Learning Outcome

By the end of this lecture, you will be able to:

Reproduce frequency graphs based on the frequency table: histogram, frequency plot, frequency polygon, relative frequency plot, relative frequency polygon and cumulative frequency plots and polygons

Introduction

A frequency distribution summarizes a large set of data into a simple table. Given here is a frequency distribution (frequency table) that depicts the weight of certain college students.

Class interval x (Weight in kg)	Tally	Frequency f
40-45	II	2
45-50	IIII	4
50-55	𝍸	5
55-60	𝍸 III	8
60-65	𝍸	5
65-70	IIII	4
70-75	II	2
		30

Frequency table

The information provided in this table can be presented using various types of plots. These plots help interpret the data provided in the frequency table.

Bar chart

Line chart

In this lecture, you will be able to reproduce various types of frequency graphs based on the frequency table.

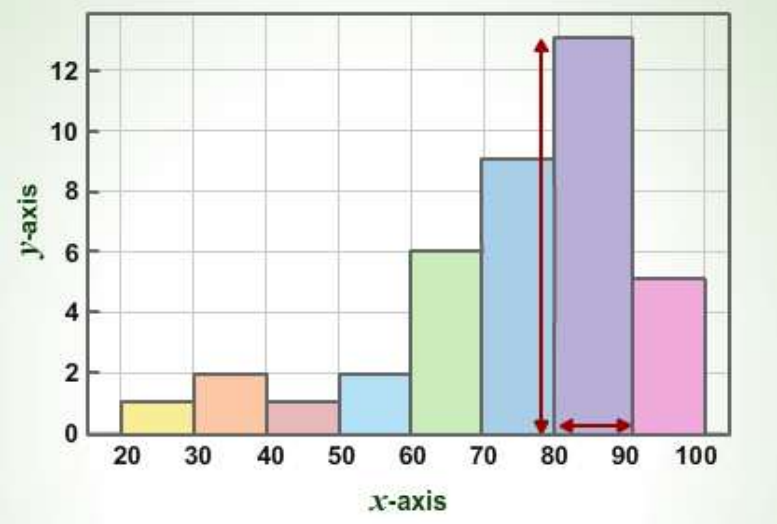
Histogram

A histogram is a graph in which each class is represented by bar.

The base of the bar represents the length of the class.

Its height represents the frequency (and it is called a frequency histogram) or the relative frequency (and it is called a relative frequency histogram).

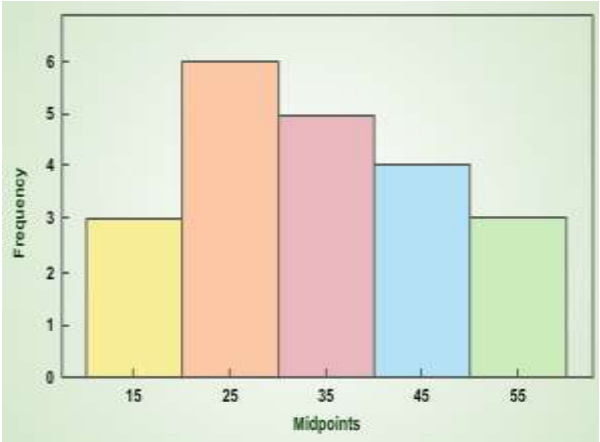
Also, the class midpoint can be used on the x-axis.



Example

Given here is a frequency distribution (frequency table) showing class, frequency, and midpoint.

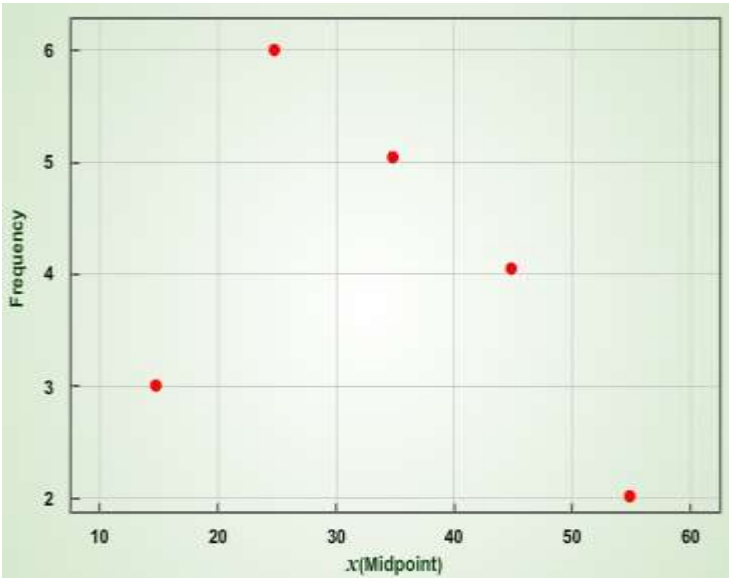
Class	***f***	**Midpoint** x_i
[10 , 20)	3	15
[20 , 30)	6	25
[30 , 40)	5	35
[40 , 50)	4	45
[50 , 60)	2	55
Total	20	



Frequency histogram

Frequency Plot

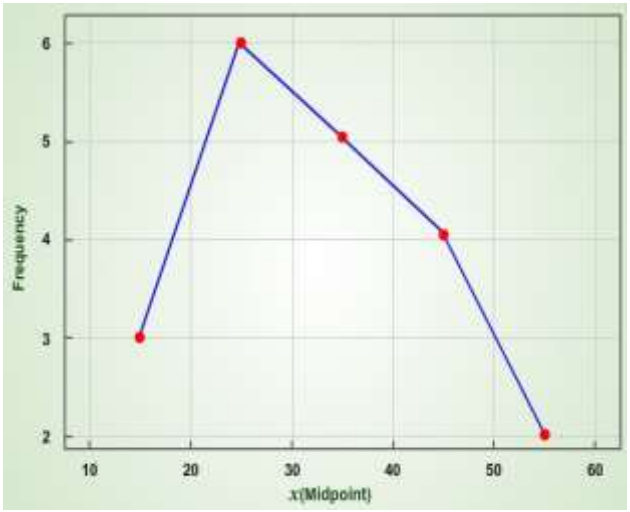
A frequency plot is formed by plotting the frequency of each class (y-axis) against their midpoints (x-axis). Use the relative frequency on the y-axis to obtain the relative frequency plot.



Frequency Plot

Frequency Polygon

When we join the points in the frequency plot by lines we obtain the frequency polygon. Use the relative frequency on the y-axis to obtain the relative frequency polygon.



Frequency polygon

Cumulative Relative Frequency Polygon (Ogive)

It shows percentage of observations below the upper limit. Obtained by plotting the cumulative relative frequency (on the y-axis) against the upper limit of each class (on the x-axis) and we start plotting using the lower limit of the first interval with the cumulative frequency 0.

Class	*Upper limit*	*f*	Cumulative relative frequency
			0%
[10 , 20)	20	3	15%
[20 , 30)	30	6	45%
[30 , 40)	40	5	70%
[40 , 50)	50	4	90%
[50 , 60)	60	2	100%
Total		**20**	

Cumulative relative frequency polygon

Recap

In this lecture, you have learned that:

- A histogram is a graph in which each class represented by bar
- A frequency plot is formed by plotting the frequency of each class (y-axis) against their midpoints (x-axis)
- When we join the points in the frequency plot by lines we obtain the frequency polygon
- A cumulative relative frequency polygon shows percentage of observations below the upper limit