LAB. METEOROLOGICAL STATISTICS & METEOROLOGICAL DATA ANALYSIS

FOURTH STAGE

(First Semester)

Department of Atmospheric Sciences

2026 – 2027

Lecturers :

Dr. Khawla zaki , Dr. Farah haseeb , As.pro. Ruaa mazin L. Luma mahdi,

L. Yasamin qusay, L. Salwa salman, L. Shiemaa Awda

, A.L.Zahraa Abdul Razzaq, A.L. Hala ali

Preparing by: Dr. Farah Haseeb, As.pro. Ruaa mazin , L. Luma Mahdi

Measures of Central Tendency:

A- ***The arithmetic mean***: is defined as the ratio of the sum of values to their total number and is commonly used in many applications. The arithmetic mean falls under the so-called measures of central tendency, and the arithmetic mean is divided according to the type of data into two types:

Calculate the arithmetic mean of the ungrouped data:

1- Calculation of the arithmetic mean for unclassified data(Direct method):

$$\overline{x} = \frac{\sum X_i}{n} \quad \text{..... (1)}$$

For example\\ calculate The arithmetic mean of the following data?

X_i = 4,8,2,4,6,9,5,1

First: We write the values and then define the function to calculate the arithmetic mean

Mean = average (select the first cell **:** Select the last cell) then **enter**

Mean = 4.875 ……. Arithmetic mean

***Calculation of the arithmetic mean of the classified data**:

$$\overline{x} = \frac{\sum f_i X_i}{\sum f_i} \quad \text{.....(2)}$$

For example\\ calculate The arithmetic mean of the following data?

X_i	f_i
3	2
5	5
7	3
9	6
11	2
13	4
15	7
17	9

Solue

First Multiply numbers $\boldsymbol{fixi}$ Then we calculate the sum, then calculate the sum of $\boldsymbol{f_i}$ Then we divide

$\underline{X_i}$	$\underline{f_i}$	$\underline{Xi\ fi}$
3	2	**6**
5	5	**25**
7	3	**21**
9	6	**54**
11	2	**22**
13	4	**52**
15	7	**105**
17	9	**153**
	∑fi=38	**∑xifi=435**

$$\textbf{mean} = \frac{\sum f_i X_i}{\sum f_i} = \frac{438}{38} = 11.526$$

2- Calculating the arithmetic mean for unclassified data (the indirect method)

$\bar{x} = A + \frac{\sum u_i}{n}$ **whereas** $u_i = X_i - A$ **n= Data number**

A : default element (any number)

$\underline{X_i}$	A	ui= (X_i – A)
4	4	0
8	4	4
2	4	-2
4	4	0
6	4	2
9	4	5
5	4	1
1	4	-3

$$\bar{x} = 4 + \frac{\sum u_i}{8}$$

H.W

1-Calculate the arithmetic mean, the monthly averages of the values of rain falling on the city of Baghdad for the year 2007

jan	Feb	Mar	Apr	Nov	Der
60	112	75	129	88	101
62	68	89	85	75	60
116	83	85	127	127	80
68	65	99	78	68	92
100	60	78	97	83	91
85	104	98	88	77	97
92	78	62	60	85	62
68	97	63	80	61	63

2- calculate The arithmetic mean of the following data?

Class	Fi
31-40	1
41-50	2
51-60	5
61-70	15
71-80	25