

Chapter 4
Describing Data
Displaying and Exploring
Data
Examples

Example (1) :

Make a stem and leaf plot of the algebra test scores given below.

(Then complete each question)

56, 65, 98, 82, 64, 71, 78, 77, 86, 95, 91, 59, 69, 70,
80, 92, 76, 82, 85, 91, 92, 99, 73

Solution:

Put the scores in numerical order

56, 59, 64, 65, 69, 70, 71, 73, 76, 77, 78, 80, 82, 82,
85, 86, 91, 91, 92, 92, 95, 98, 99

Since the data range from 56 to 99, the stems range from 5 to 9. To plot the data, make a vertical list of the stems. Each number is assigned to the graph by pairing the unit's digit, or leaf, with the correct stem. The score 56 is plotted by placing the units digit, 6, to the right of stem 5.

- What was the lowest score on the algebra test?

56

- What was the highest score on the algebra test?

99

- In which interval did most students score?

91 to 99 (7 students)

- How much is the sample size by the shape?

23 students

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

- Example (2) : Use a Stem-and-Leaf Plot to Find **Mean, Median and Mode** of a set data

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

Solution:

According to the shape of the original data is:

35 , 36 , 37 , 38 , 40 , 40 , 41 , 42 , 43 , 55 , 55 , 55 , 56
, 57 , 58 , 59

1. The mean = 46.68
2. The median = 42.5
3. The mode = 55

Example (3): Consider the following cotinine levels of 40 smokers:

- Find the quartiles and the 40th percentile.

0	87	173	253	1	103	173	265	1	112
198	266	3	121	208	277	17	123	210	284
32	130	222	289	35	131	227	290	44	149
234	313	48	164	245	477	86	167	250	491

Solution:

First note that before we start our computations we must sort the data

0	1	1	3	17	32	35	44	48	86
87	103	112	121	123	130	131	149	164	167
173	173	198	208	210	222	227	234	245	250
253	265	266	277	284	289	290	313	477	491

Lower Quartile:

$$\text{Location of LQ: } L_{25} = (n + 1) \frac{25}{100} = 41 * 0.25 = 10.25$$

By reference to the data Element No. 10 = 86 and No.11= 87

$$Q1 = 86 + 0.25(87 - 86) = 86.25$$

Second Quartile: (Median)

$$\text{Location of SQ: } L_{50} = (n + 1) \frac{50}{100} = 41 * 0.5 = 20.5$$

By reference to the data Element No. 20 = 167 and No.21= 173

$$Q2 = \text{median} = 167 + 0.5(173 - 167) = 170$$

Upper Quartile:

Location of UQ $L_{75} = (n + 1) \frac{75}{100} = 41 * 0.75 = 30.75$

By reference to the data element No. 30= 250 and No.31= 253

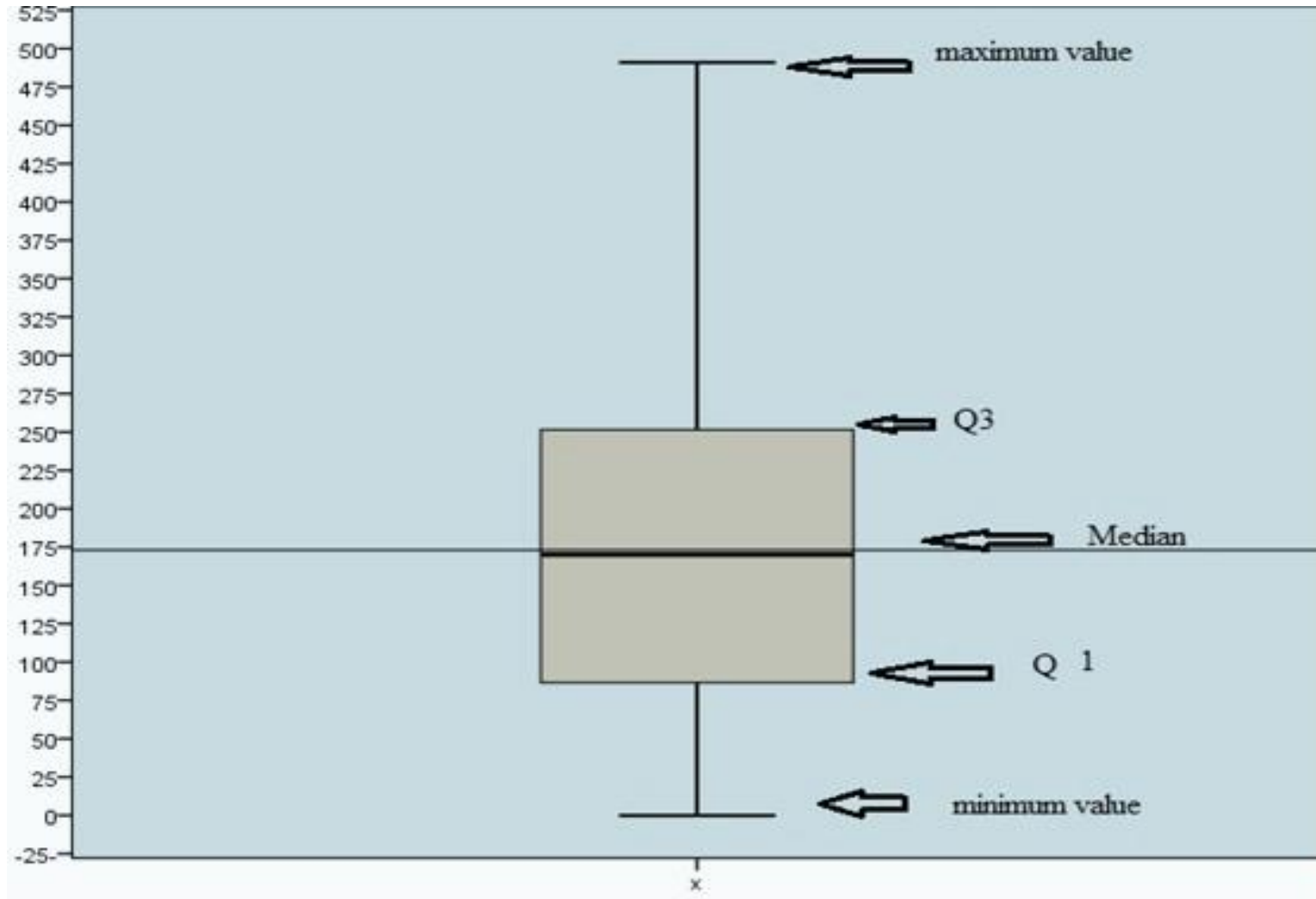
$$Q3 = 250 + 0.75(253 - 250) = 252.25$$

40th Percentile

Location of 40th Percentile: $L_{40} = (n + 1) \frac{40}{100} = 41 * 0.4 = 16.4$

$$40th = 130 + 0.4(131 - 130) = 130.4$$

- **Example (4):** The following graph represents data example 3



Example (5) : The local ice cream shop keeps track of how much ice cream they sell versus the noon temperature on that day. Here are their figures for the last 11 days :

And here is the same data as a Scatter Plot:

Ice Cream Sales vs Temperature	
(X) Temperature °C	(Y) Ice Cream Sales
14.2°	215\$
11.9 °	185\$
15.2 °	332\$
18.5 °	406\$
22.1 °	522\$
19.5 °	412\$
25.1 °	416\$
23.4 °	544\$
18.1°	421\$
22.6°	445\$
17.5°	408\$

