University of Mosul
Lecture No.: 2
College of Veterinary Medicine
Date: 2024-2025
Unit of Scientific Affairs
Website: https://uomosul.edu.iq/veterinarymedicine/

Lecture title: **Statistiscs: Frequency Tables**
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Summary:

- **Descriptive Statistics**
  - ➢ Summarizing data: when data grows it becomes difficult to obtain an overall picture of what happening. The first step is to organize the data and this can be done using tables, diagrams and measures.

    - **Frequency and Frequency Tables**

      The **frequency** of a particular data value is the number of times the data value occurs. A **frequency table** is constructed by arranging collected data values in ascending order of magnitude with their corresponding frequencies.

      Example: The marks awarded for an assignment set for a Year 4 class of 20 students were as follows:

      6 7 5 7 7 8 7 6 9 7
      4 10 6 8 8 9 5 6 4 8

Mark	Tally	Frequency
4	II	2
5	II	2
6	IIII	4
7	HHt	5
8	IIII	4
9	II	2
10	I	1

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When the set of data values are spread out, it is difficult to set up a <u>frequency table</u> for

every data value as there will be too many rows in the table. So we group the data

into **class intervals** (or groups) to help us organize, interpret and analyze the data.

How to set up a frequency table:

1. Find the following:

   Smallest data value, highest data value

   Range= highest data value - Smallest data value

2. Detrmine the number of classes (given in the question)
3. Find class interval / class width

   $$\text{Class interval} = \frac{Range}{Number\ of\ classess}$$

   If the result has decimal it should be raised to a complete number (integer).
4. Determine a column for class lower and upper limits.
5. Prepare tally and frequency columns.
6. Determine a column for class mid-point (class center).
   Class mid-point= $\frac{lower\ class\ limit + upper\ class\ limit}{2}$
7. Determine a column for class boundaries.
   Lower class boundary=mid-point for class- 0.5 class interval
   Upper class boundary=mid-point for class+ 0.5 class interval
8. Count the number of observations to each column called class frequency.
9. Determine column for relative frequency
   Relative frequency= $\frac{class\ frequency}{total\ number}$
10. Determine column for percent relative frequency
    Percent relative frequency= relative frequency * 100

Example:

From the following data construct the frequency table with number of classes = 7

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30	39	54	42	38	32	31	32	25	37
44	33	35	20	37	40	47	32	26	33
45	37	32	35	22	30	51	38	36	35
31	37	40	48	36	33	44	43	38	36
26	32	49	36	32	36	41	38	42	39

1. Range=highest value - smallest value
   = 54-20=34
2. Class interval= Range/no. of classes
   = 34/7=5 (raise to integer)
3. Determine a column for classes limits
4. Prepare tally and frequency columns

Age group (Class)	Tally	Frequency (f)
20-24	1 1	2
25-29	1 1 1	3
30-34	‖‖‖ ‖‖‖ 111	13
35-39	‖‖‖ ‖‖‖ ‖‖‖ 111	18
40-44	‖‖‖ 111	8
45-49	1111	4
50-54	11	2
Total		50

5. Determine class boundaries and mid-points columns

Class boundaries, class interval and midpoints

Age group (Class)	Class boundary	Class interval	Class midpoint
20-24	19.5 to 24.5	5	22
25-29	24.5 to 29.5	5	27
30-34	29.5 to 34.5	5	32
35-39	34.5 to 39.5	5	37
40-44	39.5 to 44.5	5	42
45-49	44.5 to 49.5	5	47
50-54	49.5 to 54.5	5	52

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6. Determine relative and percent relative frequency(cumulative) columns

The frequency of a class divided by the total number of cases (f/n)	(Cumulative Frequency /n) x 100
Relative Frequency	**% Cumulative frequency**
0.04	4.0
0.06	10.0
0.26	36.0
0.36	72.0
0.16	88.0
0.08	96.0
0.04	100.0

