Chapter 1

Describing Data with Graphs

Exercise 1 Identify each of the following variables as qualitative (categorical) or quantitative. If quantitative, then classify it as either discrete or continuous.

a. A list of candidates running for student committee.
b. The length of time required for a wound to heal when using a new medicine.
c. The number of telephone calls arriving at a switchboard per ten-minute period.
d. The distance first-year college women can kick a football.
e. The number of pages per job coming off a computer printer.
f. The kind of trees used as a Christmas tree.

Exercise 2 The following is a list of numbers of students taking a statistical course classified by majors.

Major	Frequency	Relative Frequency	Percent	Angle
CS	8			
Med. Science	7			
Food Science	10			
Others	5			
Total	30			

2.1) Identify the variable. Is it qualitative or quantitative?
2.2) What graphical methods could you use to describe the data?
2.3) What proportion of the students are CS major?
2.4) What proportion of the students are Med. Science or Food Science major?

Exercise 3 A garbage carrier would like to start charging by the weight of a customer's garbage rather that the number of cans. The weights (in kg.) of 50 randomly selected cans of garbage are summarized in the table below.

Weight	Frequency
4.9 to < 8.9	9
8.9 to < 12.9	11
12.9 to < 16.9	20
16.9 to < 20.9	5
20.9 to < 24.9	5

3.1) Find the relative frequency of all classes.
3.2) Give the percentage of garbage cans weighed at least 16.9 kg.
3.3) What fraction of garbage cans weighed less than 12.9 kg?
3.4) What graph is most appropriate for describing the table above?
3.5) Would you describe the shape as roughly symmetric, skewed right, or skewed left?
3.6) Construct a frequency histogram.

Exercise 4 A small set of data produces a stem-and-leaf plot shown below:

Stems	Leaves
0	0 1 1 5 6 7 8
1	1 1 2 3
2	6 8
3	4

4.1) How many observations are there in this data set?
4.2) Read all actual values of the 2nd row.
4.3) What are the maximum and minimum observations?
4.4) Describe the shape of the distribution.

Exercise 5 A sample of 20 students taken a STAT course has the following total scores.

89	96	68	89	99	68	90	71	82	80
69	93	56	86	93	80	77	82	80	97

Construct a stem and leaf plot.

Exercise 6 Construct a stem and leaf plot of these data.

6.1)

142	165	134	113	145	164	98	122	127	136
145	154	123	152	94	139				

6.2)

4.32	4.36	4.38	4.70	5.15	5.33	6.51	7.32	7.39	7.56
8.21	8.50	8.65	9.17						

Exercise 7 **From the textbook, EXERCISE 1.26**

The length of time (in months) between the onset of a particular illness and its recurrence was recorded for $n = 50$ patients:

2.1	4.4	2.7	32.3	9.9	9.0	2.0	6.6	3.9	1.6
14.7	9.6	16.7	7.4	8.2	19.2	6.9	4.3	3.3	1.2
4.1	18.4	.2	6.1	13.5	7.4	.2	8.3	.3	1.3
14.1	1.0	2.4	2.4	18.0	8.7	24.0	1.4	8.2	5.8
1.6	3.5	11.4	18.0	26.7	3.7	12.6	23.1	5.6	.4

a) Construct a relative frequency histogram for the data.
b) Would you describe the shape as roughly symmetric, skewed right, or skewed left?
c) Give the fraction of recurrence times less than or equal to 10 months.

Exercise 8 Based on Exercise 6.1, use MegaStat Excel (or any statistical package) to
a) construct a dotplot,
b) construct a stem and leaf plot,
c) construct a boxplot,

Answers

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1. a) qualitative b) quantitative c) quantitative
   d) quantitative e) quantitative f) qualitative
2.

Major	Frequency	Relative Frequency	Percent	Angle
CS	8	0.27	27%	96
Med. Science	7	0.23	23	84
Food Science	10	0.33	33	120
Others	5	0.17	17	60
Total	30			

2.1) major 2.2) bar chart 2.3) 8/30 2.4) 17/30

3.

3.1)

Weight	Frequency	Rel. Frequency
4.9 to < 8.9	9	0.18
8.9 to < 12.9	11	0.22
12.9 to < 16.9	20	0.4
16.9 to < 20.9	5	0.1
20.9 to < 24.9	5	0.1

3.2) 0.2 3.3) 2/5 3.4) a histogram 3.5) skewed right.

4. 14; 11, 11, 12, 13; 34 and 0; skewed to the right
5.

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

6.

Stem	Leaf
9	4 8
10	
11	3
12	2 3 7
13	4 6 9
14	2 5 5
15	2 4
16	4 5

stem unit = 10
leaf unit = 1