An exam in statistics 1**(section A&B)**

Solution of Exercise 1 :

A statisticien conducted a survey of 20 adults. She wants to report the frequency distribution of **the ages** of the survey respondents.

The respondents were the following **ages in years**:

52-34-32-29-63-40-46-54-36-36-24-19-45-20-28-29-38-33-49-37

Required:

1- What is the nature of the random variable? Is the variable discrete or continuous?

2- Put the data in an appropriate frequency table.

3- Does the frequency table have the same class width? Justify your answer.

4- Present the above data by using a histogram.

5-calculate the relative frequency table

6-calculate the ascending and descending cumulative frequency tables and provide their graphical representation.

Solution of Exercise 1 :

- Variable type: continuous random variable

- Preparing a suitable frequency table for the data

The range

$$A = e_n - e_0 = 63 - 19 = 44$$

The number of classes

$$k = 1 + 3.322 \log N = 5.32 \approx 6$$

The length of the class

$$a = \frac{A}{k} = \frac{44}{6} = 7.33 \approx 8$$

| X	fi	Rel fi	cf⬆	cf⬇
$[19 - 27[$	3	0.15	3	20
$[27 - 35[$	6	0.3	9	17
$[35 - 43[$	4	0.2	13	11
$[43 - 51[$	4	0.2	17	7
$[51 - 59[$	2	0.1	19	3
$[59 - 67[$	1	0.05	20	1
$\sum$	20	1	/	/

- All the classes have the same length.

Faculty of Economic, Commercial and Management Sciences

1st Semester of the 2024/2025 university year   first year students

An exam in statistics 1**(section A&B)**

- The graphical representation of the ascending and descending cumulative frequency tables.
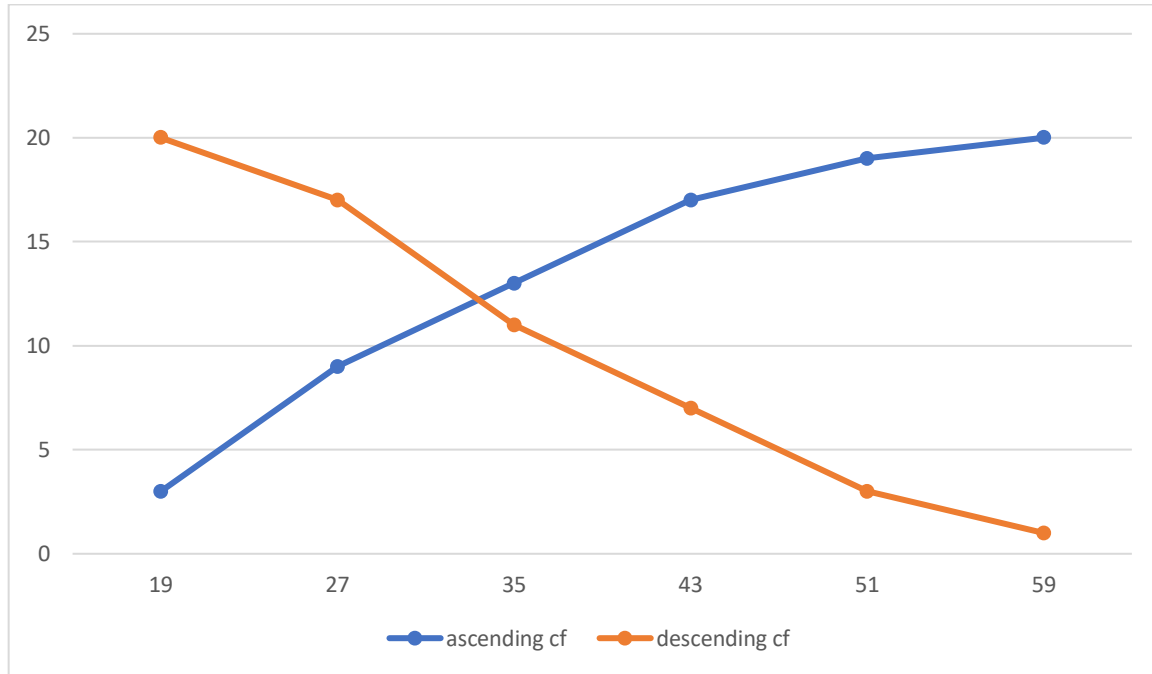
Exercise 2 :

X is the statistical variable distributed as follows:

X	10-20	20-30	30-40	40-50	50-60	60-70
fi	20	18	25	10	12	15

Required:

1- Calculate mode then determine it graphically.
2- Calculate the arthimetic mean.

Solution of Exercise 2 :

−**calculate mode :**

the mode class intervals :

$$[\mathbf{30-40}[$$

$$M_0 = L_1 + \frac{\Delta_1}{\Delta_1 + \Delta_2} * k$$

$$M_0 = 30 + \frac{25 - 18}{(25 - 18) + (25 - 10)} * 10 = 33.18$$

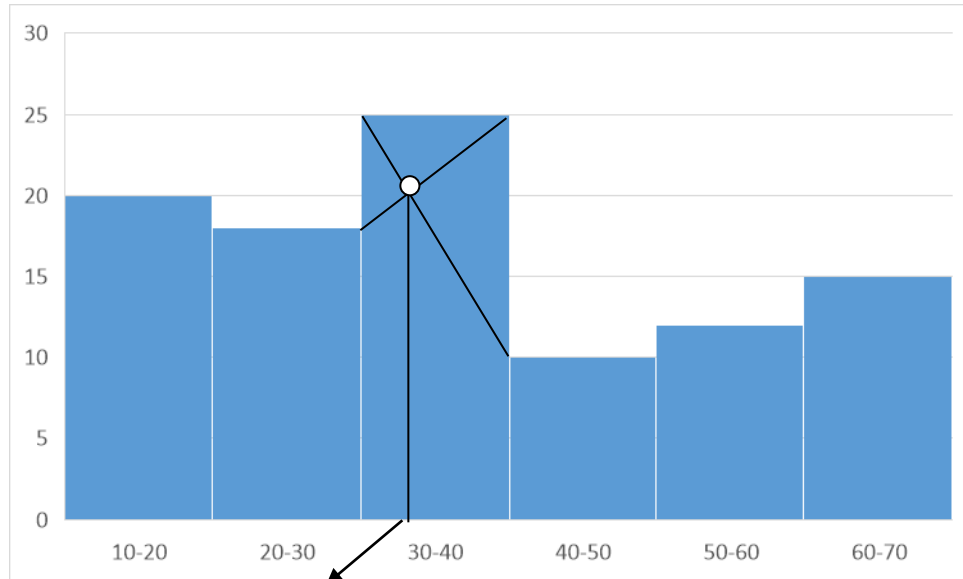-The graphical representation of the mode:

An exam in statistics 1**(section A&B)**

$$M_0 = 33.18$$

- Calculate the arthimetic mean:

X	10-20	20-30	30-40	40-50	50-60	60-70
fi	20	18	25	10	12	15
c_i	15	25	35	45	55	65
$c_i f_i$	300	450	875	450	660	975

$$\bar{x} = \frac{\sum c_i f_i}{N} = \frac{3710}{100} = 37.1$$