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Module: Probability and Statistics (PST)
2nd Year EM, GM

TD : N°1 (Solution)

Exercise 1:

Statements	True/False
1. A characteristic that is studied is called a variable.	T
2. The task of descriptive statistics is to collect data	F
3. The task of descriptive statistics is to present data in the form of tables and graphs.	T
4. In Statistics, variables are classified according to different types	T
5. The values of the variables are also called modalities.	T
6. For a qualitative variable, each statistical individual can have only one modality.	T
7. Statistical population refers to a group of human beings.	F
8. To each individual in a statistical population, we can associate one or more modalities of a character.	F
9. When the different modalities of a variable are not measurable, it is called a quantitative variable.	F
10. When the values taken by a statistical individual belong to an interval of values, it is called a continuous statistical variable.	T
11. Each individual in the population can be associated with one or more characters.	T

Exercise**2**

For the following study subjects, specify : the statistical unit, the statistical variable, and the study population:

1. Study of the validity time of electric lamps.
2. Study of the absenteeism of workers, in days, in a factory.
3. Distribution of students in a class according to the mention obtained on the Baccalaureate diploma.
4. The diameter of the bolts produced by a machine.
5. The average annual salary of construction workers in Algeria from 1962 to the present.
6. The colors of the cars marketed by Toyota during the year 2013.
7. The sport practiced by each of the students of a school.
8. The number of children per family in a neighbourhood.

Solution:

	Population	Statistical unit	Variable
1	Electric lamps	A lamp	Validity time
2	Works in a factory	A worker	Absenteeism of workers
3	Students in a class	A student	The mention obtained on BAC
4	Bolts produced by a machine.	A bolt	Diameter of bolts
5	Construction workers in Algeria from 1962 to the present.	A construction worker	The average annual salary
6	The cars marketed by Toyota during the year 2013.	A car	The colors of the cars
7	Students	A student	The sport practiced by each student
8	Families in a neighbourhood.	A family	The number of children per family

Exercise 3

Specify the nature of the following variables: Age, eye color, lifespan, nationality, blood type, height, weight, number of children, municipality of residence, income, speed, marital status, level of education, hair color, place of birth, profit of a company, mother tongue, professional categories, number of rooms in an apartment and age of the inhabitants of a commune.

Solution:

Quantitative variable	Qualitative variable
Age, Lifespan, Height, Weight, Number of children, Income, Speed, Profit of a company, Number of rooms in an apartment, The age of the inhabitants of a commune	eye color, Nationality, Blood type, Municipality of residence, Marital status, Level of education, Hair color, Place of birth, Mother tongue, Professional categories,

Exercise 4

We weigh 50 students in a class, we obtain the results summarized in the following table:

Weight (kg)	[40, 45[[45, 50[[50, 55[[55, 60[[60, 65[[65, 70[[70, 80[[80, 100]
Number of students	8	3	7	7	10	5	6	4

1. Identify the population, the variable and statistical unit.
2. Specify the type and nature of the variable.

Solution:

Population	Statistical unit	Variable	Type and nature
50 Students in a class	A student	The weight of students	Quantitative continuous

Exercise 5

Specify the type and the nature of the variable in each of the following examples:

1. The number of children in a family.
2. The time of entry into the factory of a worker.
3. The yield (rendement) of one hectare of wheat (blé).
4. The marital status of an individual (single, married, divorced, widowed).
5. The level of students in a class can be: Excellent, very good, good, medium, low.
6. The lengths of 1000 screws (vis) of a production.
7. The temperature recorded each day in any city

Solution:

Quantitative variable		Qualitative variable	
Discrete	Continuous	Nominal	Ordinal
1	2, 3, 6, 7	4	5

Exercise 6

A survey of a group of students on the number of books that each of them read during the summer holidays gave the following results:

Karim (1); Bilal (02); Ibrahim (03); Souad (05); Dounia (05);² Nawal (00); Malik (02); Reda (01); Hamid (03); Omar (00); Islam (01); Hanane (02); Farid (02); Rachid (03); Zahra(01); Ines (05); Mohamed (00); Khaled (1); Juba (02); Ralik (01); Dihia (03); Khalil (01); Kamel (02); Toufik (02); Djamel (03); Mahdi (01); Nesma (02); Samir (01); Amar (00); Fatiha (02).

1. What is the character studied? specify its nature.
2. What are the different modalities of character.
3. Building the statistical table.

Solution:

Population	Statistical unit	Variable	Type and nature	Modalities
Groupe of students	A student	The number of books read during the summer holidays	Quantitative discrete	0, 1, 2, 3, 5

Statistical table:

xi	0	1	2	3	5
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ni	4	9	9	5	3
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