CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

ETT 101 Lab Elena Harris

Lab 6: Excel Assignment "Data Analysis"

Due date: (during lab)

Introduction / Background

As an engineer you will be required to analyze or present data. Using graphical representations of data helps to understand a problem at hand better and helps to discern possible tendencies in data. In this lab we will discuss some of the graphical representations and learn how to choose a graph for a given set of data.

Line graphs. A Line graph is used to show the trend of data over time.
Example. The population (in millions) of the US for the years 1860-1950 is as follows: 31.4 in 1860; 39.8 in 1870; 50.2 in 1880; 62.9 in 1890; 76.0 in 1900; 92.0 in 1910; 105.7 in 1920; 122.8 in 1930; 131.7 in 1940; and 151.1 in 1950.

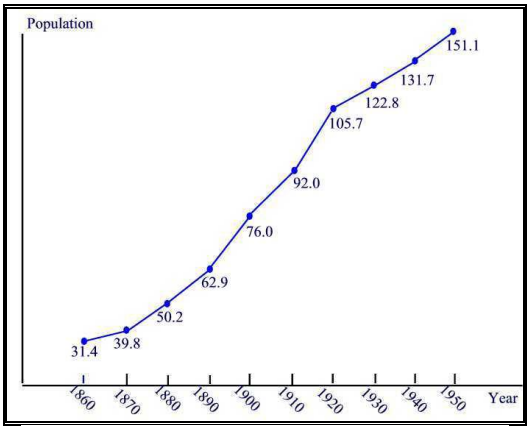

Figure 1. Example of a line graph.

Bar graphs. Bar graphs are used to convey information about categorical data where the horizontal scale represents some attribute and the length of a bar represents the quantity compared. Bar graphs allows at one glance to determine which item has the best quality.

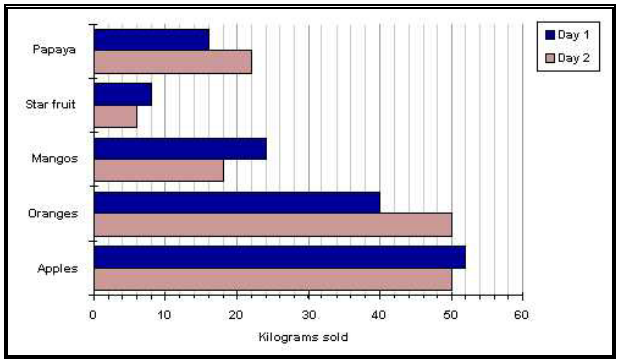

Figure 2. Example of a bar graph.

Combination graphs. Sometimes it is more convenient to combine two basic charts into one graph. For example, in Figure 3, four different software are compared in terms of two measurements: mapped bases and mapping accuracy (you do not have to understand these measurements). The measurements were taken in five different categories (read length). Bars in this chart correspond to the left y-axis (mapped bases), and lines correspond to the right y-axis (mapping accuracy). We can read from this graph that software Bismark-bowtie 1 has the highest accuracy in all five experiments, and if we look at the experiment with read length 250, we notice that BS-seeker software has the least mapped bases (bars). This graph allows users to compare software in terms of two different measurements at a single glance.

