

CHAPTER 2: ORGANIZING AND VISUALIZING VARIABLES

SCENARIO 2-1

An insurance company evaluates many numerical variables about a person before deciding on an appropriate rate for automobile insurance. A representative from a local insurance agency selected a random sample of insured drivers and recorded, X , the number of claims each made in the last 3 years, with the following results.

X	f
1	14
2	18
3	12
4	5
5	1

1. Referring to Scenario 2-1, how many drivers are represented in the sample?
 - a) 5
 - b) 15
 - c) 18
 - d) 50

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: frequency distribution

2. Referring to Scenario 2-1, how many total claims are represented in the sample?
 - a) 15
 - b) 50
 - c) 111
 - d) 250

ANSWER:

c

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: interpretation, frequency distribution

3. A type of vertical bar chart in which the categories are plotted in the descending rank order of the magnitude of their frequencies is called a
 - a) contingency table.
 - b) Pareto chart.
 - c) stem-and-leaf display.
 - d) pie chart.

ANSWER:

b

TYPE: MC DIFFICULTY: Easy

KEYWORDS: Pareto chart

2-2 Organizing and Visualizing Variables

SCENARIO 2-2

At a meeting of information systems officers for regional offices of a national company, a survey was taken to determine the number of employees the officers supervise in the operation of their departments, where X is the number of employees overseen by each information systems officer.

X	f
1	7
2	5
3	11
4	8
5	9

4. Referring to Scenario 2-2, how many regional offices are represented in the survey results?
- a) 5
 - b) 11
 - c) 15
 - d) 40

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: interpretation, frequency distribution

5. Referring to Scenario 2-2, across all of the regional offices, how many total employees were supervised by those surveyed?
- a) 15
 - b) 40
 - c) 127
 - d) 200

ANSWER:

c

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: interpretation, frequency distribution

6. The width of each bar in a histogram corresponds to the
- a) differences between the boundaries of the class.
 - b) number of observations in each class.
 - c) midpoint of each class.
 - d) percentage of observations in each class.

ANSWER:

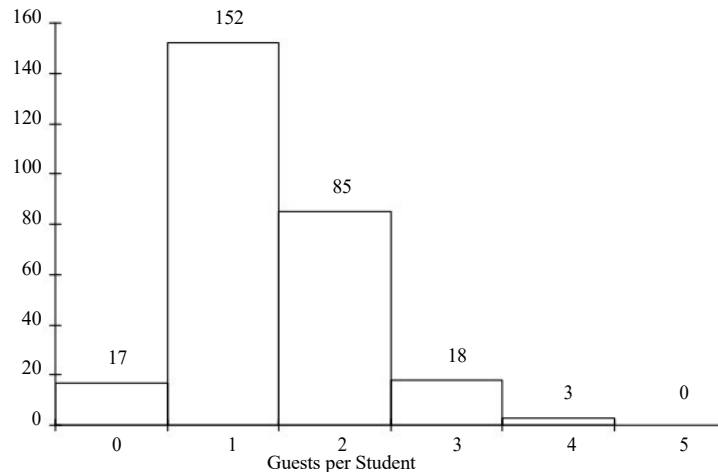
a

TYPE: MC DIFFICULTY: Easy

KEYWORDS: histogram

SCENARIO 2-3

Every spring semester, the School of Business coordinates a luncheon with local business leaders for graduating seniors, their families, and friends. Corporate sponsorship pays for the lunches of each of the seniors, but students have to purchase tickets to cover the cost of lunches served to guests they bring with them. The following histogram represents the attendance at the senior luncheon, where X is the number of guests each graduating senior invited to the luncheon and f is the number of graduating seniors in each category.



7. Referring to the histogram from Scenario 2-3, how many graduating seniors attended the luncheon?
- 4
 - 152
 - 275
 - 388

ANSWER:

c

TYPE: MC DIFFICULTY: Difficult

EXPLANATION: The number of graduating seniors is the sum of all the frequencies, f .

