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LAB SET 01 EXCEL APPLICATIONS - I
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You are given the following data for a small student club *OLEYBE* with 5 students. The random variable (Y) is defined as the *total minutes per day spent on internet*.

Avni	: 150
Betül	: 120
Can	: 90
Dilaver	: 60
Esra	: 30

- 1) Suppose you are interested in the *total minutes per day spent on internet* of the members of *OLEYBE* student club. In this case, the data set given above is a *sample* or *population*? Calculate the *mean*, the *variance* and the *standard deviation* in Excel in two ways:
 - a. First, by using Excel's *ready formulas* for mean, variance and standard deviation (such as VAR, VARP, STDEV, STDEVP, AVERAGE)
 - b. Then, by using only Excel's *ready formulas* for *four arithmetic operations* (addition, subtraction, multiplication, and division) and square root (i.e., SQRT)
- 2) Suppose you are interested in the *total minutes per day spent on internet* of the members Turkey's all student clubs. In this case, the data set given above is a *sample* or *population*? Calculate the *mean*, the *variance* and the *standard deviation* in Excel by two ways:
 - a. First, by using Excel's *ready formulas* for mean, variance and standard deviation (such as VAR, VARP, STDEV, STDEVP, AVERAGE)
 - b. Then, by using only Excel's *ready formulas* for *four arithmetic operations* (addition, subtraction, multiplication, and division) and square root (i.e., SQRT)

APPENDIX

1. Calculations in Excel: Variance Calculations with Microsoft Excel

A) Variance of a Sample with the VAR Function

If the data set you're working with is a sample and you do not want to include logical values or text from the set in the calculation, you use the VAR function. For example, if you're using a new production process that is supposed to increase productivity and have a series of data for the numbers of parts produced each day, you can find the sample variance. The VAR function uses the following syntax:

$$=VAR(\text{data set range})$$

B) Variance of a Population Sample with the VARP Function

If the data set you're working with is a population and you do not want to include logical values or text from the set in the calculation, you use the VARP function. The VARP function uses the following syntax:

$$=VARP(\text{data set range})$$

2. Some Useful Formulas

Definition 1.1 The *mean* of a sample of n measured responses y_1, y_2, \dots, y_n is given by

$$\bar{y} = \frac{\sum_{i=1}^n y_i}{n}. \text{ The corresponding population mean is denoted } \mu = \frac{\sum_{i=1}^N y_i}{N} \text{ where } N \text{ is}$$

size of population.

Definiton 1.2 The *variance* of a sample of measurements y_1, y_2, \dots, y_n is the sum of the square of the differences between the measurements and their mean, divided by $n-1$.

1. Symbolically, the *sample variance* is $s^2 = \frac{\sum_{i=1}^n (y_i - \bar{y})^2}{n-1}$.

The corresponding *population variance* is denoted by the symbol σ^2 and is given by

$$\sigma^2 = \frac{\sum_{i=1}^N (y_i - \mu)^2}{N} \text{ where } N \text{ is the population size.}$$

Definition 1.3 The *standard deviation* of a sample of measurements is the positive square root of the variance; that is, *sample standard deviation* is $s = \sqrt{s^2}$.

The corresponding *population standard deviation* is denoted by $\sigma = \sqrt{\sigma^2}$.