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 Department of Mechanical Engineering  
 Module: Probability and Statistics (PST)  
 2<sup>nd</sup> Year EM, GM

**TD : N°2**

**Exercise 1:**

A study on the choice of a fruit juice (Pineapple (P), Grape (G), Mongue (M)) was carried out. The survey responses are as follows:

M P G M G P P P M M P M P G M P M G P M G G G M G

M P P M G P P P P G G G M G G M M P G G P G G M G

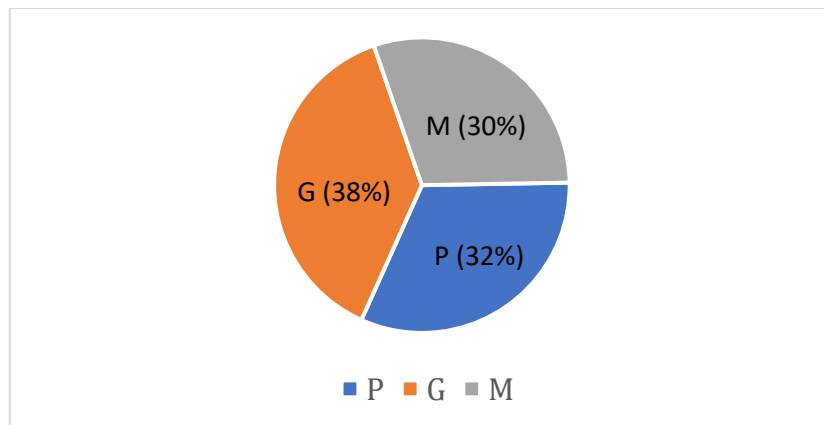
1. What is the population, the character studied, specify its nature and its modalities?
2. Present the results in a statistical table.
3. What is the proportion of people who prefer pineapple juice?
4. Give an adequate graphic representation using the frequencies. .

**SOLUTION**

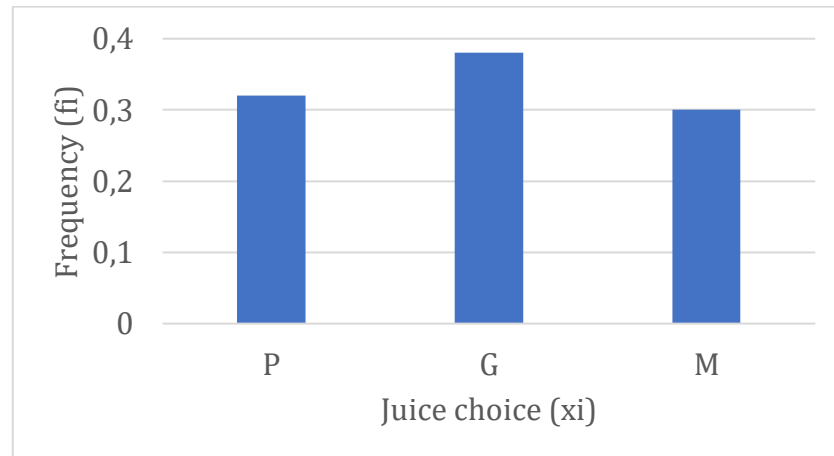
1. **Population:** Consumers; **Variable:** the choice of a fruit juice;  
**Nature of the variable:** Qualitative nominal, **Modalities:** Pineapple, Grape, Mongue.
2. Statistical table:

| X  | Pineapple (P) | Grape (G) | Mongue(M) | Total |
|----|---------------|-----------|-----------|-------|
| ni | 16            | 19        | 15        | 50    |
| fi | 0.32          | 0.38      | 0.3       | 1     |

3. The proportion of people who prefer pineapple juice is 32%.
4. Graphical representation using frequencies:



Pie chart shown the choice of fruit juice.



Organ pipes chart shown the choice of fruit juice.

