

Tutorial 1

CB2200 Business Statistics

September 7, 2020

Intended Learning Outcomes

After this tutorial, you may know how to

- differentiate variables' types.
- construct a frequency distribution, percentage distribution and cumulative percentage distribution based on a data table.
- construct a histogram.
- evaluate a graph. (Graph analysis)

Question 1

- For each of the following variables, determine whether the variable is categorical or numerical. If the variable is numerical, determine whether the variable is discrete or continuous.
 - a) Number of cell phones in a household
 - b) Length of the longest phone call made in a month
 - c) Whether the household has a land line
 - d) Whether there is a high-speed Internet connection in the household

- Q1

For each of the following variables, determine whether the variable is categorical or numerical. If the variable is numerical, determine whether the variable is discrete or continuous.

- a) Number of cell phones in a household **Numerical, discrete**
- b) Length of the longest phone call made in a month
Numerical, continuous
- c) Whether the household has a land line **categorical**
- d) Whether there is a high-speed Internet connection in the household **categorical**

Question 2

Q2

The following data is about the cost of electricity (in \$) during July 2014 for a random sample of 50 one-bedroom apartments in a large city.

96	171	202	179	147	102	153	197	127	82
157	185	90	116	175	111	148	213	130	165
141	149	206	175	123	128	144	168	109	167
95	163	150	154	130	143	187	166	139	149
108	119	183	151	114	135	191	137	129	158

- Construct a frequency distribution and a percentage distribution that have class intervals with the upper class boundaries \$99, \$119, and so on.
- Construct a cumulative percentage distribution.
- Construct a histogram.
- What is the total frequency of cost to be at least \$120 but less than \$180?

Question 2

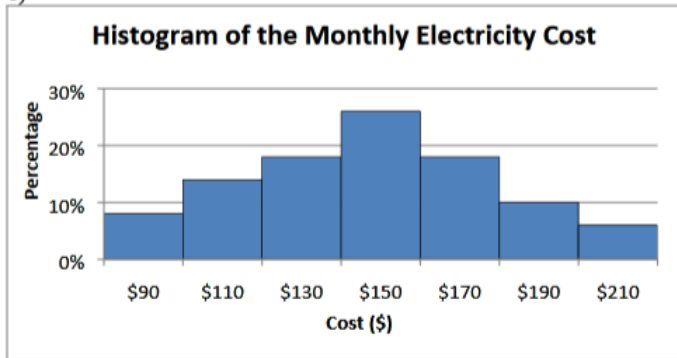
Q2

a) and b)

	Frequency	Percentage	Cumulative Percentage
\$80 - Less than \$100	4	8%	8%
\$100 - Less than \$120	7	14%	22%
\$120 - Less than \$140	9	18%	40%
\$140 - Less than \$160	13	26%	66%
\$160 - Less than \$180	9	18%	84%
\$180 - Less than \$200	5	10%	94%
\$200 - Less than \$220	3	6%	100%

Question 2

c)

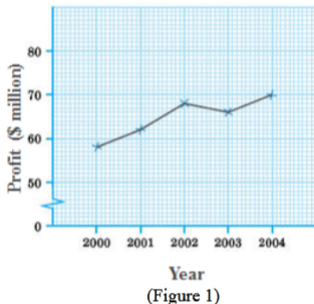


Question 3

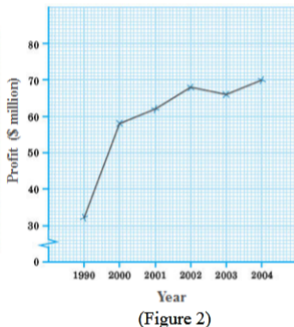
Q3

Figure 1 below shows the profits of ABC company from 2000 to 2004. To show the company's profit from 1990-2004 to shareholders, the managing director added the profit of the company in 1990 to the graph (Figure 2).

