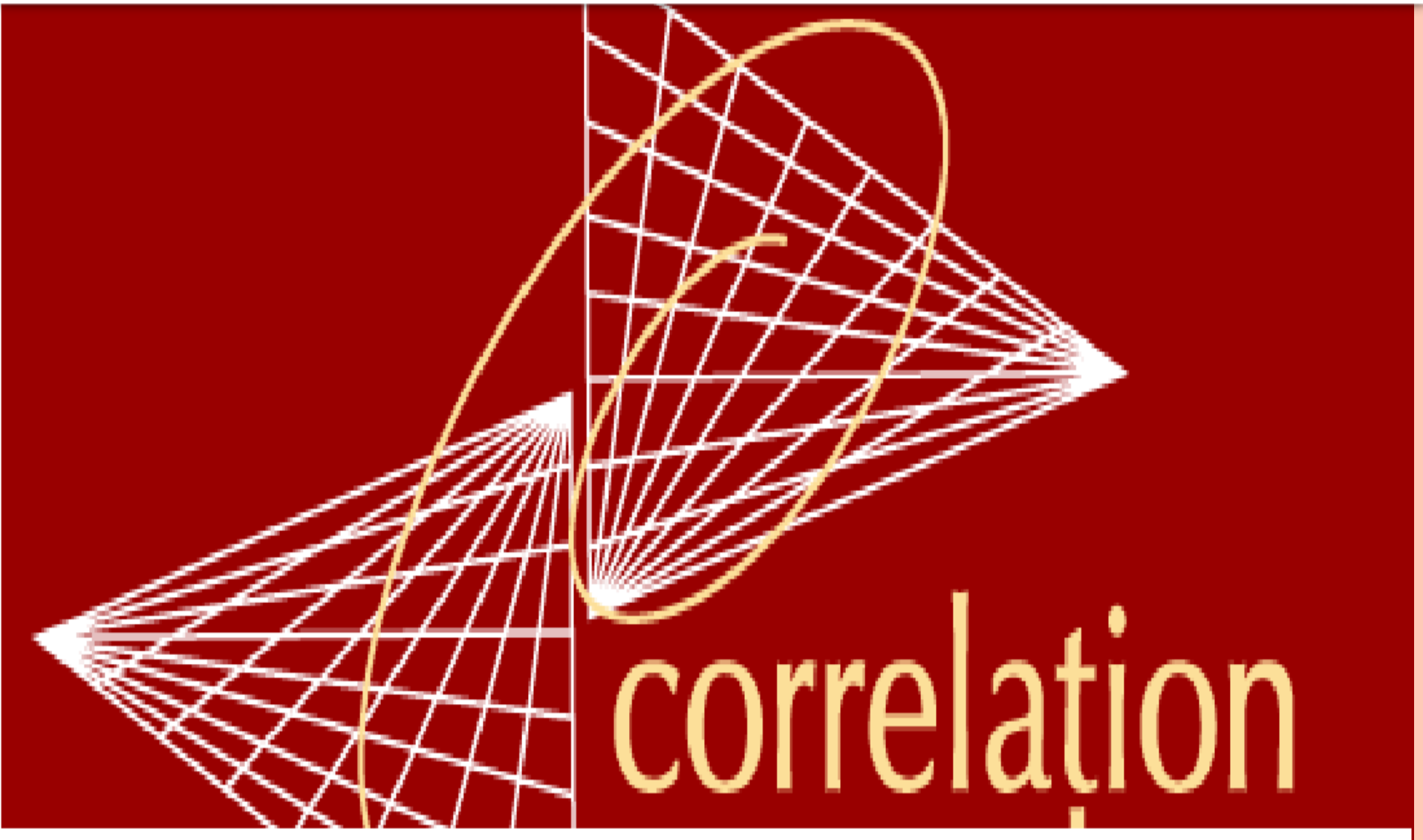

WELCOME

TOPIC



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Introduction

