Business Analytics and Statistics 1st edition Black Test Bank

SKU: 9780730363330-TEST-BANK

Testbank

to accompany

Business analytics and statistics

1st edition

by
Black et al.

WILEY

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Chapter 2
Data visualisation

True/False Questions

1. Data grouped into intervals with the number of items in each group listed is called a frequency distribution.

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Easy

2. The width of a class interval in a frequency distribution will be approximately equal to the range divided by the midpoint of the middle class.

a. True
*b. False

General Feedback:
Section 2.1, Difficulty: Medium

3. A rule that must always be followed in constructing frequency distributions is that each data point can only fall into one class.

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Easy

4. The midpoint of the class interval (10, 12] is 11.

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Easy

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5. The midpoint of the class interval (6, 9] is 3.

a. True
*b. False

General Feedback:
Section 2.1, Difficulty: Easy

6. The range of data in the following frequency distribution is 10.

Class interval	Frequency
(10, 20]	15
(20, 30]	25
(30, 40]	10

a. True
*b. False

General Feedback:
Section 2.1, Difficulty: Easy

7. A financial analyst has randomly selected 200 companies from those traded on the Australian Securities Exchange. At the end of each trading day, the analyst records the closing price for each of the 200 companies. These 200 measurements are an example of grouped data.

a. True
*b. False

General Feedback:
Section 2.1, Difficulty: Easy

8. If the individual class frequency is divided by the total frequency, the result is the relative frequency.

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Medium

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9. A researcher has decided to construct a frequency distribution for a set of data containing 60 numbers. The lowest number is 23 and the highest number is 68. If 7 classes are used, the class width should be approximately 7.

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Easy

10. The cumulative frequency for a class is 27. The cumulative frequency for the next (non-empty) class will be greater than 27.

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Easy

11. In the following relative frequency distribution given below, if there were 60 numbers in the data set, 20 numbers were in the interval (20, 40].

Class interval	Relative frequency
(20, 40]	0.2
(40, 60]	0.3
(60, 80]	0.4
(80, 100]	0.1

a. True
*b. False

General Feedback:
Section 2.1, Difficulty: Easy

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12. In the following if there were 60 numbers in the data set, there would be 54 numbers under 80.

Class interval	Relative frequency
(20, 40]	0.2
(40, 60]	0.3
(60, 80]	0.4
(80, 100]	0.1

*a. True
b. False

General Feedback:
Section 2.1, Difficulty: Easy

13. A cumulative frequency polygon is also called an ogive.

*a. True
b. False

General Feedback:
Section 2.2, Difficulty: Easy

14. An instructor has decided to graphically represent the grades on a test. The instructor uses a plus/minus grading system (i.e. she gives grades of A–, B+ etc.). A stem-and-leaf plot would provide the most information for the students.

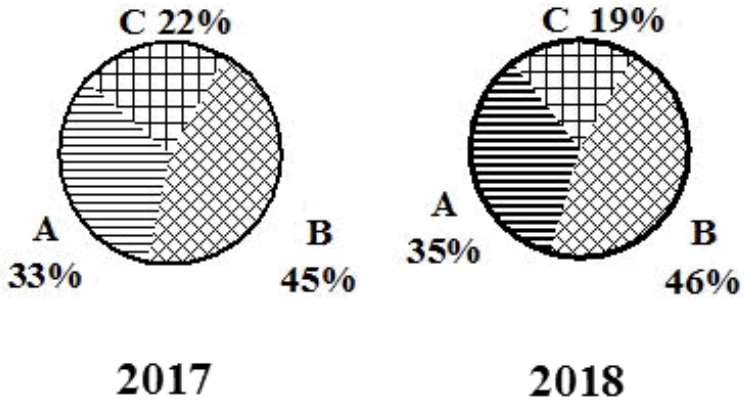
*a. True
b. False

General Feedback:
Section 2.2, Difficulty: Medium

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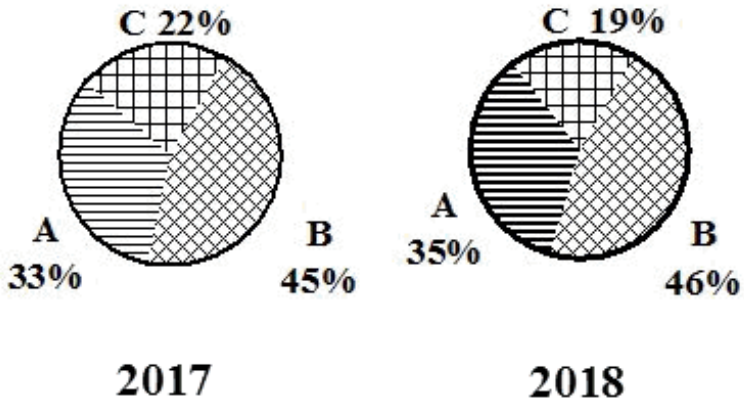
15. The 2017 and 2018 market share data of the three competitors (A, B and C) in an oligopolistic industry are presented in the following pie charts. Total sales for this industry were $1.5 billion in 2017 and $1.8 billion in 2018. Company C's sales in 2018 were $342 million.



*a. True
b. False

General Feedback:
Section 2.2, Difficulty: Easy

16. The 2017 and 2018 market share data of the three competitors (A, B and C) in an oligopolistic industry are presented in the following pie charts. From these charts, we can deduce that sales revenues declined at company C.



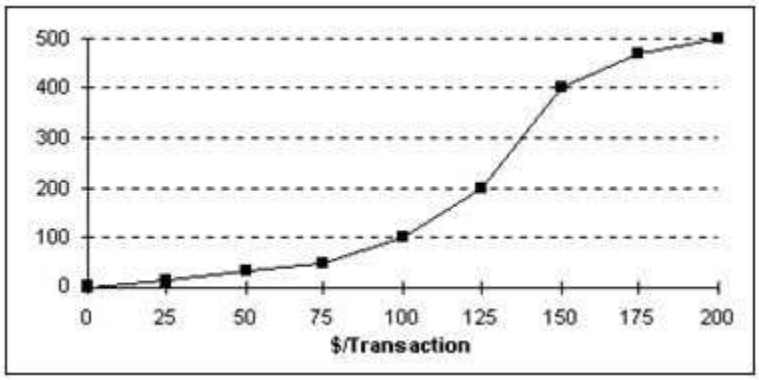
a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Medium

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17. Each day, the manager of Olinda's Corner Shop prepares a frequency distribution and an ogive of sales transactions by dollar value of the transactions. Saturday's cumulative frequency ogive follows.



The percentage of sales transactions on Saturday that were under $100 each was 100%.

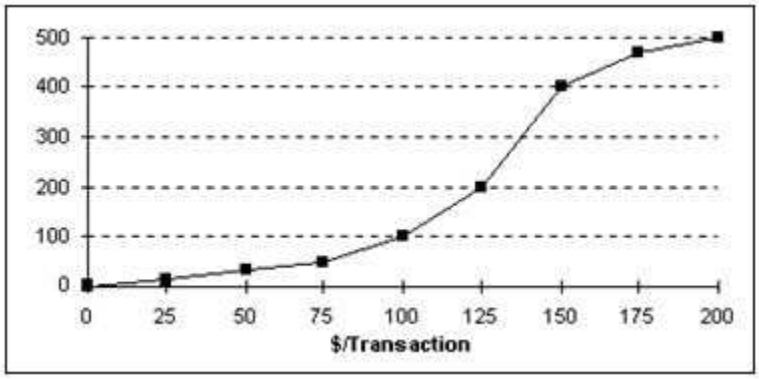
a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Medium

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18. Each day, the manager of Olinda's Corner Shop prepares a frequency distribution and an ogive of sales transactions by dollar value of the transactions. Saturday's cumulative frequency ogive follows.

