
SOLUTIONS TO
TEST YOUR KNOWLEDGE: Descriptives

A firm wants to establish how long it is supposed to take to assemble a certain product. A random sample of 13 employees is selected and the company measures how long it takes each of them to assemble the product rounded to the nearest minute.

Data: 16; 8; 11; 9; 14; 22; 20; 16; 30; 25; 19; 16; 15

Solve the following by hand.

$$\Sigma X_i = 221$$

Ordered array:

8 9 11 || 14 15 16 16 16 19 20 || 22 25 30
 $Q_1=12.5$ $Q_2=16$ $Q_3=21$

1. The mean is: $221 / 13 = 17$ minutes
2. The median is: 16 minutes
3. The mode is: 16 minutes
4. The first quartile is: 12.5 minutes
5. The third quartile is: 21 minutes
6. The range is: $30 - 8 = 22$ minutes
7. The IQR is: $21 - 12.5 = 8.5$ minutes
8. The variance is: $468 / 12 = 39$ minutes²
[see work for hand calculations on the next page]
9. The standard deviation is: $\sqrt{\text{variance}} = 6.24$ minutes
10. The coefficient of variation is: $\frac{6.24}{17} \times 100\% = 36.7\%$
11. Convert the 8 into a Z-score: $\frac{8-17}{6.24} = -1.44$
12. Convert the 30 into a Z-Score: $\frac{30-17}{6.24} = +2.08$
13. Solve the above using MS Excel. [Compare with the Excel output and check your work.]

Work sheet for #8, variance:

X	\bar{X}	$(X - \bar{X})$	$(X - \bar{X})^2$
8	17	-9	81
9	17	-8	64
11	17	-6	36
14	17	-3	9
15	17	-2	4
16	17	-1	1
16	17	-1	1
16	17	-1	1
19	17	+2	4
20	17	+3	9
22	17	+5	25
25	17	+8	64
30	17	+13	169
		0	468

II. Multiple-choice:

1. Which of the following is not a measure of location? (a) mean (b) median (c) variance (d) percentile (e) quartile
2. Which of the following statements is false? (a) the median is a measure of central tendency (b) quartiles are not measures of central tendency (c) the 50th percentile is the median (d) an extreme value is likely to have a greater effect on the median than the mean (e) the 25th percentile is the first quartile (Q1)