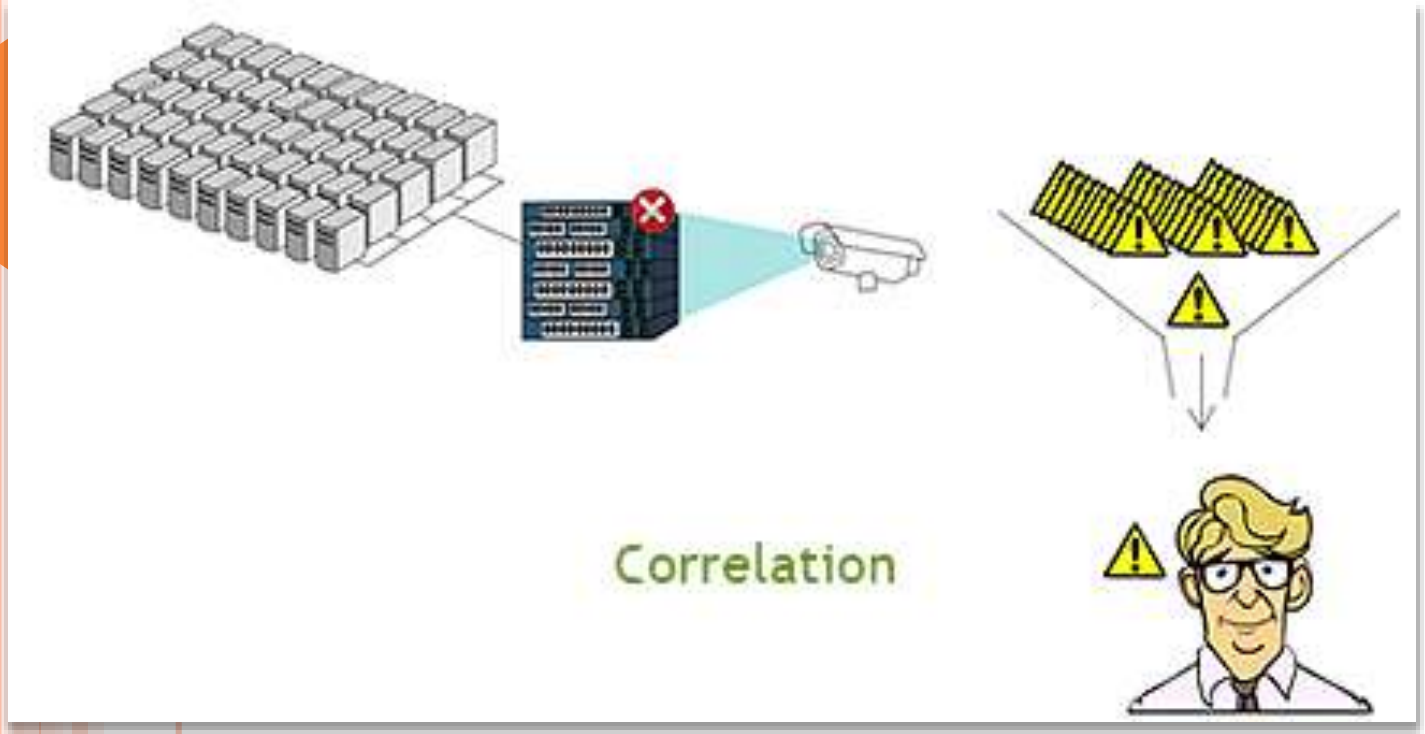
The word Correlation is made of **Co-** (meaning "together"), and **Relation**