KEYWORDS: interpretation, histogram

8. Referring to the histogram from Scenario 2-3, if all the tickets purchased were used, how many guests attended the luncheon?
- 4
 - 152
 - 275
 - 388

ANSWER:

d

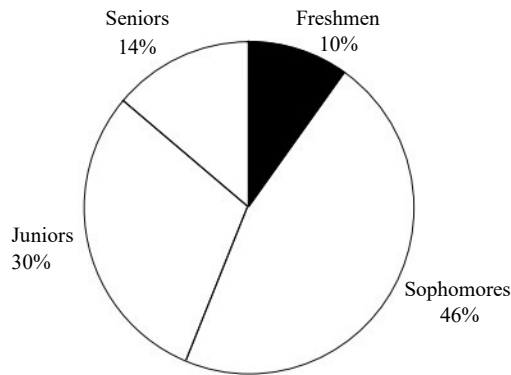
TYPE: MC DIFFICULTY: Difficult

EXPLANATION: The total number of guests is $\sum_{i=1}^6 X_i$ if

KEYWORDS: interpretation, histogram

2-4 Organizing and Visualizing Variables

9. A professor of economics at a small Texas university wanted to determine what year in school students were taking his tough economics course. Shown below is a pie chart of the results. What percentage of the class took the course prior to reaching their senior year?



- a) 14%
- b) 44%
- c) 54%
- d) 86%

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: interpretation, pie chart

10. When polygons or histograms are constructed, which axis must show the true zero or "origin"?
- a) The horizontal axis.
 - b) The vertical axis.
 - c) Both the horizontal and vertical axes.
 - d) Neither the horizontal nor the vertical axis.

ANSWER:

b

TYPE: MC DIFFICULTY: Easy

KEYWORDS: polygon, histogram

11. When constructing charts, the following is plotted at the class midpoints:
- a) frequency histograms.
 - b) percentage polygons.
 - c) cumulative percentage polygon (ogives).
 - d) All of the above.

ANSWER:

b

TYPE: MC DIFFICULTY: Easy

KEYWORDS: percentage polygon

SCENARIO 2-4

A survey was conducted to determine how people rated the quality of programming available on television. Respondents were asked to rate the overall quality from 0 (no quality at all) to 100 (extremely good quality). The stem-and-leaf display of the data is shown below.

Stem	Leaves
3	24
4	03478999
5	0112345
6	12566
7	01
8	
9	2

12. Referring to Scenario 2-4, what percentage of the respondents rated overall television quality with a rating of 80 or above?

- a) 0
- b) 4
- c) 96
- d) 100

ANSWER:

b

TYPE: MC DIFFICULTY: Easy

KEYWORDS: stem-and-leaf display, interpretation

13. Referring to Scenario 2-4, what percentage of the respondents rated overall television quality with a rating of 50 or below?

- a) 11
- b) 40
- c) 44
- d) 56

ANSWER:

c

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: stem-and-leaf display, interpretation

14. Referring to Scenario 2-4, what percentage of the respondents rated overall television quality with a rating from 50 through 75?

- a) 11
- b) 40
- c) 44
- d) 56

ANSWER:

d

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: stem-and-leaf display, interpretation

2-6 Organizing and Visualizing Variables

SCENARIO 2-5

The following are the duration in minutes of a sample of long-distance phone calls made within the continental United States reported by one long-distance carrier.

<u>Time (in Minutes)</u>	<u>Relative Frequency</u>
0 but less than 5	0.37
5 but less than 10	0.22
10 but less than 15	0.15
15 but less than 20	0.10
20 but less than 25	0.07
25 but less than 30	0.07
30 or more	0.02

15. Referring to Scenario 2-5, what is the width of each class?

- a) 1 minute
- b) 5 minutes
- c) 2%
- d) 100%

ANSWER:

b

TYPE: MC DIFFICULTY: Easy

KEYWORDS: class interval, relative frequency distribution

16. Referring to Scenario 2-5, if 1,000 calls were randomly sampled, how many calls lasted under 10 minutes?

- a. 220
- b. 370
- c. 410
- d. 590

ANSWER:

d

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: relative frequency distribution, interpretation

17. Referring to Scenario 2-5, if 100 calls were randomly sampled, how many calls lasted 15 minutes or longer?

- a. 10
- b. 14
- c. 26
- d. 74

ANSWER:

c

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: relative frequency distribution, interpretation

18. Referring to Scenario 2-5, if 10 calls lasted 30 minutes or more, how many calls lasted less than 5 minutes?
- a) 10
 - b) 185
 - c) 295
 - d) 500