Profit of ABC company from
2000 to 2004



Profit of ABC company from
1990 to 2004



Do you think that the managing director is misleading the shareholders? Justify your answer.

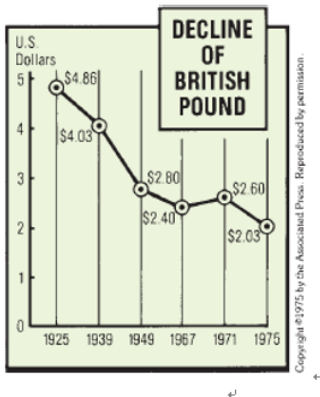
Question 3

Yes, the managing director is misleading the shareholders in Figure 2 because the profits in 1991 to 1999 are not shown. It gives the shareholder an impression that the company's profit increases rapidly from 1990 to 2000.

Question 4

Q4.1

The graph below appeared in the Lexington Herald-Leader newspaper on 5th October, 1975. Discuss the correctness of this graph.



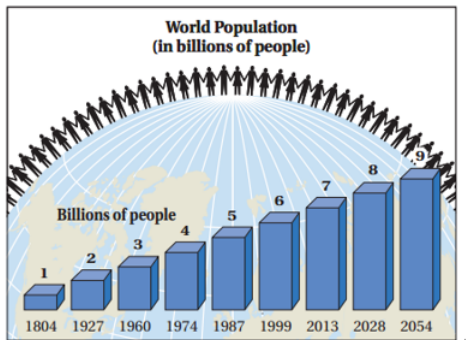
Question 4

The intervals of each two consecutive years are not equal. The bin widths range from 4 years to 18 years. It gives an impression that the British pound declined steadily from year 1971- 1975 compared with year 1939-1949. The title is too subjective. The measurement unit is not clearly stated.

Question 5

Q5

The following graph shows the world population from 1804-2054 (numbers for future years are based on United Nations projections). Critique the graph in terms of its layout, content and clarity.



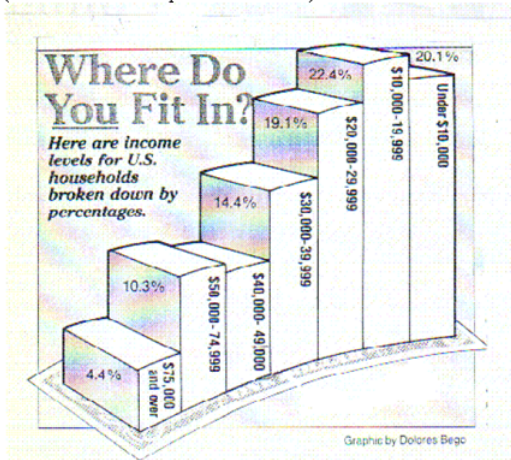
Question 5

The figures of people lining the globe do not give any information about world population. And it may give the impression that future world population will be declining. In the chart, it appears that world population has been raising linearly. Notice that the time intervals on the horizontal axis are not uniform in size. You should expect to have the graph showing slow increase in world population at the beginning years and exponential increase after year 1960.

Question 6

Q6

The following graph shows the U.S. household income data in 1985.
(Source: The U.S. Department of Labor)



Critique the graph in terms of its layout, content and clarity.

Question 6

The 3-D display makes it difficult to read the bars. Focusing at the front of each bar, the side of each bar, or the back of each bar will give different impressions. The x-axis goes from right to left, instead of the usual direction left to right, thereby giving a misleading perception of the asymmetry. Moreover, the curved and sloped x-axis exaggerates the difference between lower-income bars and upper-income bars. Percentage figure was missed from the bar of \$40,000-\$49,000. Moreover, the upper boundary of this bar should be \$49,999. The bar widths are not proportional to the interval ranges. For example, it goes by \$10,000 then by \$25,000, increasing the height of the \$50,000-\$74,999 bar. Total number of households was not given.