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

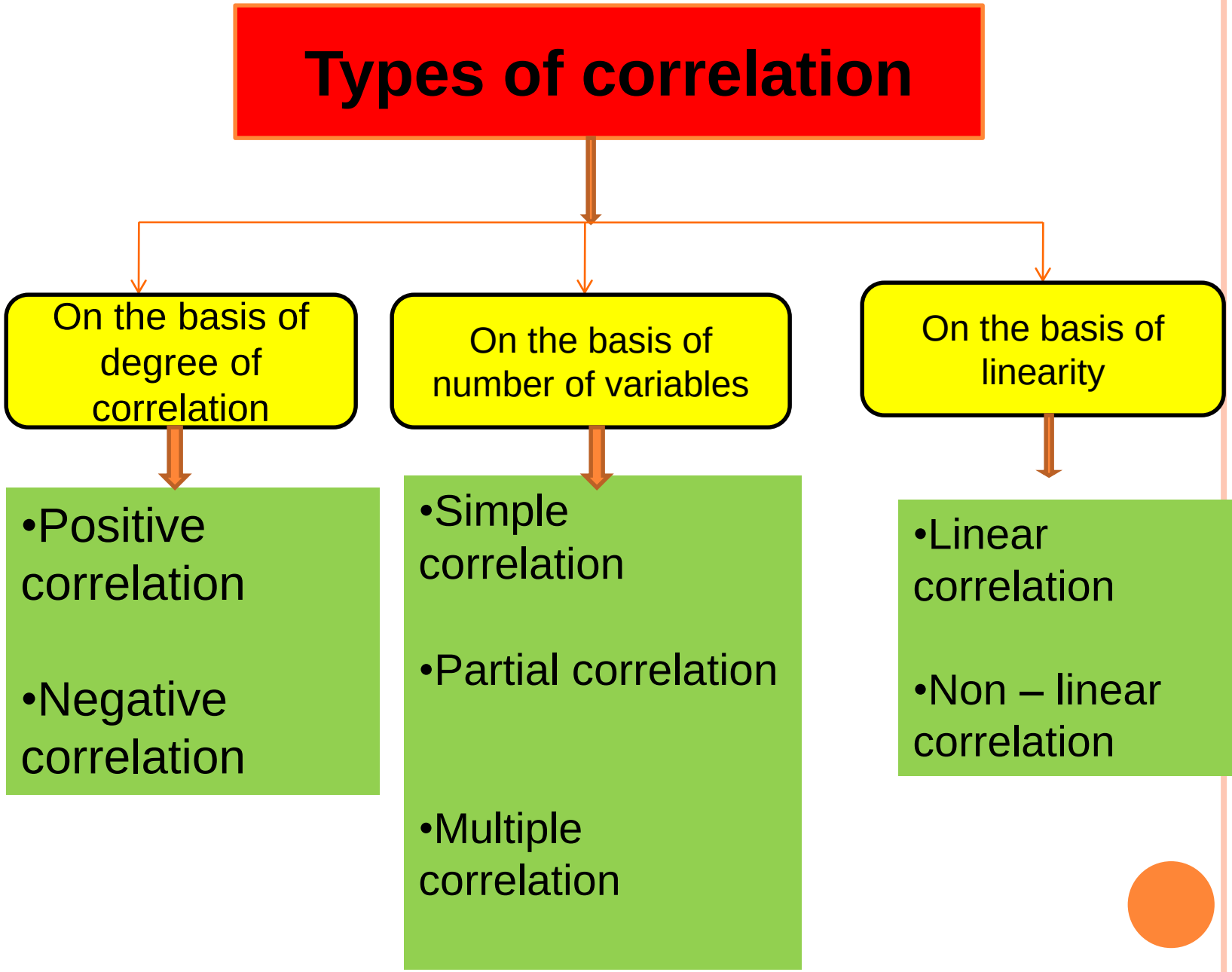
Correlation analysis show us how to determine both the nature and strength of relationship between two variables.

