Lecture 2 written assignment

Introduction
For this assignment, you have to calculate descriptive statistics for two different sets of data and compare them to another. The objective of this task is to test your comprehension of the concepts from the lecture. Therefore, it is required that you show your work instead of just submitting the result of a calculation when asked to do so. This means that you should:

i) Report the formula you use in its general notation.

   Example: $\text{Range} = x_{max} - x_{min}$

ii) Report the formula with the data values inserted.

   Example: $Range = 8 - 2$

iii) Report the result of your calculation in a complete sentence.

   Example: The range of variable X is 6

1) Take a look at the table below. It contains the scores of ten test subjects on two different interval-scaled variables: *(5 Points)*

Subject Nr.	Variable A	Variable B
1	10	11
2	8	9
3	13	10
4	4	11
5	12	10
6	17	9
7	2	4
8	10	10
9	6	10
10	12	16

a) Calculate the median, mean, variance and standard deviation of variable A. Round the results to two decimal places. Show your work!

Answer:

Ordering: 2,4,6,8,10,10,12,12,13,17

- Median: $\frac{x_{i_{\frac{n}{2}}}+x_{i_{\frac{n}{2}+1}}}{2} = \frac{x_5+x_6}{2} = \frac{20}{2} = 10$

The median of variable A is 10.

- Mean: $\frac{\sum_{i=1}^{n} x_i}{n} = \frac{2+4+6+8+2*10+2*12*13+17}{10} = 9{,}4$

The mean of variable A is 9,4.

- Variance: $\frac{\sum_{i=1}^{n}(x_i-\bar{x})^2}{N-1}$

$$= \frac{(2-9{,}4)^2+(4-9{,}4)^2+(6-9{,}4)^2+2*(10-9{,}4)^2+2*(12-9{,}4)^2+(13-9{,}4)^2+(17-9{,}4)^2}{9}$$

$$= 20{,}27$$

The variance of variable A is 20,27.

-standard deviation: $\sqrt{20{,}27} = 4{,}50$

The standard deviation of variable A is 4,50.

Calculate the median, mean, variance and standard deviation of variable B. Only report the results of your calculations here:

Answer:

Variable B	
Median:	10
Mean:	10
Variance:	8,44
Standard Deviation:	2,91

b) Which variable has a higher dispersion? Answer this question based on the calculations you did in a) and b)

Answer: Variable A has a higher dispersion since variance and subsequently the standard deviation are higher than for B.

Lecture 2 Excel assignment

2) Open the datafile 02_Homework_Data_Excel.xls. It contains the results of a 800 meter race with 75 participants from three different teams, with the time to finish reported in seconds. *(5 points)*

   a) Calculate and report the mean and the standard deviation of the time to finish for each team. Round the results to the nearest second.

   Answer:

Team	Mean	Standard Deviation
A	*220*	*22*
B	*255*	*50*
C	*290*	*22*

   b) Generate a boxplot of the time to finish for team B and paste it here.

   Answer: