

TOPIC



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Introduction

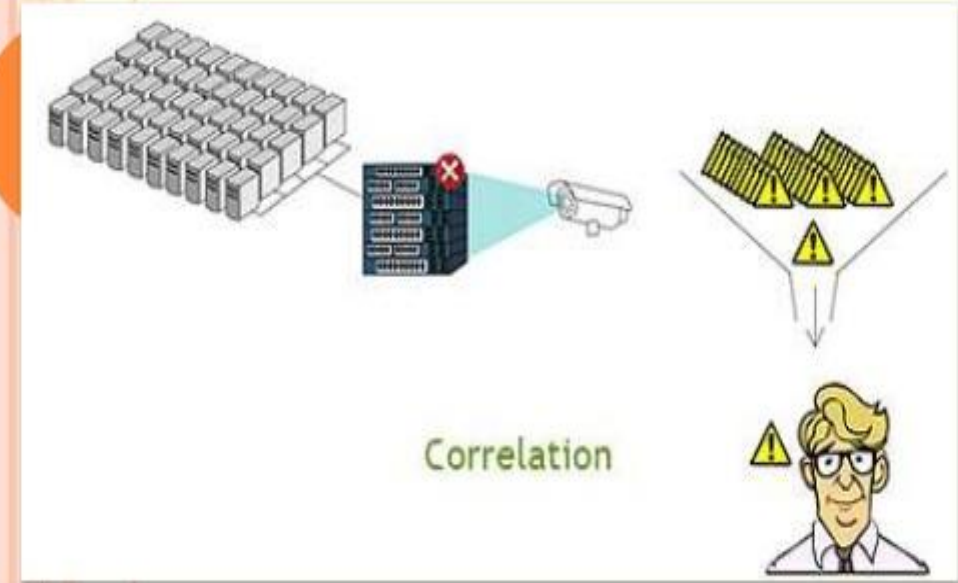
The word Correlation is made of **Co-** (meaning "together"), and **Relation**

One of the best statistical tests out there, in my opinion, is the correlation. Correlation is a mutual relationship between two variables.

Correlation analysis show us how to determine both the nature and strength of relationship between two variables.

DEFINITION

A correlation is a linear relationship between two variables. Correlation measures the linear association between two variables.



Types of correlation

On the basis of degree of correlation

- Positive correlation
- Negative correlation

On the basis of number of variables

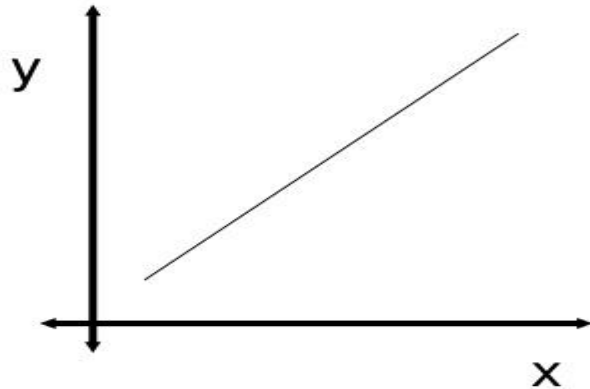
- Simple correlation
- Partial correlation
- Multiple correlation

On the basis of linearity

- Linear correlation
- Non – linear correlation

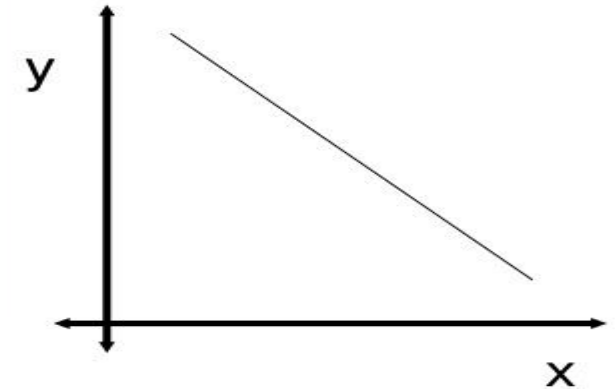
POSITIVE CORRELATION

It is a relationship between two variables where if one variable increases, the other one also increases. A positive correlation also exists in one decreases and the other also decreases.



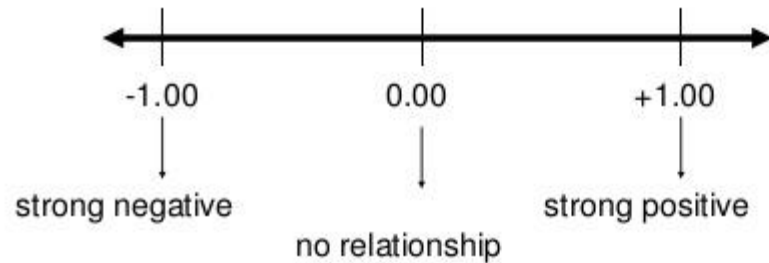
Negative Correlation

THAT MEANS THERE IS AN INVERSE RELATIONSHIP BETWEEN TWO VARIABLES - WHEN ONE VARIABLE DECREASES, THE OTHER INCREASES



CORRELATION COEFFICIENT

- The Coefficient of Correlation (r) is a measure of the strength of the linear relationship between two variables.
- A decimal number between .00 and +1.00 or -1.00 that indicates the degree to which two quantitative variables are related.



