

**Welcome To....**



**Chapter 02:  
Data Presentation (part 1)**

## Learning outcomes

- Know the appropriate tool for data presentation
- Exploring fact from data

# Type of Data Presentation

1. Tabular Presentation of Data.

Frequency Distribution

2. Graphical Presentation of Data.

Qualitative Variable

- Bar chart
- Pie Chart

Quantitative Variable

- Histogram
- Frequency Polygon
- Ogive curve
- Line graph
- Boxplot
- Scatter Diagram

3. Textual Presentation of Data.

Use Words, statements or paragraphs with numbers to present data.

# Contents

- Definition of Frequency Distribution with Examples
- Construction of Frequency Distribution for quantitative data
- Graphical presentation of quantitative data

# Frequency distribution with Examples

## Frequency distribution:

A grouping of data into mutually exclusive categories or different classes showing the number of observations in each category or class is called **frequency distribution**.

## Types of Frequency Distribution:

Fasting blood glucose level in diabetics at the time of diagnosis

Fasting glucose level	No of diabetics		
	Male	Female	Total
120-129	8	4	12
130-139	4	4	8
140-149	6	4	10
150-159	5	5	10
160-169	9	6	15
170-179	9	9	18
180-189	3	2	5
	44	34	78

Frequency distribution for Quantitative data

Type of smartphone	Tally	Frequency
Android		12
Window Phone		8
Iphone		15
Amazon's fire phone		5
		Sum = 40

Frequency distribution of types of smartphones owned

Frequency distribution for Qualitative data

## Construction of frequency distribution for quantitative data

### Construction of frequency distribution:

#### Example:

Mr. Rahman is a professor of X University. He wishes prepare to a report showing the number of hours per week students spend studying. He selects a random sample of 30 students and determines the number of hours each student studied last week.

15.0, 23.7, 19.7, 15.4, 18.3, 23.0, 14.2, 20.8, 13.5, 20.7, 17.4, 18.6, 12.9, 20.3, 13.7, 21.4, 18.3, 29.8, 17.1, 18.9, **10.3**, 26.1, 15.7, 14.0, 17.8, **33.8**, 23.2, 12.9, 27.1, 16.6.

Organize the data into a frequency distribution.

# Construction of frequency distribution for quantitative data

**Step 1: Decide on the number of classes** using the formula

$$2^k \geq n$$

Where k=number of classes  
n=number of observations

There are 30 observations so  $n=30$

Two raised to the fifth power is 32.

Therefore, we should have **at least 5** classes, i.e.,  $k=5$ .

**Step 2: Determine the class interval or width** using the formula

$$i \geq (H - L) / k = \frac{(33.8 - 10.3)}{5} = 4.7. \text{ Round up to the next integer of 5 hours.}$$

**Step 3: Set the individual class limits** and

**Steps 4 and 5: Tally and count the number of items in each class.**

# Construction of frequency distribution for quantitative data

Table-1: Frequency Distribution of the number of hours per week students spend on studying

Upper limit	Hours studying	Tally	Frequency, $f$
Lower limit	10-15	HHH II	7
	15-20	HHH HHH II	12
	20-25	HHH II	7
	25-30	III	3
	30-35	I	1

Exclusive frequency table

Class interval =  
Upper limit - Lower limit =  
15 - 10 = 5

This table is just for understanding, not necessary for this math

Example: Inclusive frequency table

Students present	Frequency, $f$	Cumulative frequency
15-19	3	3
20-24	6	9
25-29	2	11
30-34	5	16
35-39	4	20
Total	$n=20$	

Class interval =  
Upper limit - Lower limit + 1 =  
19 - 15 + 1 = 5



## Graphical presentation of frequency distribution for quantitative data

**Three types of graphical presentation for quantitative data are:**

1. Histogram
2. Frequency Polygon
3. Ogive Curve/ Cumulative Frequency Curve

Class boundaries	Frequency
99.5-104.5	2
104.5-109.5	8
109.5-114.5	18
114.5-119.5	13
119.5-124.5	7
124.5-129.5	1
129.5-134.5	1

**Draw the following graphs for this temperature data.**

- Histogram
- Frequency Polygon
- Ogive Curve/ Cumulative Frequency Curve

# Graphical presentation of frequency distribution for quantitative data

From the calculation of the following table we will learn how to draw all the 3 mentioned graphs.