DEFINITION

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



Types of correlation



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.
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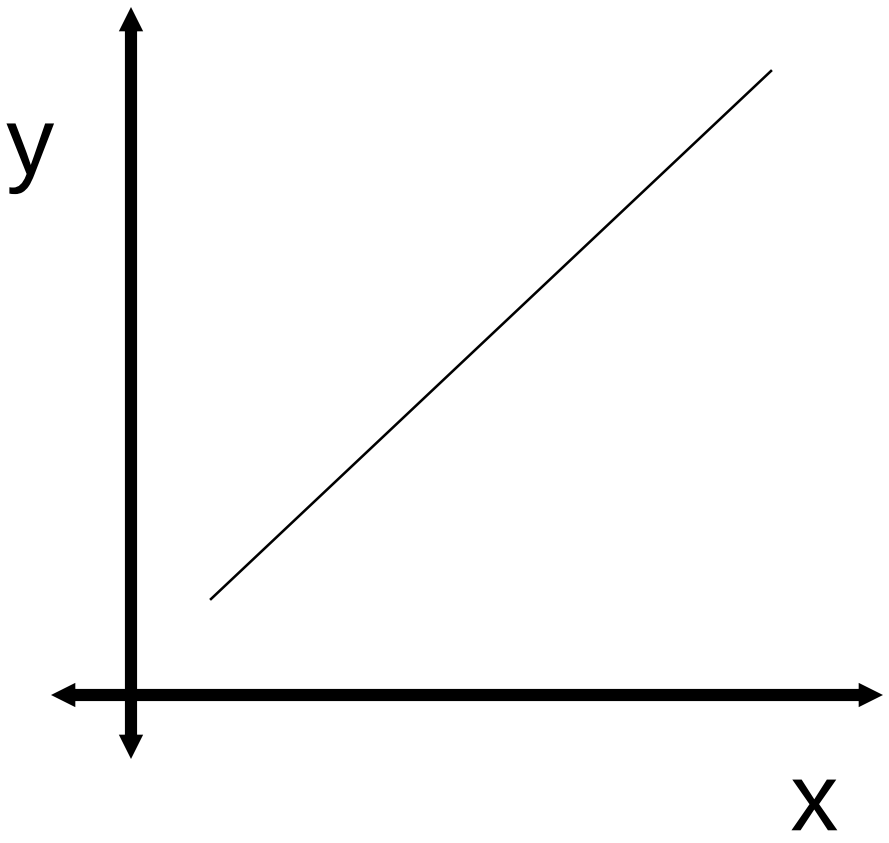
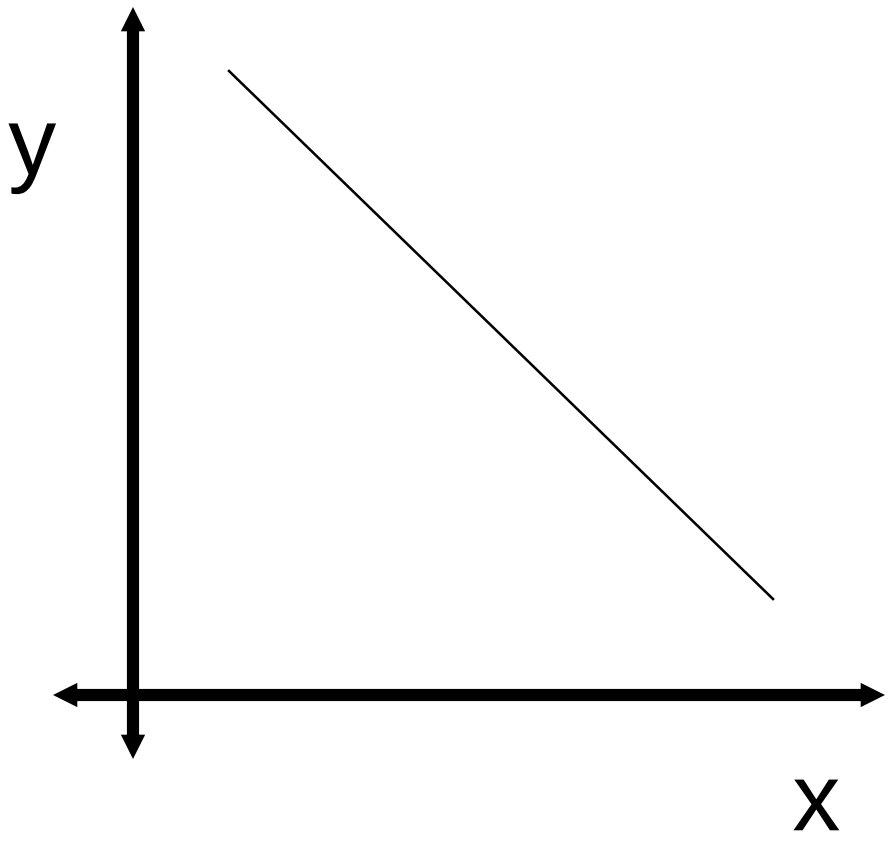