ANSWER:

b

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: relative frequency distribution, interpretation

19. Referring to Scenario 2-5, what is the cumulative relative frequency for the percentage of calls that lasted under 20 minutes?
- a) 0.10
 - b) 0.59
 - c) 0.76
 - d) 0.84

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: cumulative relative frequency

20. Referring to Scenario 2-5, what is the cumulative relative frequency for the percentage of calls that lasted 10 minutes or more?
- a) 0.16
 - b) 0.24
 - c) 0.41
 - d) 0.90

ANSWER:

c

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: cumulative relative frequency

21. Referring to Scenario 2-5, if 100 calls were randomly sampled, _____ of them would have lasted at least 15 minutes but less than 20 minutes
- a) 6
 - b) 8
 - c) 10
 - d) 16

ANSWER:

c

TYPE: MC DIFFICULTY: Easy

KEYWORDS: relative frequency distribution, interpretation

2-8 Organizing and Visualizing Variables

22. Referring to Scenario 2-5, if 100 calls were sampled, _____ of them would have lasted less than 15 minutes.
- a) 26
 - b) 74
 - c) 10
 - d) None of the above.

ANSWER:

b

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: relative frequency distribution, interpretation

23. Referring to Scenario 2-5, if 100 calls were sampled, _____ of them would have lasted 20 minutes or more.
- a) 26
 - b) 16
 - c) 74
 - d) None of the above.

ANSWER:

b

TYPE: MC DIFFICULTY: Moderate

KEYWORDS: relative frequency distribution, interpretation

24. Referring to Scenario 2-5, if 100 calls were sampled, _____ of them would have lasted less than 5 minutes or at least 30 minutes or more.
- a) 35
 - b) 37
 - c) 39
 - d) None of the above.

ANSWER:

c

TYPE: MC DIFFICULTY: Difficult

KEYWORDS: relative frequency distribution, interpretation

25. Which of the following is appropriate for displaying data collected on the different brands of cars students at a major university drive?
- a) A Pareto chart
 - b) A two-way classification table
 - c) A histogram
 - d) A scatter plot

ANSWER:

a

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, Pareto diagram

26. One of the developing countries is experiencing a baby boom, with the number of births rising for the fifth year in a row, according to a BBC News report. Which of the following is best for displaying this data?
- a) A Pareto chart
 - b) A two-way classification table
 - c) A histogram
 - d) A time-series plot

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, time-series plot

27. When studying the simultaneous responses to two categorical questions, you should set up a
- a) contingency table.
 - b) frequency distribution table.
 - c) cumulative percentage distribution table.
 - d) histogram.

ANSWER:

a

TYPE: MC DIFFICULTY: Easy

KEYWORDS: contingency table

28. Data on 1,500 students' height were collected at a larger university in the East Coast. Which of the following is the best chart for presenting the information?
- a) A pie chart.
 - b) A Pareto chart.
 - c) A side-by-side bar chart.
 - d) A histogram.

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, histogram

29. Data on the number of part-time hours students at a public university worked in a week were collected. Which of the following is the best chart for presenting the information?
- a) A pie chart.
 - b) A Pareto chart.
 - c) A percentage table.
 - d) A percentage polygon.

ANSWER:

d

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, percentage polygon

30. Data on the number of credit hours of 20,000 students at a public university enrolled in a Spring semester were collected. Which of the following is the best for presenting the information?
- a) A pie chart.
 - b) A Pareto chart.
 - c) A stem-and-leaf display.
 - d) A contingency table.

ANSWER:

c

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, stem-and-leaf

31. A survey of 150 executives were asked what they think is the most common mistake candidates make during job interviews. Six different mistakes were given. Which of the following is the best for presenting the information?
- a) A bar chart.
 - b) A histogram
 - c) A stem-and-leaf display.
 - d) A contingency table.

ANSWER:

a

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, bar chart

32. You have collected information on the market share of 5 different search engines used by U.S. Internet users in a particular quarter. Which of the following is the best for presenting the information?
- a) A pie chart.
 - b) A histogram
 - c) A stem-and-leaf display.
 - d) A contingency table.

ANSWER:

a

TYPE: MC DIFFICULTY: Easy

KEYWORDS: choice of chart, pie chart