LAB. METEOROLOGICAL STATISTICS &METEOROLOGICAL DATA ANALYSISFOURTH STAGE

(First Semester)

Department of Atmospheric Sciences

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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

Metrics of skewness and kurtosis

A-The skewness

Skewness means the asymmetry of the frequency distribution curve around the center point (mean).

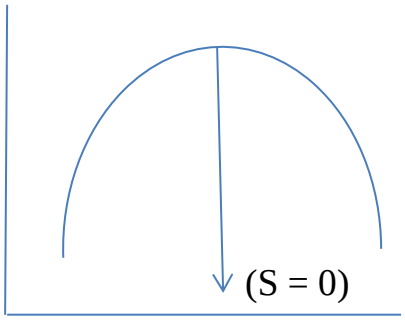
so the frequency distribution curve is symmetrical about the center point (mean) ,if we drop a column from the top of the frequency curve and divide it into two parts, as for the opposite, the distribution is Asymmetric, meaning that it is skewed, either to the right or to the left. The skew scale is used to know the quality of the skewness of the frequency distribution.

*If the skewness scale is **positive**, this means that the arithmetic mean **is greater** than the median and that **the right side is more stretched**, and therefore **the skew is towards the right.**

*if the skewness scale is **negative**, meaning that the arithmetic mean is **smaller** than the median, then this means that **the skewness is towards the left and the left side is the largest.**

The shape of the frequency distribution curve can be known from calculating the skew coefficient where:

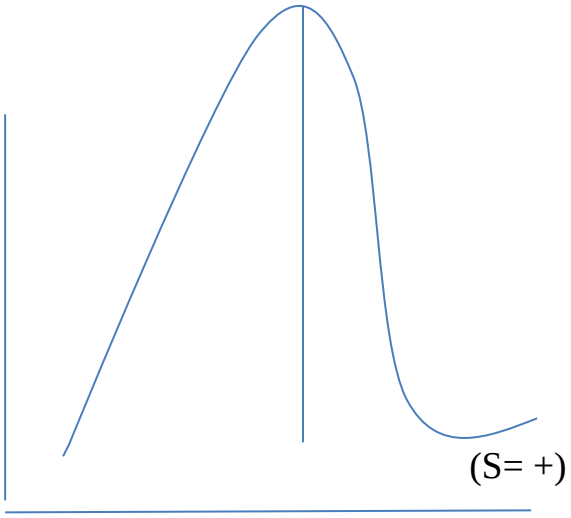
1- If the value of the skew coefficient is(Sk = 0-0.5) , So (arithmetic mean = median) and thus that the frequency distribution curve is symmetrical.



symmetric

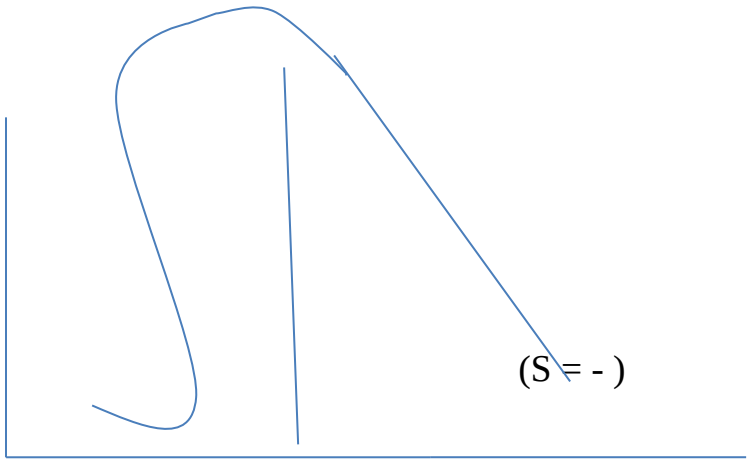
2- If the value of the skew coefficient is positive (S = +0.6 – +0.9) , So (median < the arithmetic mean), This indicates that the frequency distribution curve is skewed to **the right**

towards the right



Mean > median

3- If the value of the skew coefficient is negative (S = -), So (median > the arithmetic mean), This indicates that the frequency distribution curve is skewed **to the left**



median> Mean

The skew coefficient is extracted from the descriptive statistical report:

1- Enter the data for which you want to calculate the skewness.

2- From functions , choose (statistic), Then we choose it (Describe data), Then we choose it (SKEW).

For example\\ For the following data, explain whether there is skewness in the frequency distribution curve (2,4,6,8,10,8,6,4,2).

For example\\ For the following data, explain whether there is skewness in the frequency distribution curve (15,18,12,20,22,15,8,16,20,12,13).

B- kurtosis

It is a measure of the degree of height of the value of the frequency distribution (ie, the amount of decrease and height) in relation to the normal frequency distribution.

* If the kurtosis coefficient is(K = 3)The frequency distribution curve **is moderate**.

*If the kurtosis coefficient is(K > 3)The frequency distribution curve **is tapered** .

* The frequency distribution curve is obtuse (K < 3) The frequency distribution curve is **flat** .

The kurtosis coefficient is extracted from the descriptive statistical report:

1- Enter the data for which you want to calculate the kurtosis.

2- From functions , choose (statistic), Then we choose it (Describe data), Then we choose it (KURT).

For example\\ For the following data, explain whether there is kurtosis in the frequency distribution curve (5,9,6,3,2,4).

For example\\ For the following data, explain whether there is skewness and kurtosis in the frequency distribution curve (-5,-7,-3,-4,-9).

H.W\\ Calculate the skew coefficient and kurtosis for the following data, giving a description of the frequency distribution curve (66,85,52,78,80,91,74,58).

H.W\\ Calculate the skew coefficient and kurtosis for the following data, giving a description of the frequency distribution curve (2,3,6,7,12,13,5,2,1).