**Exercise 2:**

A survey of a group babies on the brand of powdered milk used for the ages of 1, 2 and 3 years gave the following results:

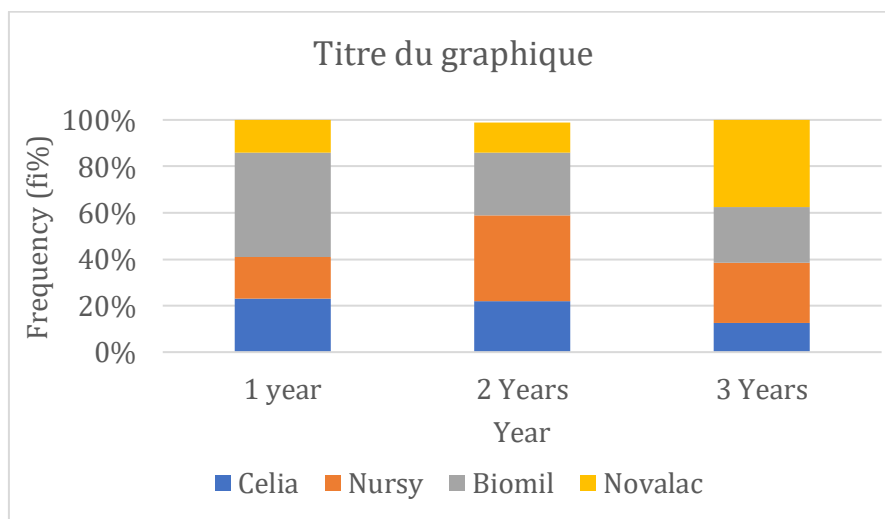
1. Provide a graphical representation for this type of data.

|         | Celia | Nursy | Biomil | Novalac |
|---------|-------|-------|--------|---------|
| 1 Years | 20    | 15    | 38     | 12      |
| 2 Years | 27    | 44    | 33     | 16      |
| 3 Years | 10    | 21    | 19     | 30      |

**Solution :**

Before we Provide the graphical representation, we must build the statistical table.

|         | 1 year |      |     | 2 Years |      |     | 3 Years |       |      |
|---------|--------|------|-----|---------|------|-----|---------|-------|------|
|         | ni     | fi   | fi% | ni      | fi   | fi% | ni      | fi    | fi%  |
| Celia   | 20     | 0.23 | 23  | 27      | 0.22 | 22  | 10      | 0.125 | 12.5 |
| Nursy   | 15     | 0.18 | 18  | 44      | 0.37 | 37  | 21      | 0.26  | 26   |
| Biomil  | 38     | 0.45 | 45  | 33      | 0.27 | 27  | 19      | 0.24  | 24   |
| Novalac | 12     | 0.14 | 14  | 16      | 0.13 | 13  | 30      | 0.375 | 37.5 |
| Total   | 85     | 1    | 100 | 120     | 1    | 100 | 80      | 1     | 100  |



Band chart shown the brand of powdered milk used for the ages of 1, 2 and 3 years.

**Exercise 3:**

The results of a survey concerning the leisure activities of a population of 20 persons are available:

|                |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| <b>Age</b>     | 12 | 14 | 40 | 35 | 26 | 30 | 30 | 50 | 75 | 50 | 30 | 45 | 25 | 55 | 28 | 25 | 50 | 40 | 25 | 35 |
| <b>Leisure</b> | S  | S  | C  | C  | S  | T  | T  | R  | R  | R  | T  | C  | C  | C  | S  | R  | R  | C  | T  | T  |

