Exercise sheet n^o 1

One-variable statistical series

Exercice 1.
Indicate the statistical population and the statistical character and its nature for the following cases :

1. the heights of newborn babies at Médéa hospital in january 2024 ;
2. the places of residence of employees of the University of Médéa ;
3. the number of children of hospital employees ;
4. the nationality of participants in the 1982 Olympic Games ;
5. the weights of the rats in laboratory X ;
6. the mother tongue of students at the university of médéa ;
7. the sex of newborns in Algeria in 2023 ;
8. the favourite sport of students of the MI section ;
9. the age of employees at alpha factory ;
10. the blood types of university students ;
11. The number of students in different specialities at the University of Médéa in 2023 ;
12. The distances of the wilaya from the capital ;
13. the eye colour of nursery school children X ;
14. the family situation of hospital employee.

Exercice 2.
What is the nature of the characters below ?

1. Number of shares sold each day on the stock exchange ;
2. Remuneration of lecturers at the University of Médéa ;
3. Household morale indicator ;
4. The pay gap between men and women ;
5. The countries of the African Union ;
6. Employee training levels ;
7. Types of employment contract ;
8. Demographic growth rate in Algeria ?
9. Consumer prices ;
10. Commercial balance ;
11. Number of people per household.

Exercice 3.
In order to test the effect of a drug on an individual's mood, we asked 40 people about the state of their moods after a week of continuous taking of the drug. We obtained the results below :

Excellent	very good	bad	very bad	good	bad	very bad	good
good	bad	very good	bad	excellent	very good	good	good
very good	bad	very bad	very bad	good	good	very bad	bad
very good	very good	bad	good	excellent	bad	bad	excellent
good	very bad	bad	excellent	bad	good	good	bad

1. What are : the population, the character and its nature ?

2. Draw up the table of the absolute frequencies (n_i) representing this statistical serie, calculating the relative (f_i) frequencies and percentages (p_i).

Exercice 4. A survey of 100 employees of a company to collect the following information :

Family status	Number of dependents	Sex	Working conditions
Monthly salary	Number of days of absence	Age	Weight

1. What is it : The population and the individual ?
2. Give two possible modalities for each of these character ;
3. What is the sample size ?

Exercice 5.

We give the breakdown of a section made up of 112 students according to their marks obtained in a final test marked out of 20 points.

10	12	9	7	7	11	12	5	13	10	14	12	12	13	4	12
11	10	15	12	15	15	9	6	5	15	13	11	16	5	18	16
6	5	2	19	9	3	2	6	19	2	3	4	1	18	8	4
4	8	14	5	5	8	3	17	9	5	5	7	10	8	8	9
9	10	7	8	5	7	3	9	4	12	8	10	9	10	5	9
5	10	2	13	10	10	8	1	6	5	6	11	1	15	14	10
9	10	6	10	5	2	6	6	7	10	9	12	13	14	12	10

1. Indicate the population studied, the statistical unit, the character studied and its nature ;
2. Represent the data in a statistical table, calculating the absolute frequencies, percentages and cumulative ascending and descending frequencies ;
3. Determine the arithmetic mean of the marks, the mode and the median ;
4. Group these results into classes of the same range, then draw up a table of the frequencies, specifying the central of the classes, the percentages and the cumulative increasing and decreasing frequencies ;
5. Represent the statistical series graphically ;
6. Determine the mode (by calculation and graphically), median and mean ;
7. Compare the two means and comment on the results.

Exercice 6.

A series of observations of height in adolescents aged 11 to 16 years yielded the following results :

x_i (en cm)	140-144	144-148	148-152	152-156	156-160	160-164	164-168	168-172	172-176
n_i	3	17	63	82	69	31	20	4	2

1. Draw the diagram corresponding to this series ;
2. Determine mode, the median and the mean ;
3. Compare the three parameters. What can we conclude ?
4. What percentage of people are taller than 152 cm, and the percentage of people with a height between 144 cm and 156 cm ;
5. Determine the median et the mode graphically ;
6. Determine the variance and the standard deviation.