TYPES OF CORRELATION COEFFICIENT

1. Perfect *Positive correlation*
2. Perfect *negative correlation*
3. *Moderately* Positive correlation
4. *Moderate* negative correlation
5. Absolute *no correlation*

Limitations of Correlation

Although correlation is a powerful tool, there are some limitations in using it:

1. Correlation does not completely tell us everything about the data. Means and standard deviations continue to be important.
2. The data may be described by a curve more complicated than a straight line, but this will not show up in the calculation of r .
3. Just because two sets of data are correlated, it doesn't mean that one is the cause of the other.



Application

REAL LIFE Application Of Positive Correlation :

1. As the number of trees cut down increases, the probability of erosion increases.
2. As a student's study time increases, so does his test average.
3. As a child grows, so does his clothing size.
4. As her salary increased, so did her spending.

REAL LIFE Application Of Negative Correlation:

- student absences \uparrow ----- grades \downarrow
- weather cooling \uparrow ----- air conditioning costs \downarrow
- train speed \uparrow ----- length of final point \downarrow
- chicken age \uparrow ----- amount of eggs producing \downarrow

Application

Temperature \uparrow --- Sales Income \uparrow

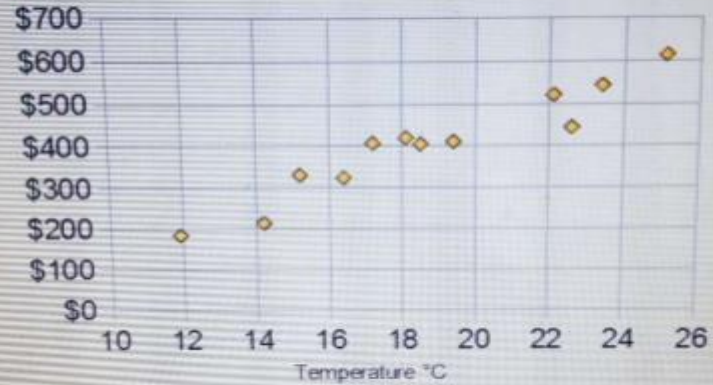


Temperature in °C

Temperature in °C	Sales
17.2 °C	\$408
22.6 °C	\$445
18.1 °C	\$421
23.4 °C	\$544
25.1 °C	\$614
19.4 °C	\$412
22.1 °C	\$522
18.5 °C	\$406
15.2 °C	\$332
11.9 °C	\$185
16.4 °C	\$325
14.2 °C	\$215

Application

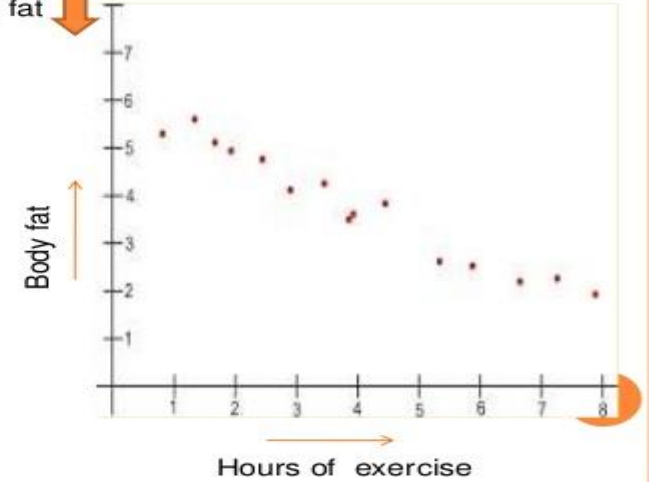
On a scatter plot, here is the same data:



So, we can see that more sales occur during warmer weather

Application

##amount of exercise ↑ --- % body fat ↓



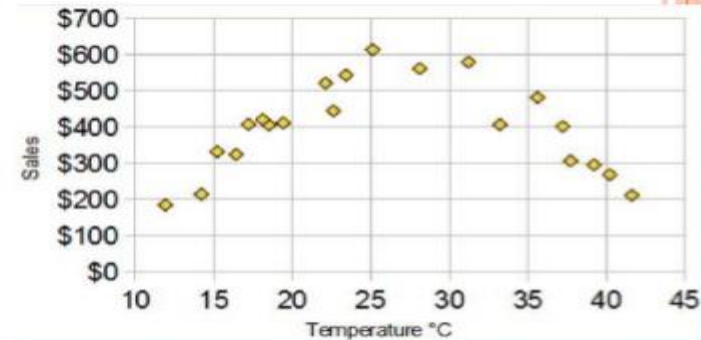
Application

Weather gets so hot--- sales start ↑



DRY, HOT AND SUNNY
SUMMER WEATHER

Here is the latest graph:



The correlation is now 0: "No Correlation" ... !

The End

Thank You

