Quantitative Biology
Topic: Frequency Distribution

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Frequency Distribution & Representation of Data:

Frequency distribution is a statistical table which shows the value of variable arranged in order of magnitude either 'individually or in groups and also the corresponding frequencies side by side.

There are two types of frequency distribution:

i.   Simple frequency distribution
ii.   Grouped frequency distribution

Terms associated with Group Frequency distribution:

1. **Class Interval:**
    When a large number of observation varying in a wide range are available these are classified in several groups according to the size of value. Each of these groups defined by interval is called Class Interval.

2. **Class Limit:**
    In the construction of grouped frequency distribution the class interval must be defined by pairs of number such that the upper end of one class does not coincide with the lower end of the immediate following class. The smaller of the pair is known as lower class limit and larger of the pair is known as upper class limit.

3. **Class Boundary:**
    In most of the measurement of continuous class interval all data are recorded nearest to certain limit, the most extreme value which would ever be included in a class interval are called class-boundary.

4. **Class Mark:**
    It is mid value of class exactly at the middle of class interval.

    $$\text{Class mark} = \frac{\text{Lower Class Limit} + \text{Upper Class limit}}{2}$$

5. **Class-width:**
    It is range of class interval or difference of upper and lower boundaries.

6. **Class Frequency:**

   The number of observations following with in the class is called its class frequency or simple frequency and the sum of all class frequency is called total frequency.

7. **Relative Frequency:**

   It is the ratio of the frequency of the class to the total frequency.

$$\text{Relative frequency of a class} = \frac{\text{Frequency of class}}{\text{Total frequency}}$$

8. **Frequency Density:**

   Frequency density of a class is its frequency per unit width, it shows the concentration of frequency in a class.

$$\text{Frequency Density} = \frac{\text{Class Frequency}}{\text{Width of the Class}}$$

9. **Percentage Class Interval:**

   It is the frequency of class which is expressed as % of the total frequency distribution.

$$\% \text{ of Class} = \frac{\text{Class Frequency}}{\text{Total Frequency}} \text{x } 100$$

Example:

Class Interval	Class frequency	Class limit		Class boundary L U		Class mark	Class width	Frequency density	Relative frequency
15-19	18	15	19	14.5	19.5	17	5	3.6	0.211
20-24	34	20	24	19.5	24.5	22	5	6.8	0.4
25-29	21	25	29	24.5	29.5	27	5	4.2	0.24
30-34	12	30	34	29.5	34.5	32	5	2.4	0.14

Representation of Data:

There are two ways by which we can represent our data:

i.   Diagramatic representation of data
ii.   Graphical representation of data

Diagram always help the visualize the meaning of numerical complex at a single glance. It may be of following types:

1. Bar diagram
2. Pie diagram
3. Line diagram
4. Pictogram

The representation of quantitative data suitably through chart known as graphical representation of data. It may be of following types:

1. Histogram
2. Polygon
3. Ogive