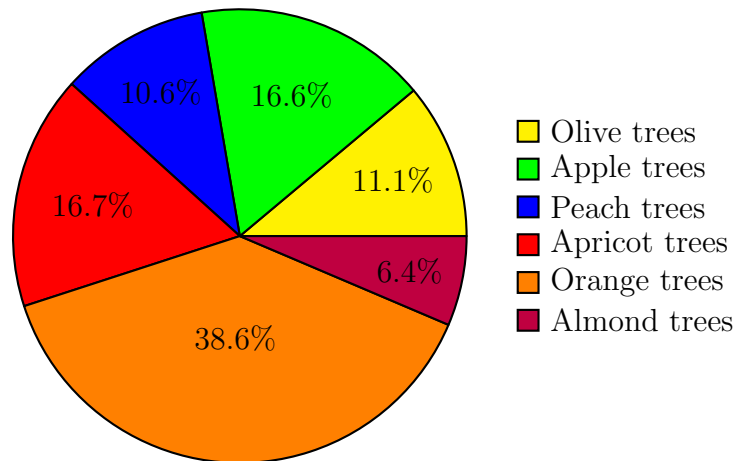


### Solution to Exercise 1

- I (a) The studied population consists of all the fruit trees owned by the agricultural company.
- (b) The observed characteristic is the type of fruit trees, which is a qualitative nominal variable. The modalities are: Olive trees, Apple trees, Peach trees, Apricot trees, Orange trees, and Almond trees.
- (c) Here, we can represent this data through a pie chart or bar graph, showing the distribution of different types of fruit trees based on the given percentages.



**Figure:** Distribution of Fruit Trees in an Agricultural Company

II For each of these two distributions

- (a) The **Population** studied includes all company employees. The **Characteristic Studied** is the socio-professional category. This characteristic is **qualitative ordinal** in nature. The **Modalities** of the characteristic include Senior Managers, Middle Managers, Employees, Workers, Service Staff, and Other Categories. Suitable **Graphical Representations** could be bar charts or pie charts.
- (b) To represent these two distributions on the same graph for effective comparison, a grouped bar chart can be used. This can highlight disparities in gender distribution among different socio-professional categories.

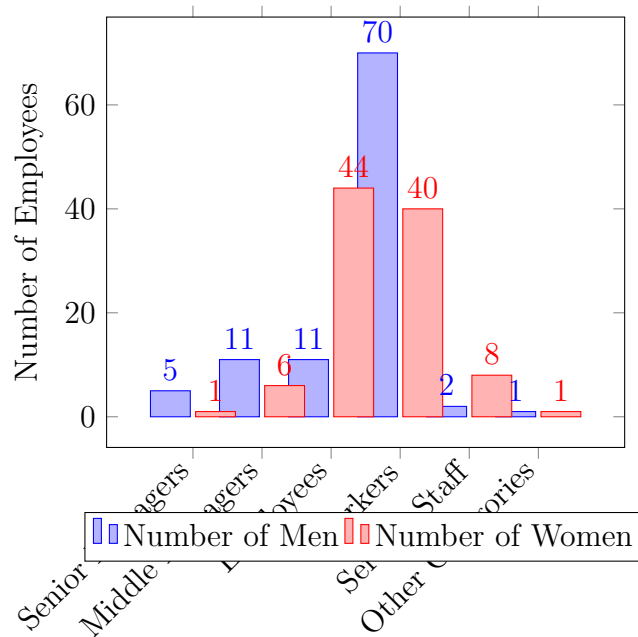


Figure 1: Comparison of Socio-Professional Category Distribution by Gender

Based on the provided distributions and assuming the bar chart, here's the evident conclusions that can typically be drawn from the visual comparison:

- (a) there might be a higher number of men in categories like 'Workers' and 'Senior Managers', while women might dominate in the 'Employees' category.
- (b) Both men and women might be concentrated in specific CSPs, such as 'Workers' for men and 'Employees' for women.
- (c) Women might be underrepresented in higher CSPs like 'Senior Managers'.
- (d) Some categories, such as 'Middle Managers' and 'Other Categories', might show a more balanced gender distribution,

- III (a) The population under study is the set of telephone calls made by an employee over a period of 50 days.