Codification: S: Sport, C: Cinema, T: Theatre, R: Reading

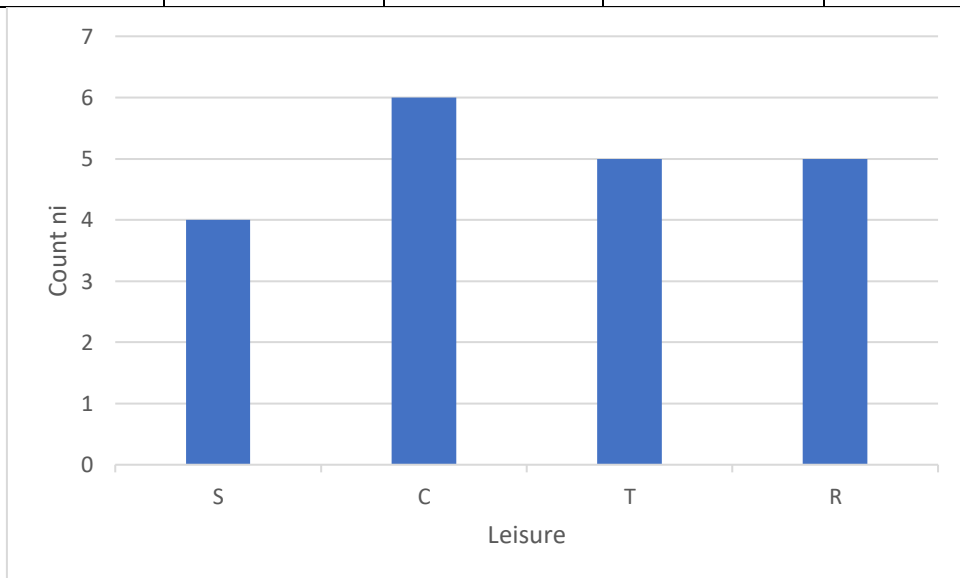
1. What is the total count?
2. What are the values of each character? specify their natures?
3. Draw up the statistical tables.
4. Draw the diagrams corresponding to these characters.

**Solution:**

1. **The total count is: 20**
2. **The values of each character and their natures:**
  - **Variable 1:** The leisure activities: Qualitative nominal.

**Modalities:** S, C, T, R

|                     |          |          |          |          |
|---------------------|----------|----------|----------|----------|
| <b>Xi (Leisure)</b> | <b>S</b> | <b>C</b> | <b>T</b> | <b>R</b> |
| <b>ni</b>           | 4        | 6        | 5        | 5        |

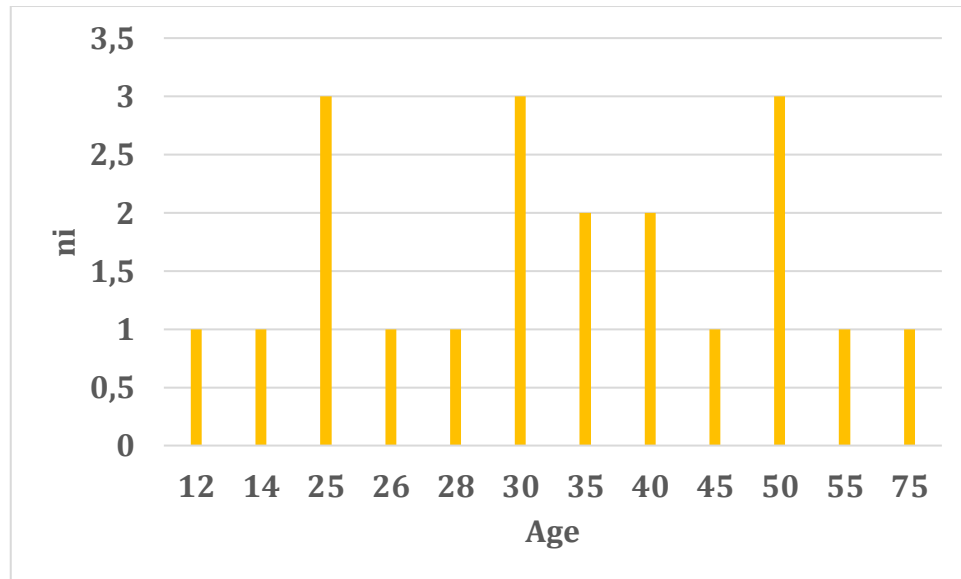


Organ pipes chart shown leisure activities practiced by 20 persons.

- **Variable 2:** The age of 20 persons: Quantitative discrete

**Modalities:** 12, 14, 25, 26, 28, 30, 35, 40, 45, 50, 55, 75.

|           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>xi</b> | <b>12</b> | <b>14</b> | <b>25</b> | <b>26</b> | <b>28</b> | <b>30</b> | <b>35</b> | <b>40</b> | <b>45</b> | <b>50</b> | <b>55</b> | <b>75</b> |
| <b>ni</b> | <b>1</b>  | <b>1</b>  | <b>3</b>  | <b>1</b>  | <b>1</b>  | <b>3</b>  | <b>2</b>  | <b>2</b>  | <b>1</b>  | <b>3</b>  | <b>1</b>  | <b>1</b>  |



Bar chart shown the age distribution of 20 persons.