

Median For Grouped Data

1- we calculate the rising frequency

$$2 - \text{Median} = \frac{\sum f_i}{2}$$

$$3 - F_{k-1} < \sum \frac{F_i}{2} < F_k$$

↓ ↓

التكرار المبلغ الصاعد السابق المبلغ اللاحق

4- The class of Median is the class which is frequency is K , then median (Midpoint of the class)

Example

Classes	Frequency	Upper Limit	Rising Frequency
2-4	6	Less than or equal 4	6
5-7	9	Less than or equal to 9	15
8-10	12	Less than or equal to 12	27 $\rightarrow F_{k-1}$
11-13	20	Less than or equal to 20	47 $\rightarrow F_k$
14-16	14	Less than or equal to 14	61
17-19	11	Less than or 11	72
20-22	8	Less than or 8	80
	80		

Solution:-

الترتيب الوسيطى

$$\frac{\sum f}{2} = \frac{80}{2} = 40$$

$$27 < 40 \leq 47$$

the class of Median is the fourth class

$$\text{Med} = \frac{11 + 13}{2} = 12$$

Example:- Find the Median for the following table which present the outcome for 80 families

Classes	Frequency	Upper Limit	Rising Frequency
100 -	3	Less than 120	3
120 -	7	Less than 140	3 + 7 = 10
140 -	14	Less than 160	24
160 -	20	Less than 180	44
180 -	18	Less than 200	62
200 -	12	Less than 220	74
220 - 240	6	Less than 240	80
	80		

(11)

$$\frac{\sum f}{2} = \frac{80}{2} = 40$$

$$Med = A + \left[\frac{\frac{\sum f_i}{2} - F_{k-1}}{f_k} \right] \cdot L$$

For continuous variable.
Where

A : Lower limit of the Median

F_{k-1} : The previous ascending clustered iteration of the broker class

f_k : Duplicate the mediator class

L : The length of the median class

$$24 < 40 < 44$$

The class 160-180

$$A = 160, L = 20, f_k = 20, F_{k-1} = 24$$

$$Med = A + \left[\frac{\frac{\sum f_i}{2} - F_{k-1}}{f_k} \right] \cdot L$$

$$= 160 + \left[\frac{40 - 24}{20} \right] \times 20$$

$$= 176$$

Graphical Presentation

1- The pie Graph: It is a geometric shape in which the types of data are divided into sectors within the circle. Each sector represents a percentage of a specific group of the total data. To determine each sector, the angle of each must be determined as follows:

$$\text{Sector angle} = \frac{\text{Number of data for each category}}{\text{Sum of total data}} \times 360$$

Example: - The number of students in a college 2000 students, 800 in first class, 500 in second class, 400 in third class, 300 in the fourth class present the data using pie

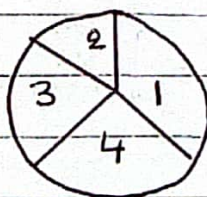
Solution

$$\text{sector angle of first class} = \frac{800}{2000} \times 360 = 144$$

$$\text{sector angle of second class} = \frac{500}{2000} \times 360 = 90$$

$$\text{sector angle of third class} = \frac{400}{2000} \times 360 = 72$$

$$\text{sector angle of Fourth class} = \frac{300}{2000} \times 360 = 54$$



2-Frequency Histogram: It's a set of rectangles. The base of each represents the length of the category in the frequency distribution. The height of each represents the frequency value corresponding to that category. In the case of discrete variables, the rectangles are separate, and in the case of continuous variables, the rectangles are continuous.

Classes	Frequency
60-74	4
75-89	5
90-104	10
105-119	12
120-134	16
135-149	7
150-164	6