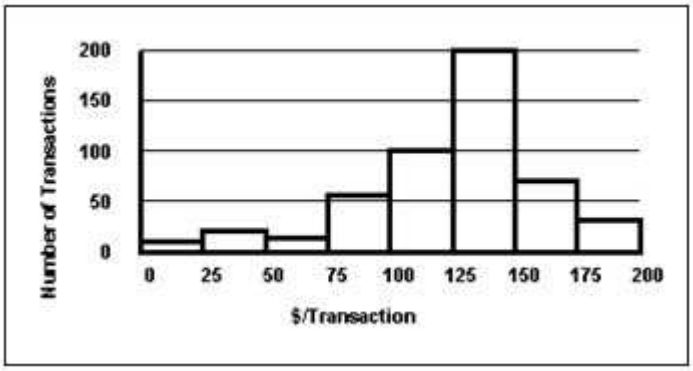


The percentage of sales transactions on Saturday that were between $100 and $150 was 60%.

*a. True
b. False

General Feedback:
Section 2.2, Difficulty: Medium

19. Each day, the manager of Olinda's Corner Shop prepares a frequency distribution and a histogram of sales transactions by dollar value of the transactions. Friday's histogram follows.



On Tuesday, the approximate number of sales transactions between $100 and $150 was 200.

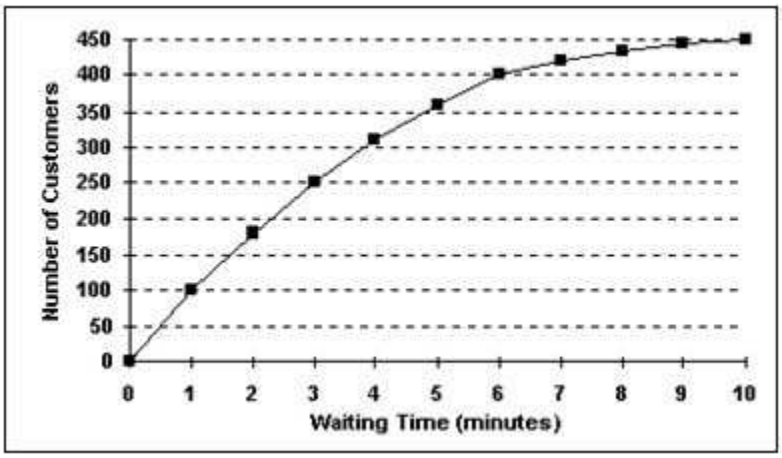
a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Easy

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20. The staff of Tom Wilson, Operations Manager at Port Pirie Building Society, prepared a cumulative frequency ogive of waiting time for walk-in customers.



The percentage of walk-in customers waiting one minute or less was 11%.

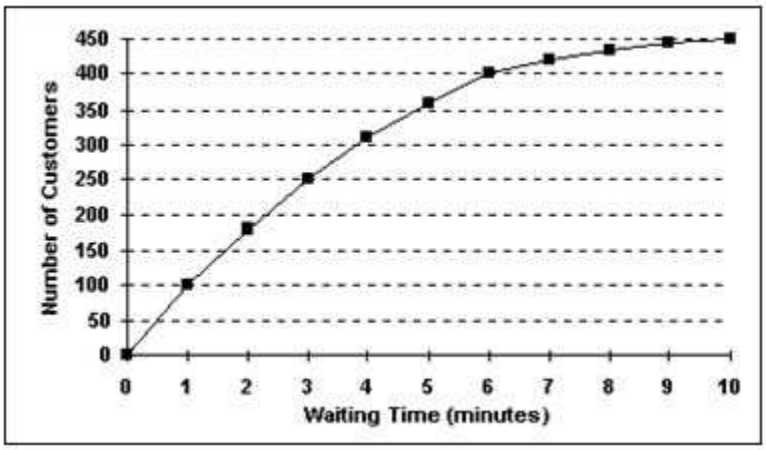
a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Easy

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21. The staff of Tom Wilson, Operations Manager at Port Pirie Building Society, prepared a cumulative frequency ogive of waiting time for walk-in customers.



The percentage of walk-in customers waiting between 1 and 6 minutes was 67%.

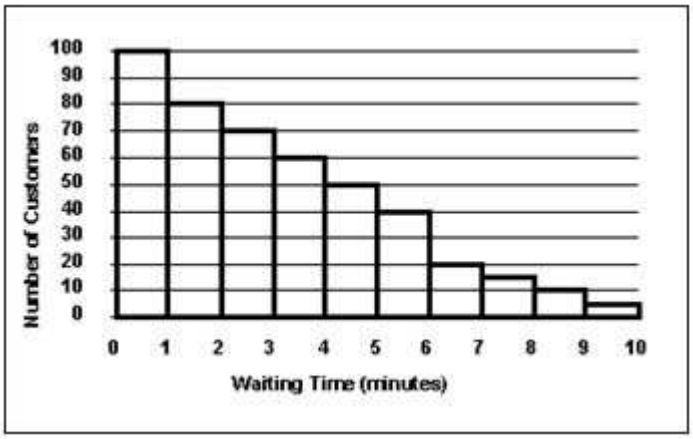
*a. True
b. False

General Feedback:
Section 2.2, Difficulty: Easy

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22. The staff of Tom Wilson, Operations Manager at Port Pirie Building Society, prepared a frequency histogram of waiting time for walk-in customers.



Approximately 100 walk-in customers waited at least 7 minutes.

a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Easy

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23. The staff of Tamara Hill, Technical Analyst with Blue Mountain Brokers, prepared a cumulative percentage ogive of market capitalisation of corporations listed on the Australian Securities Exchange.



The percentage of corporations with capitalisation of $50 000 000 or less was 26.

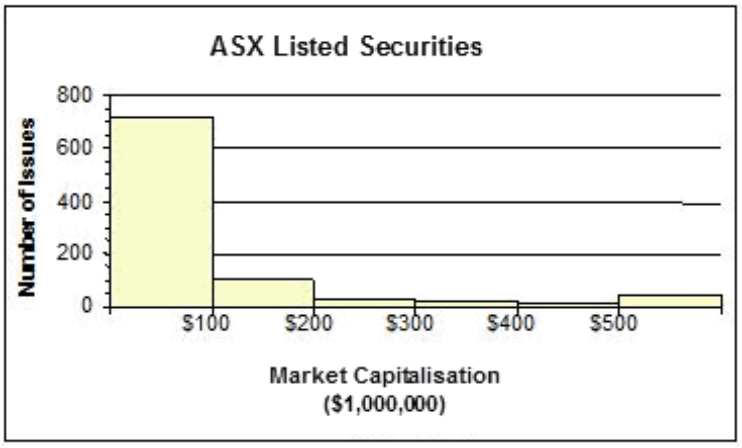
a. True
*b. False

General Feedback:
Section 2.2

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24. The staff of Tamara Hill, Technical Analyst with Blue Mountain Brokers, prepared a frequency histogram of market capitalisation of the corporations listed on the Australian Securities Exchange.



