Institution of Oceanography, Aug. 2000). The data stored in file 'CO2' are the average annual CO_2 measurements (in parts per million) during April at Mauna Loa from 1981 to 1999.

  a. Construct a scatter plot for the data, with year on the horizontal axis and CO_2 concentration on the vertical axis.
  b. Do you detect a trend in atmospheric CO_2 concentrations at Mauna Loa? If so, describe the nature of the relationship.

Exercises for Your Better Understanding (You don't have to hand in these.)

Exercise 2.4 on page 30 (You can find the solution on the required textbook.)
The placement office at university regularly surveys the graduates 1 year after graduation and asks for the following information. For each, determine the type of data.
- a. What is your occupation?
- b. What is your income?
- c. What degree did you obtain?
- d. What is the amount of your student loan?
- e. How would you rate the quality of instruction?

Exercise 2.6 on page 30 (You can find the solution on the required textbook.)
A sample of shoppers at a mall was asked the following questions. Identify the type of data each question would produce.
a. What is your age?
b. How much did you spend?
c. What is your marital status?
d. Rate the availability of parking: excellent, good, fair, or poor
e. How many stores did you enter?

Exercise 2.8 on page 30 (You can find the solution on the required textbook.)
Baseball fans are regularly asked to offer their opinions about various aspects of the sport. A survey asked the following questions. Identify the type of data.
- a. How many games do you attend annually?
- b. How would you rate the quality of entertainment? (excellent, very good, good, fair, poor)
- c. Do you have season tickets?
- d. How would you rate the quality of the food? (edible, barely edible, or horrible)

For further exercises refer to Chapter 2 of the textbook.