Col-1	Col-2	Col-3	Col-4	Col-5	Col-6
class	Frequency ( $f_i$ )	Relative frequency ( $\frac{f_i}{n}$ )	Percentage frequency ( $\frac{f_i}{n} * 100$ )	Midpoints (U+L)/2	Cumulative Frequency
99.5-104.5	2	2/50	2/50*100	102	2
104.5-109.5	8	8/50	8/50*100	107	10
109.5-114.5	18	18/50	18/50*100	112	28
114.5-119.5	13	13/50	13/50*100	117	41
119.5-124.5	7	7/50	7/50*100	122	48
124.5-129.5	1	1/50	1/50*100	127	49
129.5-134.5	1	1/50	1/50*100	132	50
Total	n=50	1			

Lower limits

upper limits

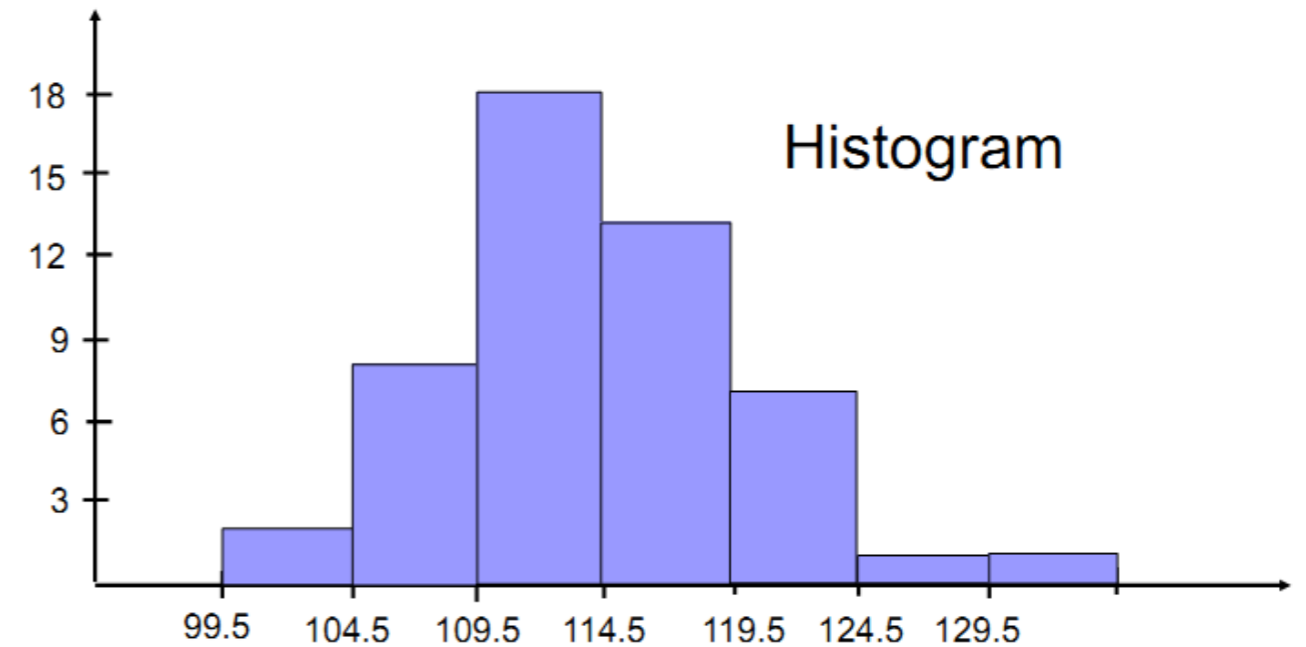
1. Histogram:  
Col-1 & 2.