Approximately 100 corporations had capitalisation exceeding $200 000 000.

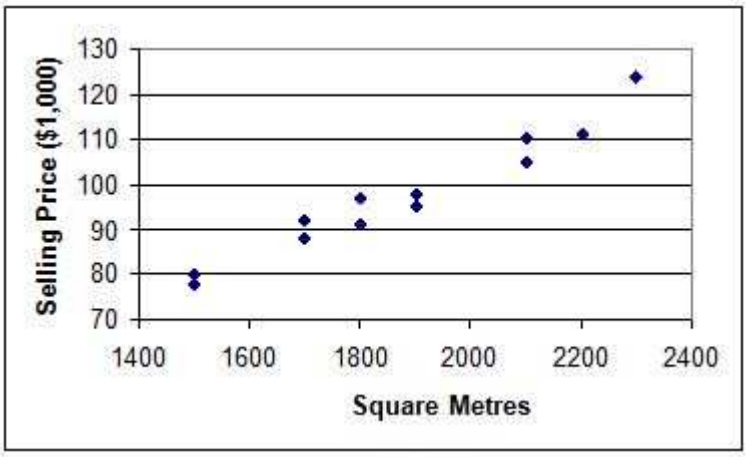
*a. True
b. False

General Feedback:
Section 2.2, Difficulty: Easy

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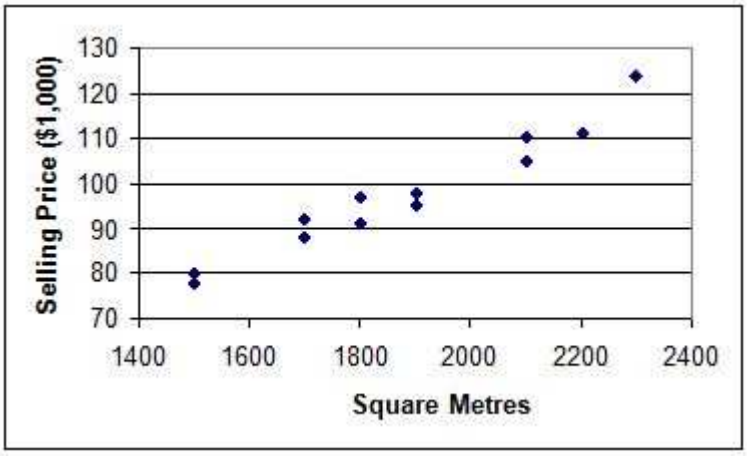
25. The following graphic of residential housing data (selling price and size in square metres) is a cumulative histogram.



a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Easy

26. The following graphic of residential housing data indicates an inverse relationship between the two variables.



a. True
*b. False

General Feedback:
Section 2.2, Difficulty: Easy

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27. ‘Multivariate’ refers to data relating to multiple variables.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Easy

28. ‘Chart junk’ refers to the inclusion of incorrect data on a chart.

a. True
*b. False

General Feedback:
Section 2.3, Difficulty: Easy

29. Multidimensional visualisation of temporal data is best achieved through the use of different coloured markers.

a. True
*b. False

General Feedback:
Section 2.3, Difficulty: Easy

30. Multidimensional visualisation of categorical data is best achieved through the use of different coloured or sized markers.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Easy

31. Using colour-coding on a scatterplot allows visualisation of the categorical outcome of two plotted variables.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Medium

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32. An interaction term should be created when two variables act together to affect a third variable.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Medium

33. Visualisations that use multiple panels use a separate plot of the same type for each categorical variable.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Easy

34. A scatterplot matrix uses different coloured markers to display all possible pairwise combinations of variables.

a. True
*b. False

General Feedback:
Section 2.3, Difficulty: Easy

35. A trendline is drawn over individual plotted points to help us see patterns in the data.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Easy

36. Bubble plots are useful to highlight data in scatterplots that include aggregations.

a. True
*b. False

General Feedback:
Section 2.3, Difficulty: Medium

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37. Animations are a particularly powerful way to display temporal data.

*a. True
b. False

General Feedback:
Section 2.3, Difficulty: Easy

38. An interactive visualisation has multiple linked displays so that operations performed on one display will automatically be reflected in the other displays.

*a. True
b. False

General Feedback:
Section 2.4, Difficulty: Easy

39. Panning refers to zooming in on a subset of a large dataset.

a. True
*b. False

General Feedback:
Section 2.4, Difficulty: Easy

40. Excel is an example of powerful data visualisation software.

a. True
*b. False

General Feedback:
Section 2.4, Difficulty: Easy

41. Static visualisations are usually more effective than interactive visualisations at communicating patterns within multivariate data.

a. True
*b. False

General Feedback:
Section 2.4, Difficulty: Easy

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42. To determine short-term and long-term patterns in temporal data, the data must be aggregated in different ways (e.g. hourly, daily and weekly).

*a. True
b. False

General Feedback:
Section 2.4, Difficulty: Easy

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Multiple Choice Questions

43. A rule that must always be followed in constructing frequency distributions is that _____.

*a. adjacent classes must not overlap
b. the midpoint of each class must be a whole number
c. the width of each class is equal to the range
d. the number of intervals must be an odd number

General Feedback:
Section 2.1, Difficulty: Easy

44. A cumulative frequency distribution would provide _____.

a. a graph of a frequency distribution
*b. a running total of the frequencies in the classes
c. the proportion of the total frequencies which fall into each class
d. a very cloudy picture of the frequencies

General Feedback:
Section 2.1, Difficulty: Easy

45. What is the midpoint of the class interval (20, 25]?

a. 47
b. 20
*c. 22.5
d. 23

General Feedback:
Section 2.1, Difficulty: Easy

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46. Consider the following frequency distribution:

Class interval	Frequency
(10, 20]	15
(20, 30]	25
(30, 40]	10

What is the midpoint of the first class?

a. 10
b. 20
*c. 15
d. None of the above.

47. Consider the following frequency distribution:

Class interval	Frequency
(10, 20]	15
(20, 30]	25
(30, 40]	10

What is the cumulative frequency of the second-class interval?

a. 25
*b. 40
c. 15
d. 50

General Feedback:
Section 2.1, Difficulty: Easy

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48. The number of phone calls arriving at a switchboard each hour has been recorded and the following frequency distribution has been developed.

Class interval	Frequency
(20, 40]	30
(40, 60]	45
(60, 80]	80
(80, 100]	45

What is the midpoint of the last class?

a. 80
b. 100
c. 95
*d. 90

General Feedback:
Section 2.1, Difficulty: Easy

49. The number of phone calls arriving at a switchboard each hour has been recorded and the following frequency distribution has been developed.

What is the cumulative frequency of the third class?

Class interval	Frequency
(20, 40]	30
(40, 60]	45
(60, 80]	80
(80, 100]	45

a. 80
b. 0.40
*c. 155
d. 75

General Feedback:
Section 2.1, Difficulty: Easy

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50. A researcher has decided to construct a frequency distribution for a set of data containing 60 numbers. The lowest number is 23 and the highest number is 68. If 5 classes are used, the class width should be approximately _____.

a. 4
b. 12
*c. 9
d. 5

General Feedback:
Section 2.1, Difficulty: Easy

51. A frequency distribution was developed. The lower endpoint of the first class is 9.30, and the midpoint is 9.35. What is the upper endpoint of this class?

a. 9.50
b. 9.60
c. 9.70
*d. 9.40

General Feedback:
Section 2.1, Difficulty: Easy

52. The following class intervals for a frequency distribution were developed to provide information regarding the starting salaries for students graduating from a particular school:

Salary ($1000s)	Number of graduates
(18, 21]	–
(21, 25]	–
(24, 27]	–
(29, 30]	–

Before data was collected, someone questioned the validity of this arrangement. Which of the following represents a problem with this set of intervals?

a. There are too many intervals.
b. The class widths are too small.
*c. Some numbers between 18 000 and 30 000 would not fall into any of these intervals.
d. The first and the second interval overlap.