- **Frequency Distribution Graphs:**
  1. **Histogram:** it is a vertical rectangles its base located on horizontal axis represented class boundaries while the height represents frequencies of class vertical axis.
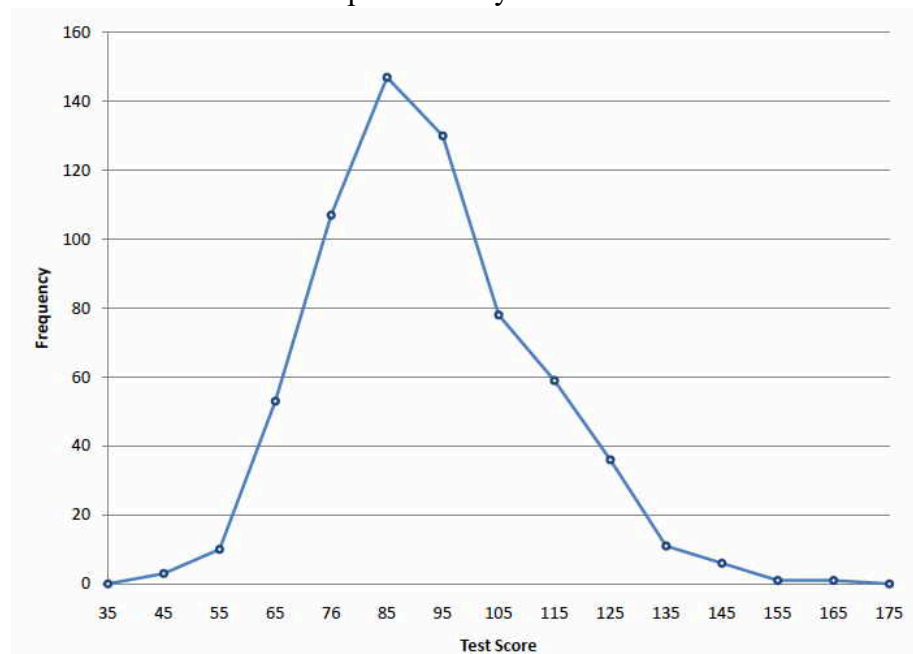
     Example: for the following data construct the frequency distribution table and then draw the histogram.
     70,64,99,55,64,89,87,65,62,38,67,60,69,78,39,70,75,56,71,51,99,68,95,86,57,53,47,50,55,81,80,98,51,34, 63,66,85,79,83,70

no.	class	frequency	class mid-points	class boundaries
1	31-40	3	35.5	30.5-40.5
2	41-50	2	45.5	40.5-50.5
3	51-60	8	55.5	50.5-60.5
4	61-70	12	65.5	60.5-70.5
5	71-80	5	75.5	70.5-80.5
6	81-90	6	85.5	80.5-90.5
7	91-100	4	95.5	90.5-100.5

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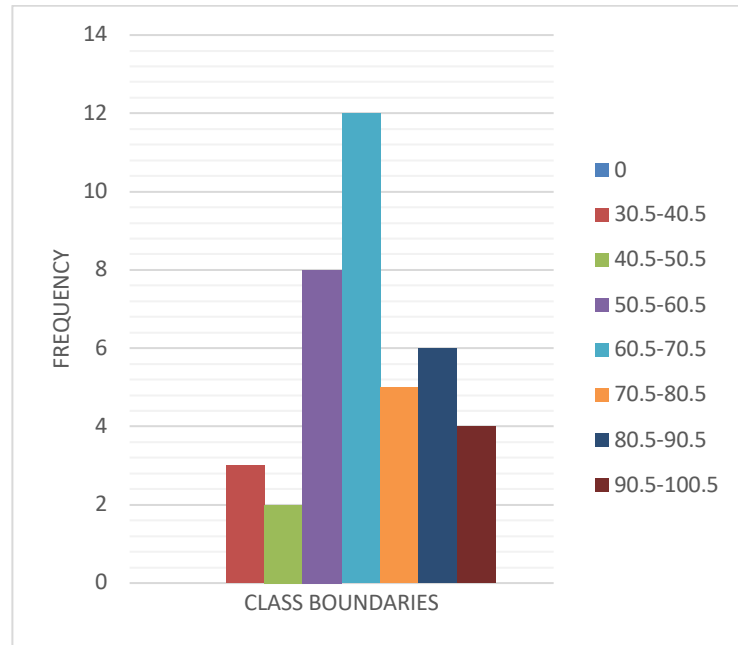
2. **Frequency Polygons**: are graphical diagrams that helping understand the shape of distribution. In order to create a polygon we start as the same with a histogram, then we mark the middle of each class labeling it with the middle value represented by the class.