University of Biskra
Faculty of Natural and Life Sciences and Earth Sciences
Academic Year: 2025/2026
L2

Worksheet N°1: Descriptive Statistics

Exercise 01:

A neurologist at the Paris Brain Institute records the **clinical stage** of Alzheimer's Disease (AD) for a cohort of 120 patients to understand the distribution of pathology in their clinic.

Stage of Alzheimer's Disease	**Number of Patients (n_i)**
Pre-symptomatic	18
Mild Cognitive Impairment (MCI)	42
Mild AD	30
Moderate AD	20
Severe AD	10
Total (n)	**120**

1. What is the variable studied in this exercise and what is its specific type (Nature)?
2. Complete the distribution table by calculating the **relative frequencies** (f_i) and the **cumulative frequencies**.
3. Identify the **Mode** of this distribution.
4. Represent this statistical data by the **appropriate graph**. Justify your choice of graph type.

Exercise 02:

A researcher measures **fasting blood glucose levels** (mg/dL) from a sample of 25 laboratory mice to study biological variability.

Measurements: 85, 85, 85, 92, 92, 92, 93, 93, 93, 93, 100, 100, 100, 100, 107, 107, 107, 110, 110, 110, 122, 122, 122, 122, 122.

1. Identify the variable and its nature (Discrete or Continuous).
2. Create the statistical table (frequency, relative frequency, cumulative frequency).
3. Calculate the **Mean** ($\bar{X}$) and the **Quartiles**. Compare the Mean and the Median to determine the symmetry of the distribution.

4. Calculate the **Range** and the **Coefficient of Variation (CV)**. (Note: Assume the standard deviation $s = 16$ mg/dL).

5. Calculate the **Interquartile Range (IQR)**.

6. Represent this statistical data by the **appropriate graphs** (frequencies, and cumulative frequencies).

Exercise 03:

A botanist measures the **shoot length** (in cm) of 30 *Arabidopsis thaliana* plants grown under controlled conditions.

Class (Length in cm)	**Midpoint (x_i)**	**Frequency (n_i)**
$[10, 12[$	..	4
$[12, 14[$	..	12
$[14, 16[$	..	9
$[16, 18]$	..	5

Questions:

1. Determine the nature of this variable.

2. Calculate the mean ($\bar{X}$) for this distribution.

3. Represent the frequencies of this distribution via a graph.

4. Calculate the **Central Tendency Parameters** for this distribution.

5. Calculate the **Dispersion Parameters** for this distribution.

6. Represent the cumulative frequencies of this distribution via a graph.