University of Biskra
Department of Mathematics
First Year License
Descriptive Statistics

Exercise Sheet No. 3

Exercise 1: Discrete Frequency Distribution

Consider the following distribution:

x_i	2	4	6	8	10
f_i	3	5	4	6	2

1. Determine the total frequency.
2. Calculate the arithmetic mean.
3. Calculate the geometric mean.
4. Calculate the harmonic mean.
5. Calculate the variance.
6. Calculate the standard deviation.
7. Determine the mode.
8. Comment on the dispersion of the distribution.

Exercise 2: Grouped Data in Classes

Consider the following distribution:

Class	$[0, 4[$	$[4, 8[$	$[8, 12[$	$[12, 16[$	$[16, 20[$
Frequency	3	7	10	6	4

1. Determine the class midpoints.
2. Calculate the approximate mean.
3. Calculate the approximate variance.
4. Calculate the approximate standard deviation.
5. Calculate the coefficient of variation.
6. Determine the quartiles.
7. Calculate the interquartile range.
8. Calculate the mean deviation.
9. Determine the modal class.
10. Interpret the dispersion of the distribution.

Exercise 3: Coefficient of Variation

Consider the following distribution:

x_i	5	10	15	20	25
f_i	2	4	6	5	3

1. Determine the total frequency.
2. Calculate the mean.
3. Calculate the standard deviation.
4. Calculate the coefficient of variation.
5. State whether the distribution is homogeneous or heterogeneous.
6. Justify your answer.

Exercise 4: Skewness and Kurtosis for Ungrouped Data

Consider the following data set:

$$2,\ 3,\ 4,\ 4,\ 5,\ 6,\ 12$$

1. Calculate the mean.
2. Determine the median.
3. Determine the mode.
4. Calculate the standard deviation.
5. Calculate the first Pearson coefficient of skewness.
6. Calculate the second Pearson coefficient of skewness.
7. Interpret the sign of the obtained coefficient.
8. State whether the distribution is symmetric, positively skewed, or negatively skewed.
9. Compare the mean, the median, and the mode.
10. Calculate the kurtosis parameters.
11. State whether the distribution is mesokurtic, leptokurtic, or platykurtic.

Exercise 5: Kurtosis for Grouped Data

Consider the following distribution:

x_i	2	4	6	8	10
f_i	2	5	8	4	1

1. Determine the total frequency.
2. Calculate the mean.
3. Calculate the necessary central moments.
4. Calculate the kurtosis parameters.
5. State whether the distribution is mesokurtic, leptokurtic, or platykurtic.
6. Interpret the obtained result.