2. Frequency polygon:  
Col-1, 2 & 5.

2. Ogive curve:  
Col-1 (upper limits) & col-6.

## Graphical presentation of frequency distribution for quantitative data

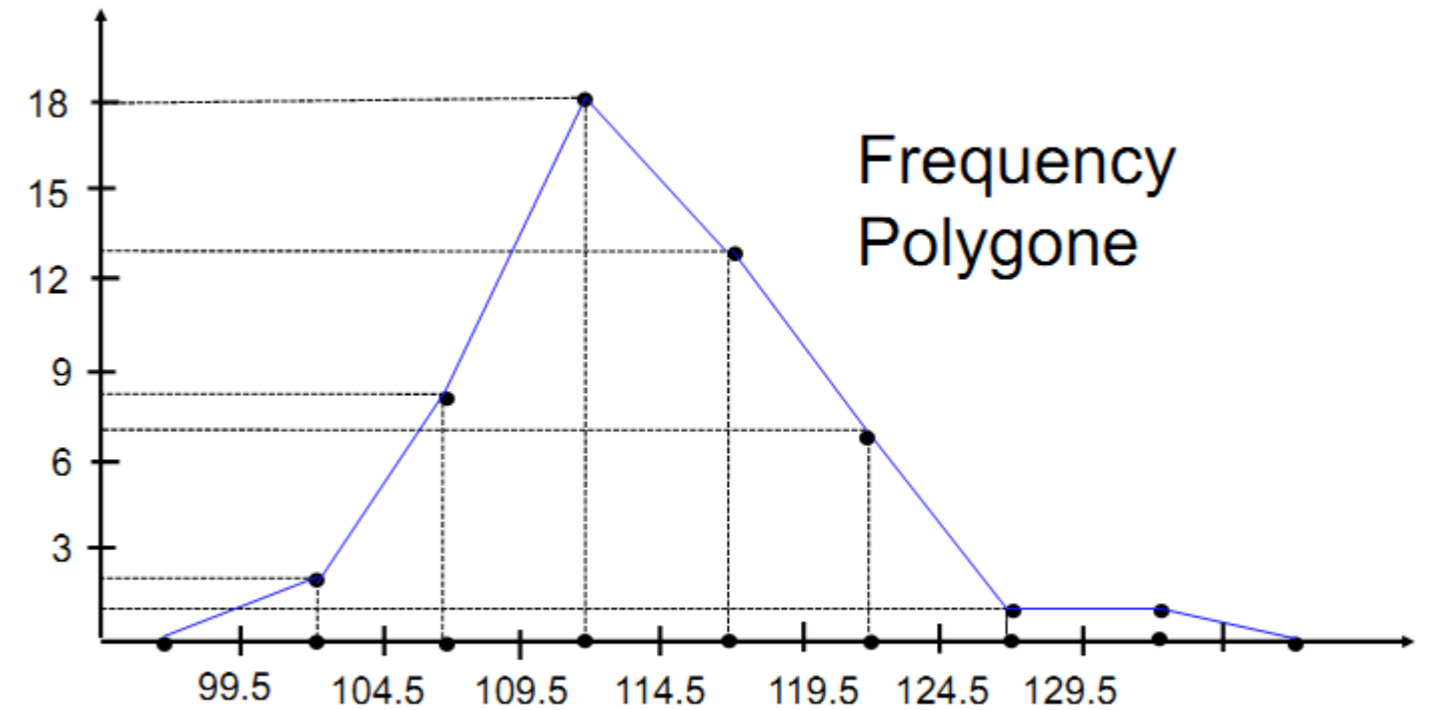
class	Frequency ( $f_i$ )
99.5-104.5	2
104.5-109.5	8
109.5-114.5	18
114.5-119.5	13
119.5-124.5	7
124.5-129.5	1
129.5-134.5	1
Total	n=50



- The largest concentration is in the class 109.5 – 114.5.

