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 minutes^2
[see work for hand calculations on the next page]

9. The standard deviation is: $\sqrt{variance}$ = 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 50^{th} percentile is the median (d) an extreme value is likely to have a greater effect on the median than the mean (e) the 25^{th} percentile is the first quartile (Q1)