Negative Correlation

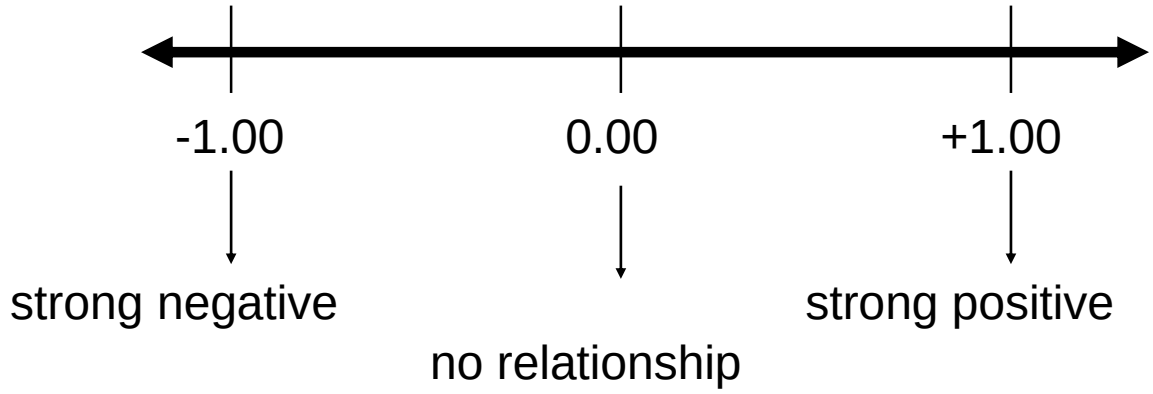
THAT MEANS THERE IS AN INVERSE RELATIONSHIP BETWEEN TWO VARIABLES - WHEN ONE VARIABLE DECREASES, THE OTHER INCREASES



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.