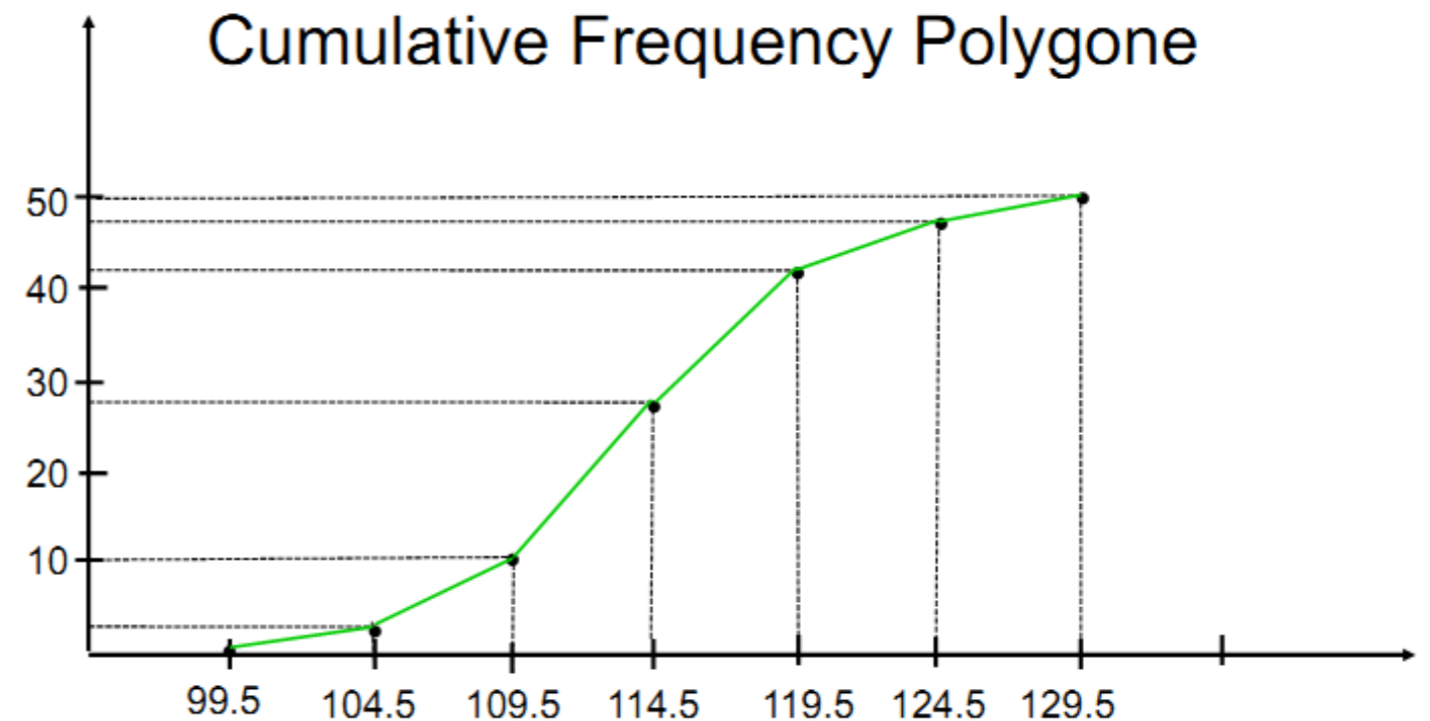
## Graphical presentation of frequency distribution for quantitative data

class	Frequency ( $f_i$ )	Midpoints ( $U+L$ )/2
99.5-104.5	2	102
104.5-109.5	8	107
109.5-114.5	18	112
114.5-119.5	13	117
119.5-124.5	7	122
124.5-129.5	1	127
129.5-134.5	1	132
Total	n=50	



## Graphical presentation of frequency distribution for quantitative data

class	Frequency ( $f_i$ )	Cumulative Frequency
99.5-104.5	2	2
104.5-109.5	8	10
109.5-114.5	18	28
114.5-119.5	13	41
119.5-124.5	7	48
124.5-129.5	1	49
129.5-134.5	1	50
Total	n=50	



## Exercise to solve

The number of walking shoes sold in 20 different shops are given below:  
45, 70, 70, 55, 75, 73, 70, 65, 68, 60, 74, 83, 80, 58, 68, 85, 90, 64, 75, 82

- Construct a frequency distribution table using appropriate class interval.
- Draw Histogram, frequency polygon and ogive curve.
- How many shops were able to sold more than 70 shoes?