General Feedback:
Section 2.1, Difficulty: Medium

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53. Adam Shapiro, Director of Human Resources, is exploring employee absenteeism at Harrison Haulage during the last operating year. A review of all personnel records indicated that absences ranged from 0 to 29 days per employee. The following class intervals were proposed for a frequency distribution of absences.

Which of the following represents a problem with this set of intervals?

Absences (days)	Number of employees
(0, 5]	–
(5, 10]	–
(10, 15]	–
(15, 20]	–
(20, 25]	–
(25, 30]	–

a. There are too few intervals.
b. Some numbers between 0 and 29 would not fall into any interval.
c. The first and second interval overlap.
*d. None of the above. (These intervals are okay.)

General Feedback:
Section 2.1, Difficulty: Medium

54. Adam Shapiro, Director of Human Resources, is exploring employee absenteeism at Harrison Haulage during the last operating year. A review of all personnel records indicated that absences ranged from 0 to 29 days per employee. The following class intervals were proposed for a frequency distribution of absences.

Which of the following represents a problem with this set of intervals?

Absences (days)	Number of employees
(0, 10]	–
(10, 20]	–
(20, 30]	–

*a. There are too few intervals.
b. Some numbers between 0 and 29 would not fall into any interval.
c. The first and second interval overlap.
d. There are too many intervals.

General Feedback:
Section 2.1, Difficulty: Easy

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55. Consider the relative frequency distribution given below:

Class interval	Relative frequency
(20, 40]	0.2
(40, 60]	0.3
(60, 80]	0.4
(80, 100]	0.1

There were 60 numbers in the data set. How many numbers were in the interval (40, 60]?

a. 30
b. 50
*c. 18
d. 12

General Feedback:
Section 2.1, Difficulty: Easy

56. Consider the following frequency distribution:

Class interval	Frequency
(100, 200]	25
(200, 300]	45
(300, 400]	30

What is the midpoint of the first class?

a. 100
*b. 150
c. 25
d. 250

General Feedback:
Section 2.1, Difficulty: Easy

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57. Consider the following frequency distribution:

Class interval	Frequency
(100, 200]	25
(200, 300]	45
(300, 400]	30

Class Interval	Frequency
100-under 200	25
200-under 300	45
300-under 400	30

What is the cumulative frequency of the second class interval?

a. 25
b. 45
*c. 70
d. 250

General Feedback:
Section 2.1, Difficulty: Easy

58. Jessica Salas, Managing Director of Salas Products, is reviewing the warranty policy for her company's new model of car batteries. Accelerated life tests were performed on a sample of 100 batteries and the following relative frequency distribution was compiled.

Battery life (months)	Relative frequency
(40, 50]	0.05
(50, 60]	0.10
(60, 70]	0.25
(70, 80]	0.50
(80, 100]	0.10

The number of batteries in (40, 50] interval was _____.

a. 45
*b. 5
c. 10
d. 15

General Feedback:
Section 2.1, Difficulty: Easy

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59. Jessica Salas, Managing Director of Salas Products, is reviewing the warranty policy for her company's new model of car batteries. Accelerated life tests were performed on a sample of 100 batteries and the following relative frequency distribution was compiled.

Battery life (months)	Relative frequency
(40, 50]	0.05
(50, 60]	0.10
(60, 70]	0.25
(70, 80]	0.50
(80, 100]	0.10

The number of batteries which lasted less than 60 months was _____.

Battery Life (months)	Relative Frequency
40-under 50	0.05
50-under 60	0.10
60-under 70	0.25
70-under 80	0.50
80-under 100	0.10

a. 10
b. 55
c. 5
*d. 15

General Feedback:
Section 2.1, Difficulty: Medium

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60. Isobel Robinson, Director of Quality Control, is concerned about the variability in a drilling process. The process should produce 1 cm holes in aluminium castings. A sample of 90 castings are drilled and inspected. Data collected from measuring the 90 holes were compiled to form the following frequency distribution.

Hole diameter (cm)	Number of holes
(0.85, 0.90]	10
(0.90, 0.95]	20
(0.95, 1.00]	30
(1.00, 1.05]	20
(1.05, 1.10]	10

The number of holes under 1 cm in diameter was _____.

a. 20
*b. 60
c. 25
d. 30

General Feedback:
Section 2.1, Difficulty: Medium

61. A graphical representation of a frequency distribution is called a _____.

a. stem-and-leaf plot
b. ogive
*c. histogram
d. pie chart

General Feedback:
Section 2.2, Difficulty: Easy

62. A histogram is a type of _____.

a. graphical depiction of an ogive
*b. vertical bar chart
c. vertical stem-and-leaf plot
d. three-dimensional pie chart

General Feedback:
Section 2.2, difficulty: easy

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63. One advantage of a stem-and-leaf plot over a frequency distribution is that _____.

a. it contains more class intervals
*b. the values of the original data are retained
c. the class midpoints are used as the stem
d. the class midpoints are used as the leaf

General Feedback:
Section 2.2, Difficulty: Easy

64. Consider the following stem-and-leaf plot:

Stem	Leaf
1	0 2 5 7
2	2 3 4 4
3	0 4 6 6 9
4	5 8 8 9
5	2 7 8

Suppose that a frequency distribution was developed from this, and there were 5 classes — (10, 20], (20, 30], etc. What would the frequency be for class (30, 40]?

a. 3
b. 4
*c. 5
d. 9

General Feedback:
Section 2.2, Difficulty: Medium

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65. Consider the following stem-and-leaf plot:

Stem	Leaf
1	0 2 5 7
2	2 3 4 4
3	0 4 6 6 9
4	5 8 8 9
5	2 7 8

Suppose that a frequency distribution was developed from this, and there were 5 classes — (10, 20], (20, 30] etc. What was the highest number in the data set?