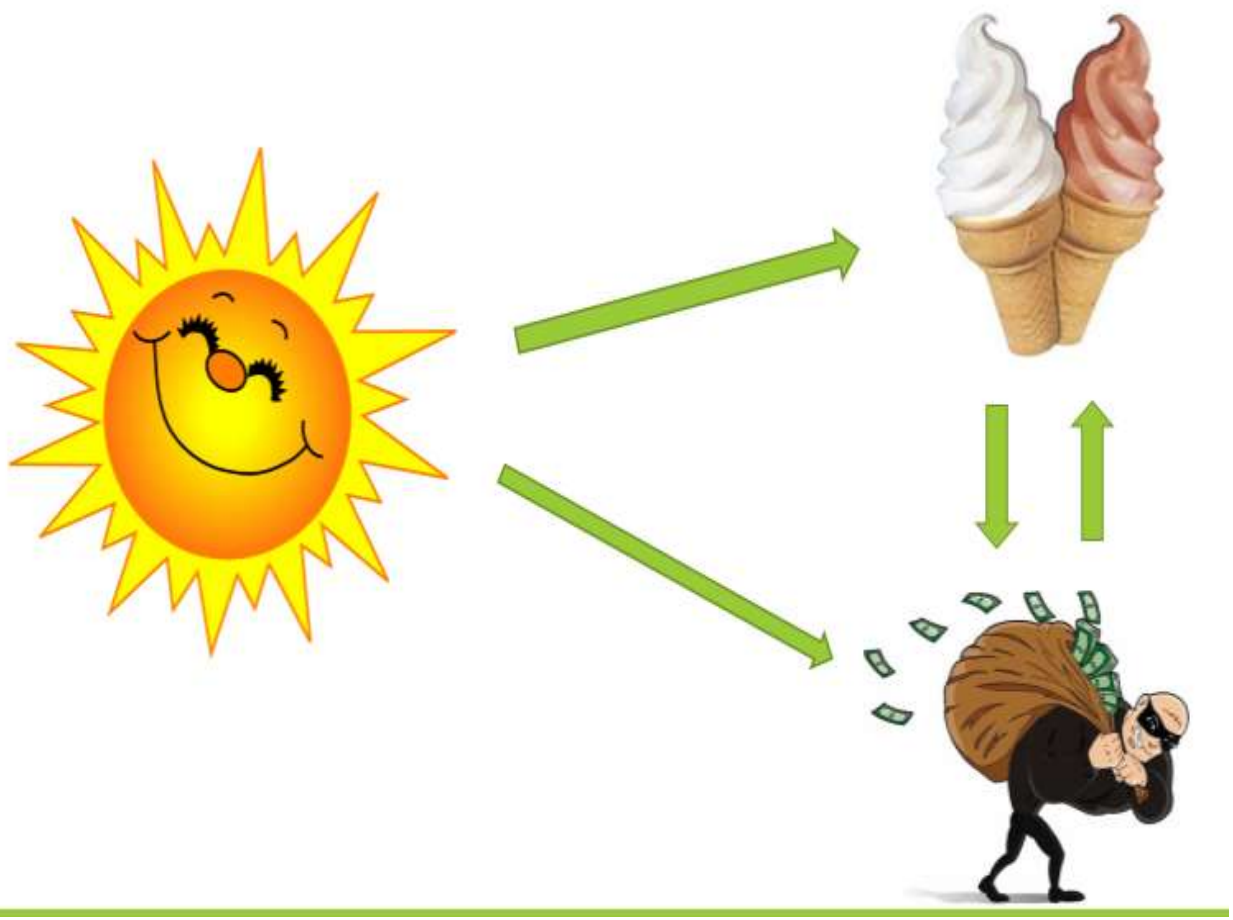
Application

REAL LIFE Application Of Negative Correlation:

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

Application

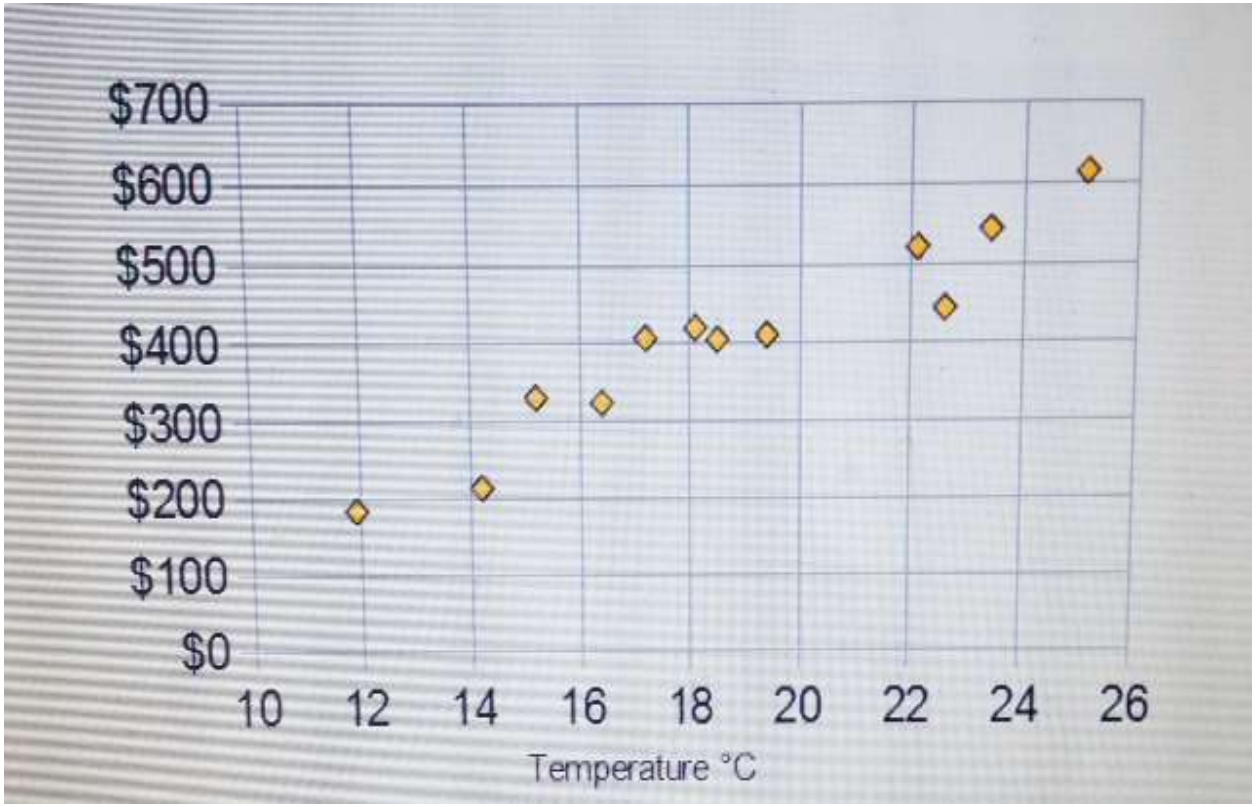
##Temperature ↑ --- Sales Income ↑



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

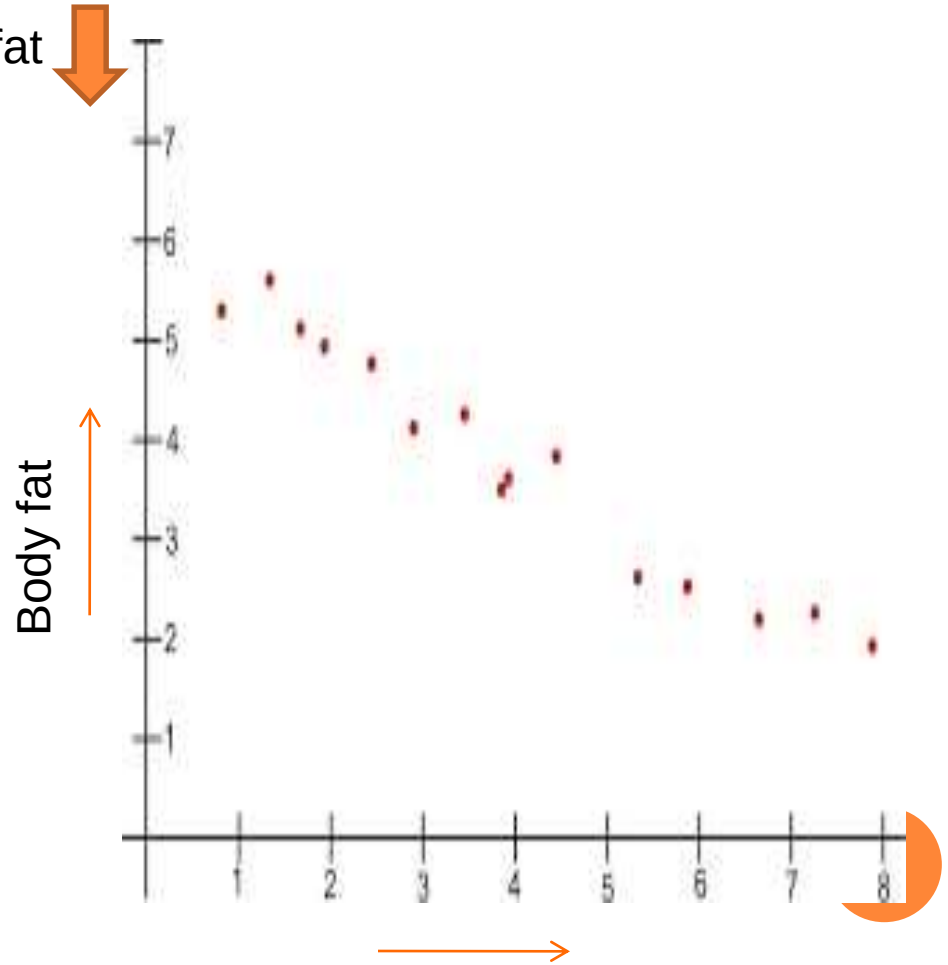
On a scatter plot, here is the same data:



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

Application

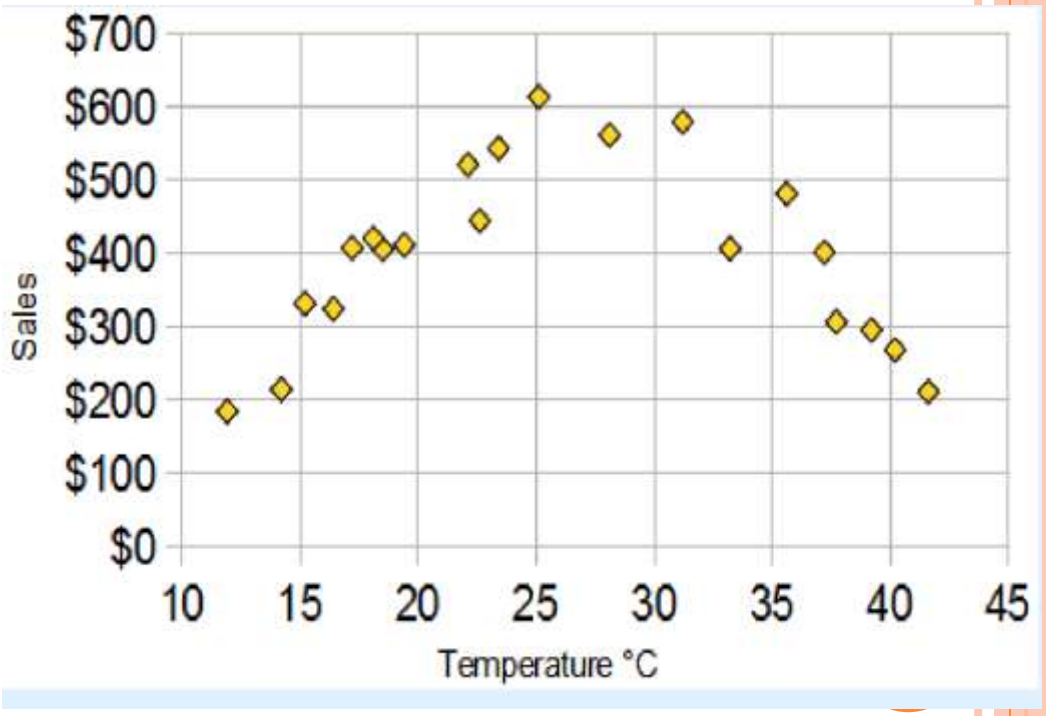
##amount of exercise ---- % body fat



Application

Weather gets so hot--- **sales start**

Here is the latest graph:



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

The End

Thank You