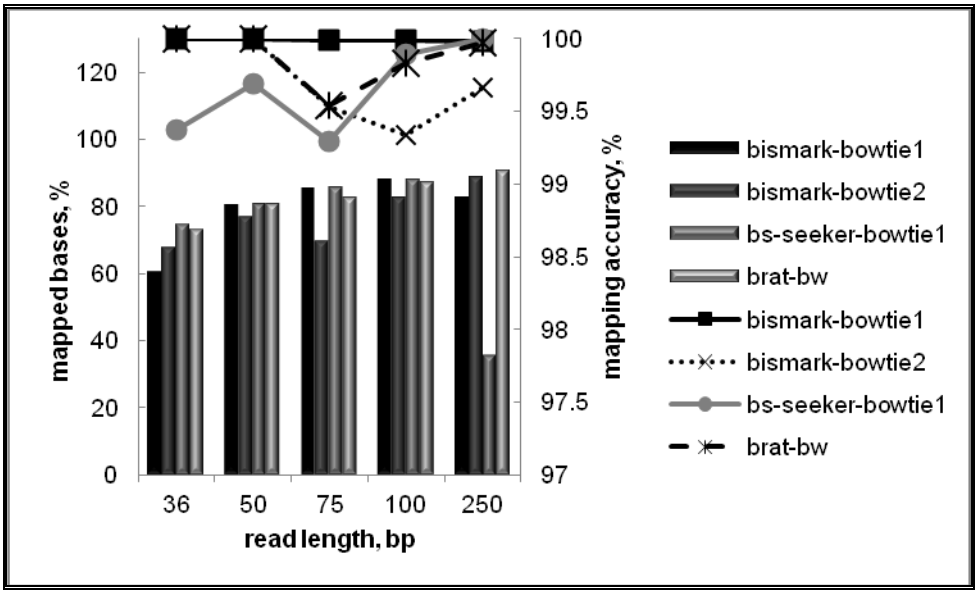

Figure 3. Example of a combination graph.

Pie graphs. A pie chart is used when we need to compare the proportions of categories within the whole. You already used a pie chart to analyze your weekly schedule in Lab 3.

Scatter plot. A relationship between two sets of data is sometimes determined by using a scatter plot. If there is a correlation between two variables, then the data will resemble a line. If dots on a plot a scattered in no particular order, then there is no correlation between two variables. In Figure 4, ice cream sales are positively (the slope of a line is positive) correlated with daily temperature.

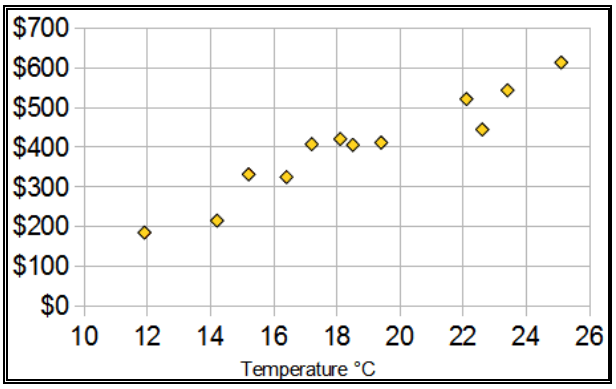

Figure 4. Example of a scatter plot.

Objectives

- Given a data set, identify which graphical representation will be most effective for this data.
- Practice using Excel for graphical representations of data.

Assignment details

For given data sets, make appropriate charts in Excel then copy the charts into a Word document.

Data set 1. We have data on monthly precipitation and average temperature over one year and we want to observe possible tendencies in both categories (combination graph).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precipitation	94	75	104	103	114	88	106	103	103	89	102	98
Average Temperature	-1	0	4	10	16	21	24	23	19	13	7	2

Figure 5. Raw data for data set 1.

Data set 2. Consider the question of whether studying longer for a test will lead to better scores. A collection of data is given below (scatter plot):

Study Hors	3	5	2	6	7	1	2	7	1	7
Score	80	90	75	80	90	50	65	85	40	100

Figure 6. Raw data for data set 2.

Data set 3. The total population of the UK is given below and broken by male and female categories. Represent this data so that we could compare male/female population over the years (bar or column plot).

Year	Total	Male	Female
1959	51,956,000	25,043,000	26,913,000
1969	55,461,000	26,908,000	28,553,000
1979	56,240,000	27,373,000	28,867,000
1989	57,365,000	27,988,000	29,377,000
1999	59,501,000	29,299,000	30,202,000

Figure 7. Raw data for data set 3.

Lab Submission:

- Your final document must be in Word.
- Include your justification for using a particular chart for a specific data set.
- Include your charts in the Word document and name them accordingly (Figure 1, Figure 2, …) in a similar format as examples in this lab assignment (centered, with borders, and with titles).
- Show your work to the instructor to receive credit.
- Due time by 5:50 P.M.