*a. 50
b. 58
c. 59
d. 100

General Feedback:
Section 2.2, Difficulty: Medium

66. Consider the following stem-and-leaf plot:

Stem	Leaf
1	0 2 5 7
2	2 3 4 4
3	0 4 6 6 9
4	5 8 8 9
5	2 7 8

Suppose that a frequency distribution was developed from this, and there were 5 classes — (10, 20], (20, 30] etc. Most of the numbers in the (40, 50] class are _____.

a. close to 40
*b. close to 50
c. equal to 45
d. between 41 and 44

General Feedback:
Section 2.2, Difficulty: Medium

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67. Cumulative frequencies are usually represented graphically by _____.

a. histograms
b. pie charts
*c. ogives
d. frequency polygons

General Feedback:
Section 2.2, Difficulty: Easy

68. The following represent the ages of students in a class:
19, 23, 21, 19, 19, 20, 22, 31, 21, 20
If a stem-and-leaf plot were to be developed from this, how many stems would there be?

a. 2
*b. 3
c. 4
d. 10

General Feedback:
Section 2.2, Difficulty: Easy

69. Which of the following would be most helpful if you wished to construct a pie chart?

a. A frequency distribution
*b. A relative frequency distribution
c. A cumulative frequency distribution
d. An ogive

General Feedback:
Section 2.2, Difficulty: Medium

70. In a histogram, the highest bar represents the class with _____.

*a. the highest frequency
b. the lowest frequency
c. the highest cumulative frequency
d. the lowest relative frequency

General Feedback:
Section 2.2, Difficulty: Easy

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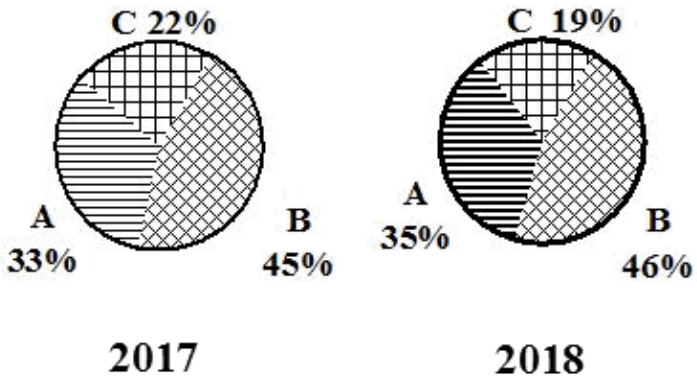
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71. The Australian computer market is very competitive. Given unit-shipment market shares were: Dell 13.4%, Compaq 15.0%, Gateway 8.2%, Hewlett-Packard 8.4%, IBM 8.9% and others 46.1%, what would be the best graphic depiction of these data?

a. A histogram
b. A frequency polygon
*c. A pie chart
d. An ogive

General Feedback:
Section 2.2, Difficulty: Easy

72. The 2017 and 2018 market share data of the three competitors (A, B and C) in an oligopolistic industry are presented in the following pie charts.



Which of the following is true?

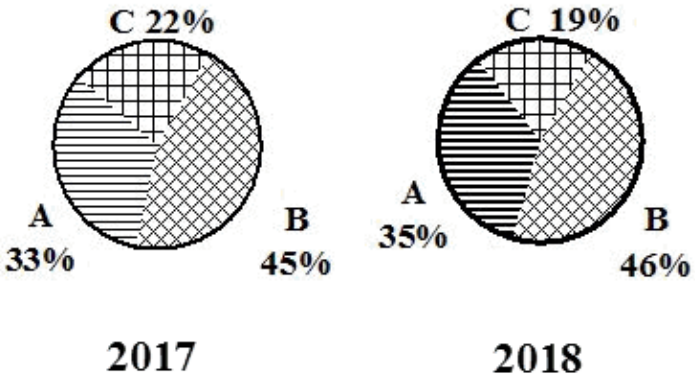
a. Only company b gained market share.
*b. Only company c lost market share.
c. Company a lost market share.
d. Company b lost market share.

General Feedback:
Section 2.2, Difficulty: Easy

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73. The 2017 and 2018 market share data of the three competitors (A, B and C) in an oligopolistic industry are presented in the following pie charts. Total sales for this industry were $1.5 billion in 2017 and $1.8 billion in 2018.



Company B's sales in 2017 were _____.

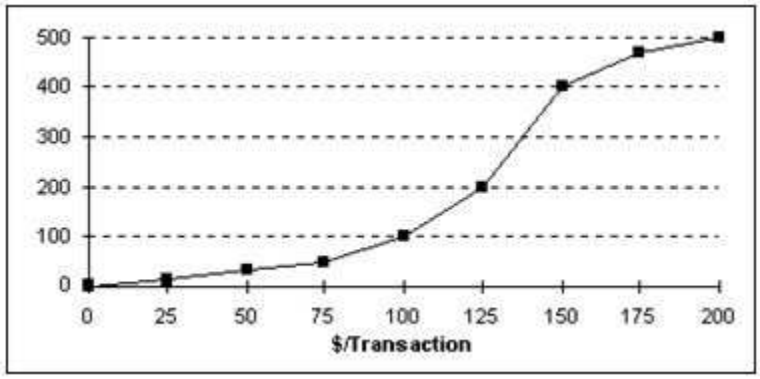
a. $342 million
b. $630 million
c. $675 million
*d. $828 million

General Feedback:
Section 2.2, Difficulty: Easy

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74. Each day, the manager of Olinda's Corner Shop prepares a frequency distribution and an ogive of sales transactions by dollar value of the transactions. Saturday's cumulative frequency ogive follows.



The total number of sales transactions on Saturday was _____.

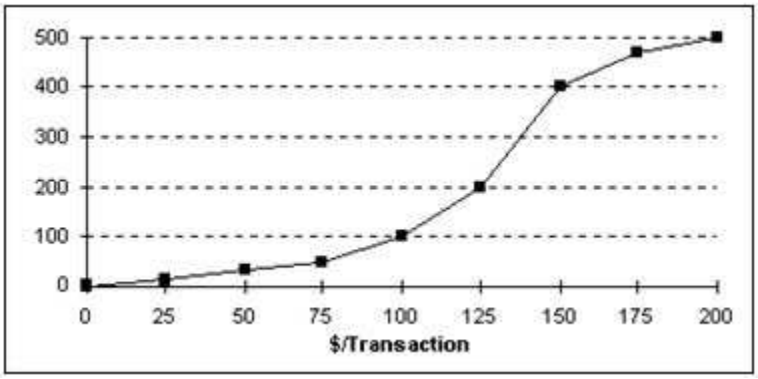
a. 200
*b. 500
c. 300
d. 100

General Feedback:
Section 2.2, Difficulty: Easy

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75. Each day, the manager of Olinda's Corner Shop prepares a frequency distribution and an ogive of sales transactions by dollar value of the transactions. Saturday's cumulative frequency ogive follows.



The percentage of sales transactions on Saturday that were at least $100 each was _____.

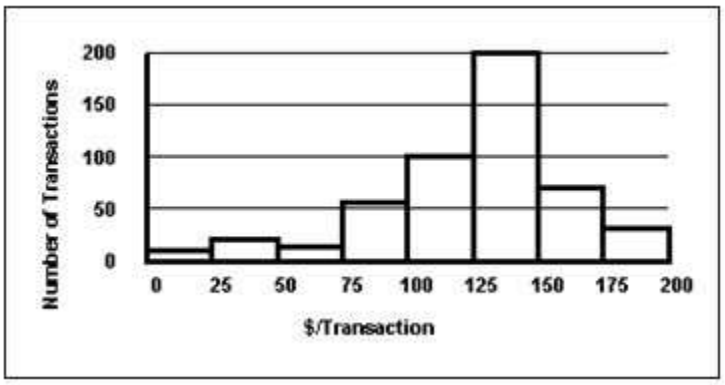
a. 100
b. 10
*c. 80
d. 20

General Feedback:
Section 2.2, Difficulty: Medium

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76. Each day, the manager of Olinda's Corner Shop prepares a frequency distribution and a histogram of sales transactions by dollar value of the transactions. Friday's histogram follows.



On Tuesday, the approximate number of sales transactions in the (125, 150] category was _____.