- (b) The observed characteristic is the number of telephone calls made per day. Its nature is quantitative discrete since the number of calls can be counted and listed as whole numbers. The modalities are 0, 1, 2, 3, 4, 5, and 6 calls per day.
- (c) The appropriate diagram to represent this distribution would be a bar chart, where the x-axis represents the number of calls (0, 1, 2, 3, 4, 5, 6), and the y-axis represents the frequency of each number of calls.

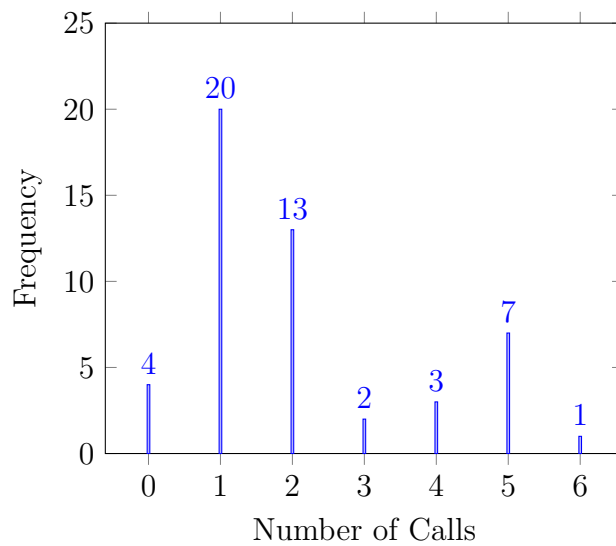


Figure 2: Frequency Distribution of Telephone Calls

- (d) first we calculate the cumulative frequency increasing  $CI_{n_i}$  and decreasing  $CD_{n_i}$ .

Number of Calls	Frequency	$CIn_i$	$CDn_i$
0	4	4	50
1	20	24	46
2	13	37	26
3	2	39	13
4	3	42	11
5	7	49	8
6	1	50	1

Table 1: Cumulative Frequencies of Telephone Calls

(e)

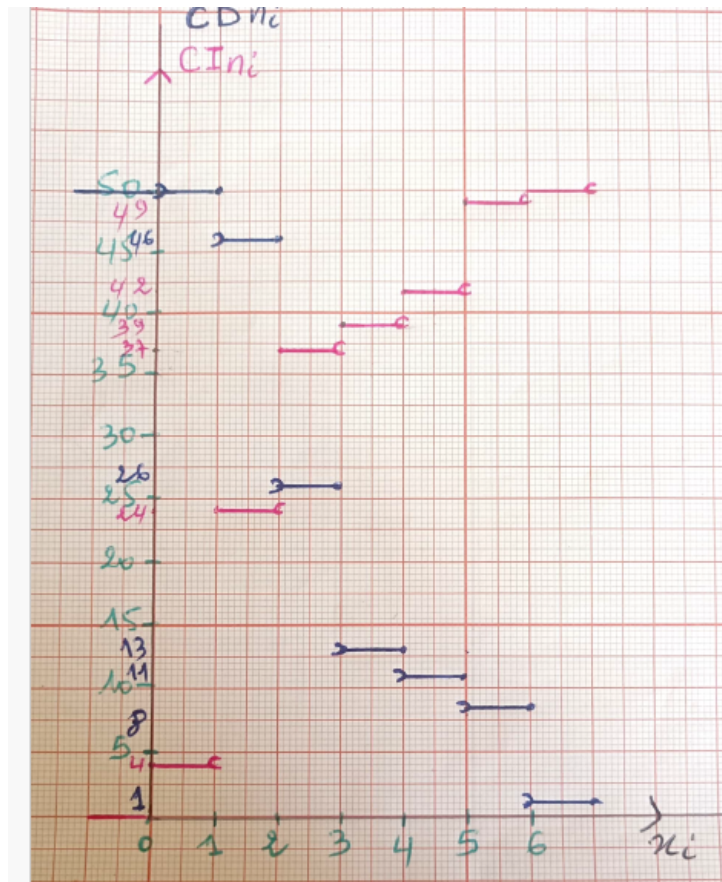


Figure 3: cumulative frequencies curve

- IV (a) The studied population consists of all employees in the company.  
 (b) The observed characteristic is the salary, which is quantitative and continuous.  
 (c) A histogram would be used to represent this salary distribution.

Histogram of Salary Distribution Among Employees

