

LAB. METEOROLOGICAL STATISTICS FOURTH STAGE

(First Semester)

Department of Atmospheric Sciences

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Lecturers :

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((Third Lecture))

A- **Median**: It is known in mathematics or statistics, and it is one of the measures of central tendency, which is the middle numerical value. It separates the higher value from the sample or the population from the lower half so that the number of values on its side is equal after being arranged in ascending or descending order.

The methods of calculating the median differ according to the different values whose median is to be known. The odd numerical values differ from the even ones. To know the method of calculating it, we must

1-Calculation of the median for Unclassified data odd numbers

For example\\ calculate the median of the following data?

[5,6,9,2,1]

Solve\\

- Arrange in ascending or descending order [1,2,5,6,9]

- Because the values are individual, we choose the median value, which represents the **median =5**

2-Calculation of the median for Unclassified even numbers

For example\\ calculate the median of the following data?

53	47	49	53	52	50
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Solve\\

- Arrange in ascending or descending order

53	53	52	50	49	47
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-To find the median of the even values, by finding the average of the two average values, i.e.

$(50+52)\div 2= 51 \longrightarrow \text{Median}=51$

3-Calculating the median for the classified data: to find the median for the classified values, we apply the following equation:

$$\text{Median} = L1 + \left(\frac{\frac{N}{2} - F}{f_{\text{median}}} \right) * c$$

Whereas: L1= Minimum middle class, N= Total repetitions, C= Category length

$\frac{N}{2}$ = The value that falls within or below it and rounds up the result

F = Cumulative pre-intermediate class frequency

F= Cumulative mean class frequency

For example \\ Calculate the median for the following data:

Solve\\

Class	frequency	cumulative f
20-29	6	6
30 – 39	8	14
40 – 49	12	26
50 – 59	10	36
60- 69	14	50

$\sum f = n = 50 \longrightarrow \frac{N}{2} = \frac{50}{2} = 25$

C =Category length \longrightarrow C= 10; mediator class=(40-49) \longrightarrow L1=40; F=14;

f (median)=12

Median = L1 + $\left(\frac{\frac{N}{2} - F}{f_{\text{median}}} \right) * c \longrightarrow = 40 + \left(\frac{25 - 14}{12} \right) * 10 \longrightarrow = 40 + 9.17 \longrightarrow$

med=49.17

For example \\ Calculate the median for the following data:

Solue\\

<u>Class</u>	<u>frequency</u>	<u>cumulative f</u>
50-59	3	3
60-69	7	10
70-79	18	28
80-89	12	40
90-99	8	48
100-109	2	50

$$\sum f = n = 50$$

$$N/2 = 50/2 = 25$$

$$L1 = 70; F = 10; f = 18; C = 10$$

$$\text{Median} = L1 + \left(\frac{\frac{N}{2} - F}{f_{\text{median}}} \right) * c \implies = 40 + \left(\frac{25 - 10}{18} \right) * 10 \implies = 40 + 8.33 \implies$$

med = 48.17

H.W\\

1- If you know that the city of Baghdad recorded the highest monthly average temperatures during the past year (33,20,54,56,50,48,58,28,50,31,24,19). Calculate the median value of the temperature data.

2- Calculate the median for the data listed in the table below:

<u>Class</u>	<u>frequency</u>
120 - 129	5
130 - 139	7
140 - 149	10
150 - 159	8
160- 169	6
170-179	4