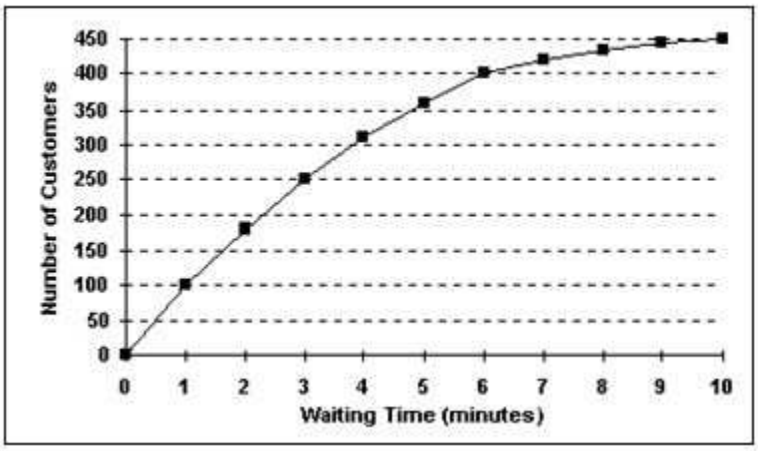
a. 50
b. 100
c. 150
*d. 200

General Feedback:
Section 2.2, Difficulty: Easy

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77. The staff of Tom Wilson, Operations Manager at Port Pirie Building Society, prepared a cumulative frequency ogive of waiting time for walk-in customers.



The total number of walk-in customers included in the study was _____.

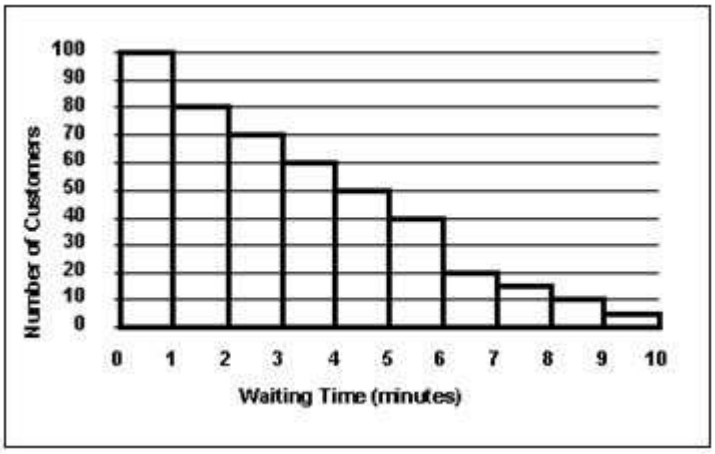
a. 100
b. 250
c. 300
*d. 450

General Feedback:
Section 2.2, Difficulty: Easy

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78. The staff of Tom Wilson, Operations Manager at Port Pirie Building Society, prepared a frequency histogram of waiting time for walk-in customers.



Approximately _____ walk-in customers waited less than 2 minutes.

a. 20
b. 30
c. 100
*d. 180

General Feedback:
Section 2.2, Difficulty: Easy

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79. The staff of Tamara Hill, Technical Analyst with Blue Mountain Brokers, prepared a cumulative percentage ogive of market capitalisation of the corporations listed on the Australian Securities Exchange.



The median market capitalisation of the corporations was _____.

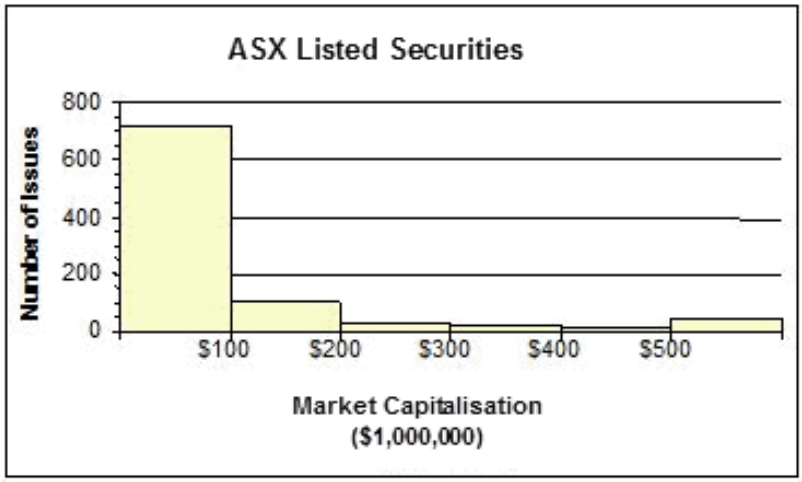
a. $200 000 000
*b. $26 000 000
c. $12 000 000
d. $60 000 000

General Feedback:
Section 2.2, Difficulty: Medium

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80. The staff of Tamara Hill, Technical Analyst with Blue Mountain Brokers, prepared a frequency histogram of market capitalisation of the corporations listed on the Australian Securities Exchange.



Approximately _____ corporations had capitalisations of $200 000 000 or less.

a. 50
b. 100
c. 700
*d. 800

General Feedback:
Section 2.2, Difficulty: Easy

81. The main weakness of basic charts and distribution plots is _____.

*a. they can only display one or two variables
b. they are difficult to prepare
c. they cannot be used for aggregated data
d. they require specialist software to prepare

General Feedback:
Section 2.3, Difficulty: Easy

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82. Chart junk refers to _____.

a. the overuse of visual reports
b. the use of incorrect data on a chart
*c. the use of design elements that hinder understanding
d. the use of more than two variables on a chart

General Feedback:
Section 2.3, Difficulty: Easy

83. In a multidimensional visualisation, categorical information can best be represented by _____.

*a. colour, shape and multiple panels
b. animation
c. intensity of colour
d. marker size

General Feedback:
Section 2.3, Difficulty: Easy

84. In a multidimensional visualisation, numerical information can best be represented by _____.

a. colour, shape and multiple panels
b. animation
*c. intensity of colour
d. panning

General Feedback:
Section 2.3, Difficulty: Easy

85. In a multidimensional visualisation, temporal information can best be represented by _____.

a. colour, shape and multiple panels
*b. animation
c. intensity of colour
d. marker size

General Feedback:
Section 2.3, Difficulty: Easy

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86. Introducing colour coding to a scatterplot enables visualisation of _____.

a. numerical data
b. two variables
c. an interaction term
*d. the effect of the two plotted variables on a categorical outcome

General Feedback:
Section 2.3, Difficulty: Medium

87. A term used to model the results when two variables work together to affect a third variable is called a/an _____.

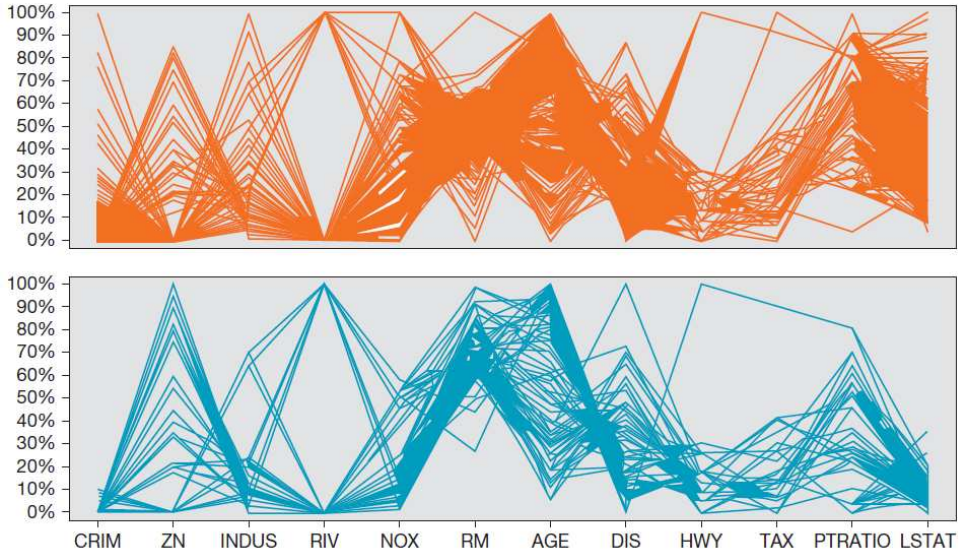
*a. interaction term
b. scatterplot matrix
c. categorical term
d. interactive parallel coordinates term

General Feedback:
Section 2.3, Difficulty: Medium

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88. The following plot is a _____.



a. scatterplot matrix
b. bubble plot
*c. parallel coordinates plot
d. zoomed in plot

General Feedback:
Section 2.3, Difficulty: Easy

89. An example of a variable transformation is _____.

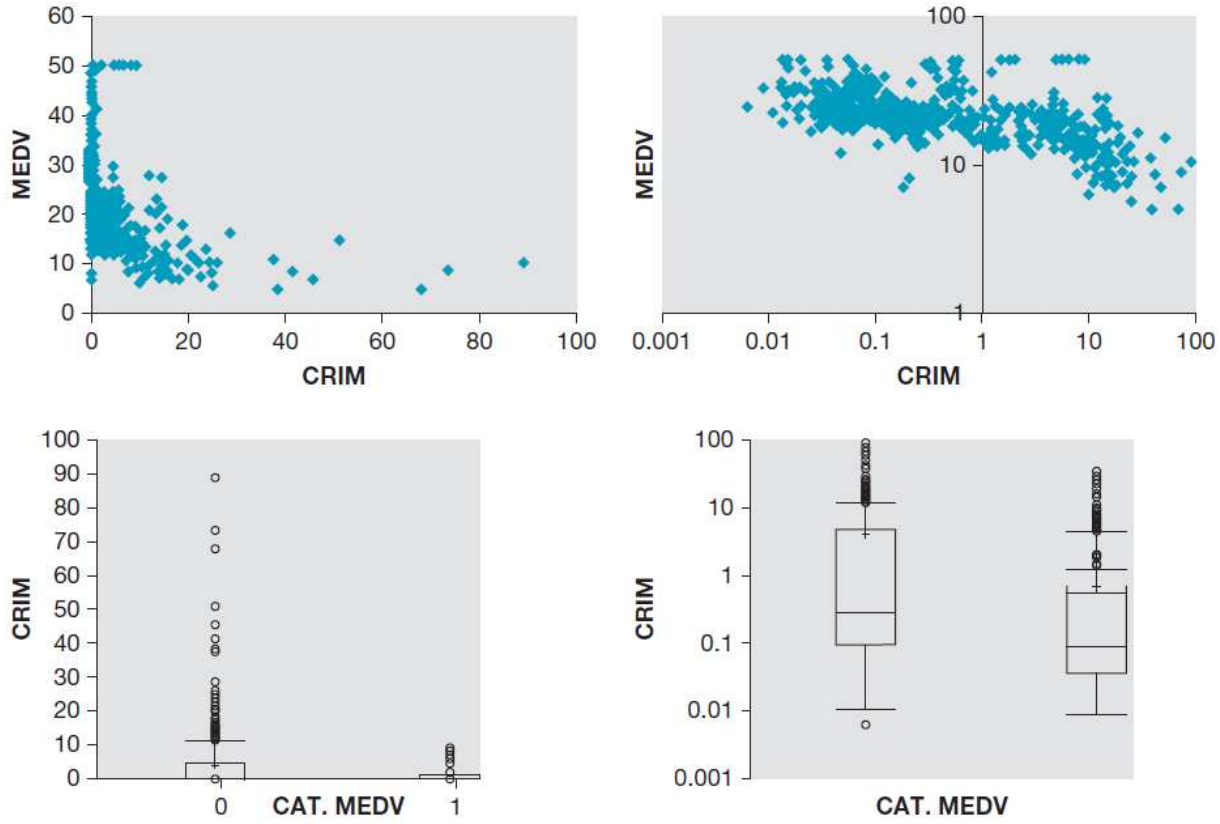
a. changing the numeric scale of a variable
b. binning numerical variables
c. condensing categories in categorical variables
*d. all of the above

General Feedback:
Section 2.3, Difficulty: Medium

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90. What transformation has taken place between the left and right plots in the diagram below?



*a. Rescaling
b. Panning
c. Zooming
d. Binning

General Feedback:
Section 2.3, Difficulty: Medium

91. The interface of an interactive visualisation allows _____.

a. easy, quick and reversible changes to a chart
b. linked visualisations so changes in one visualisation are automatically reflected in others
c. easy combination and display of concurrent charts and tables
*d. all of the above

General Feedback:
Section 2.4, Difficulty: Easy

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92. To experiment with bin size for a histogram, the best choice of software from the options below is _____.

a. Excel
*b. Spotfire
c. Python
d. R

General Feedback:
Section 2.4, Difficulty: Easy

93. Producing weekly, monthly, seasonal and annual data from daily data is known as _____.

a. exponential smoothing
b. panning
c. replotting
*d. aggregation

General Feedback:
Section 2.4, Difficulty: Easy

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Short Answer/Essay Questions

94. What is a frequency distribution?

Correct Answer:
Section 2.1. A frequency distribution is a summary of the data presented as non-overlapping class intervals covering the entire range of the data and their corresponding frequencies. Frequency distributions are a convenient way of grouping continuous data. Data that have been organised into a frequency distribution are called grouped data.

95. Describe the concept of cumulative frequency.

Correct Answer:
Section 2.1. The cumulative frequency is the running total of frequencies through the classes of a frequency distribution. The cumulative frequency of each class distribution is found by adding the frequency of that interval to the cumulative frequency of the previous class interval. The cumulative frequency of the first class interval is simply the frequency of that interval.

96. Describe the concept of relative frequency.

Correct Answer:
Section 2.1. Relative frequency is the ratio of the frequency of the class interval to the total frequency. This gives the proportion of the total data that lie in the class interval.

97. Consider the relative frequency distribution given below:

Class interval	Relative frequency
(20, 40]	0.2
(40, 60]	0.3
(60, 80]	0.4
(80, 100]	0.1

There were 60 numbers in the data set. How many numbers were in the interval (20, 40]?

Correct Answer:
Section 2.1. The answer is 12. This is calculated in the following way: $0.2 \times 60 = 12$

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98. Isobel Robinson, Director of Quality Control, is concerned about the variability in a drilling process. The process should produce 1 cm holes in aluminium castings. A sample of 90 castings are drilled and inspected. Data collected from measuring the 90 holes were compiled to form the following frequency distribution.

Hole diameter (cm)	Number of holes
(0.85, 0.90]	10
(0.90, 0.95]	20
(0.95, 1.00]	30
(1.00, 1.05]	20
(1.05, 1.10]	10

What is the midpoint of the third class interval?

Correct Answer:
Section 2.1. 25. This is calculated by: (30 – 20)/2 + 20 = 5 + 20 = 25

99. A frequency distribution was developed. The lower endpoint of the first class is 9.30, and the midpoint is 9.35. What is the upper endpoint of this class?

Correct Answer:
Section 2.1. The upper endpoint of the first class is 9.40. If the lower end is 9.30 and the midpoint is 9.35, we simply add the distance between the lower end and the midpoint to calculate the upper end, which in this instance is 9.35 + 0.05 = 9.40.

100. Consider the following stem-and-leaf plot:

Stem	Leaf
1	0 2 5 7
2	2 3 4 4
3	0 4 6 6 9
4	5 8 8 9
5	2 7 8

Suppose that a frequency distribution was developed from this, and there were 5 classes — (10, 20], (20, 30] etc. Describe the numbers in the (40, 50] class.

Correct Answer:
Section 2.2. Most of the numbers in the (40, 50] class are close to 50.

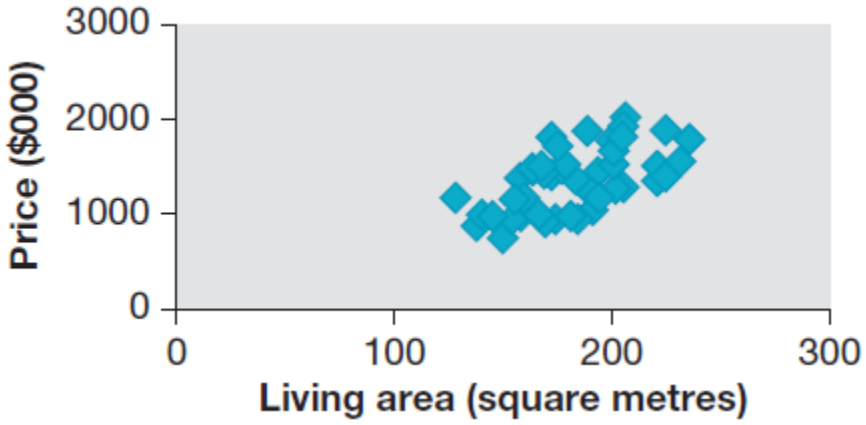
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100. Poor quality in production can often be addressed by attacking a few major causes that result in most of the problems. What type of chart is used to support this process?

Correct Answer:
Section 2.2. A Pareto chart is a vertical bar chart of defects that displays the problems ranked by occurrence from left to right. Reading the chart from the left identifies the defects responsible for most of the problems.

101. Describe the relationship between price and living area evident from the following scatterplot.



Correct Answer:
Section 2.2. As living area increases, so does price. There is a strong positive linear relationship between price and size of living area.

102. What is the advantage of multidimensional visualisation over the use basic charts?

Correct Answer:
Section 2.3. Multidimensional visualisation can display complex information, including the relationships between multiple variables, in an easily understandable way. Basic charts are limited to displaying one or two variables.

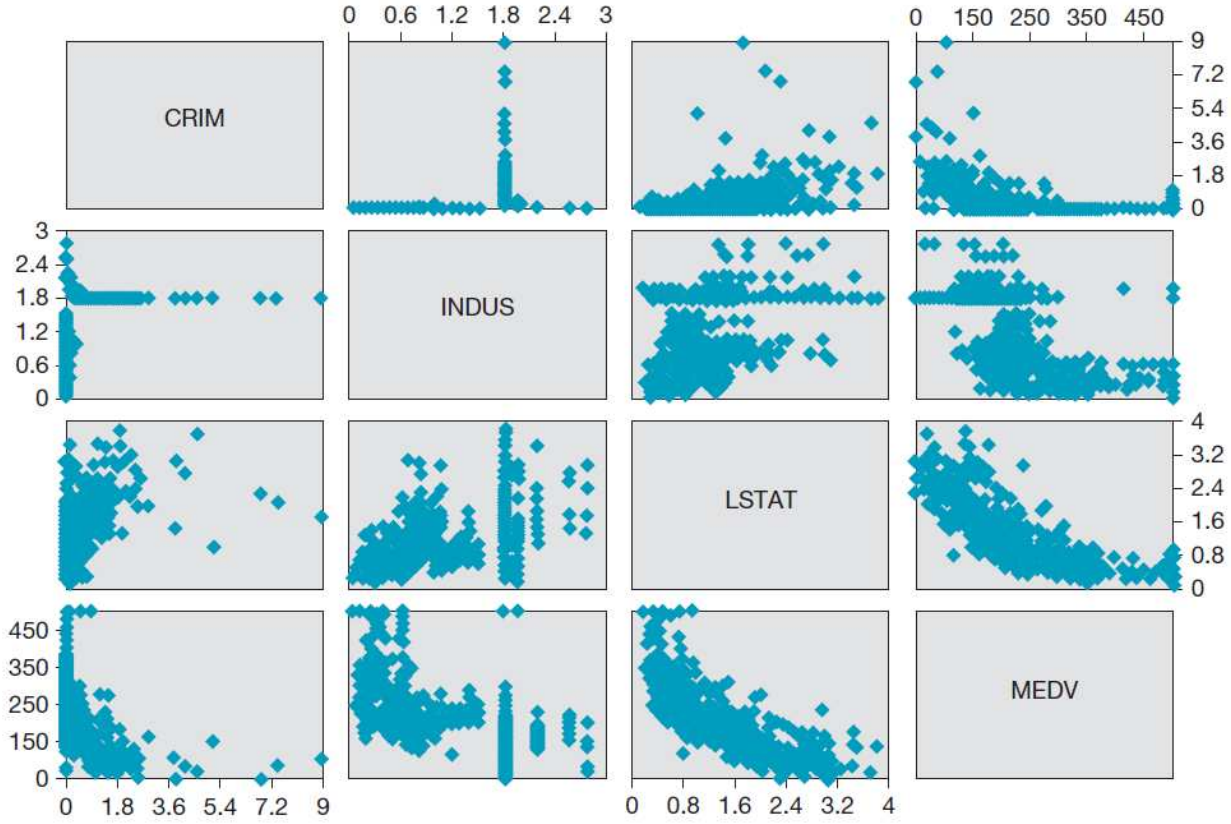
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103. Why is animation an effective technique for representing temporal data?

Correct Answer:
Section 2.3. Animation allows a display to change over time, reflecting the changing (or not changing) relationships between variables in time-series data.

104. What is the following plot called and why is it a useful visualisation?



Correct Answer:
Section 2.3. The plot is a scatterplot matrix. It displays all possible pairwise relationships between all the variables.

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105. Visualisation researcher Ben Shneiderman said ‘A picture is worth a thousand words. An interface is worth a thousand pictures.’ What does he mean?

Correct Answer:
Section 2.4. A picture is worth a thousand words suggests that some information can be more effectively communicated using a picture than a textual description. An interface is worth a thousand pictures suggests that being able to interact with a data visualisation enables the user to more effectively understand the information being presented than would be possible from a static chart.

106. Excel is limited in its ability to produce sophisticated data visualisations, particularly in comparison to specialist software such as Spotfire and Tableau. However, Excel is used in more businesses than any of the specialist software. Why do you think this is so?

Correct Answer:
Section 2.4. Excel is relatively cheap, relatively easy to use and is installed on the computers in many offices. Many businesses’ data visualisation needs do not extend beyond basic charts. Specialist software is often expensive and, despite sometimes having user-friendly interfaces, requires a considerable investment of time in order to efficiently use it. Many businesses do not engage in the sort of multivariate analyses that require multidimensional and interactive visualisations.

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