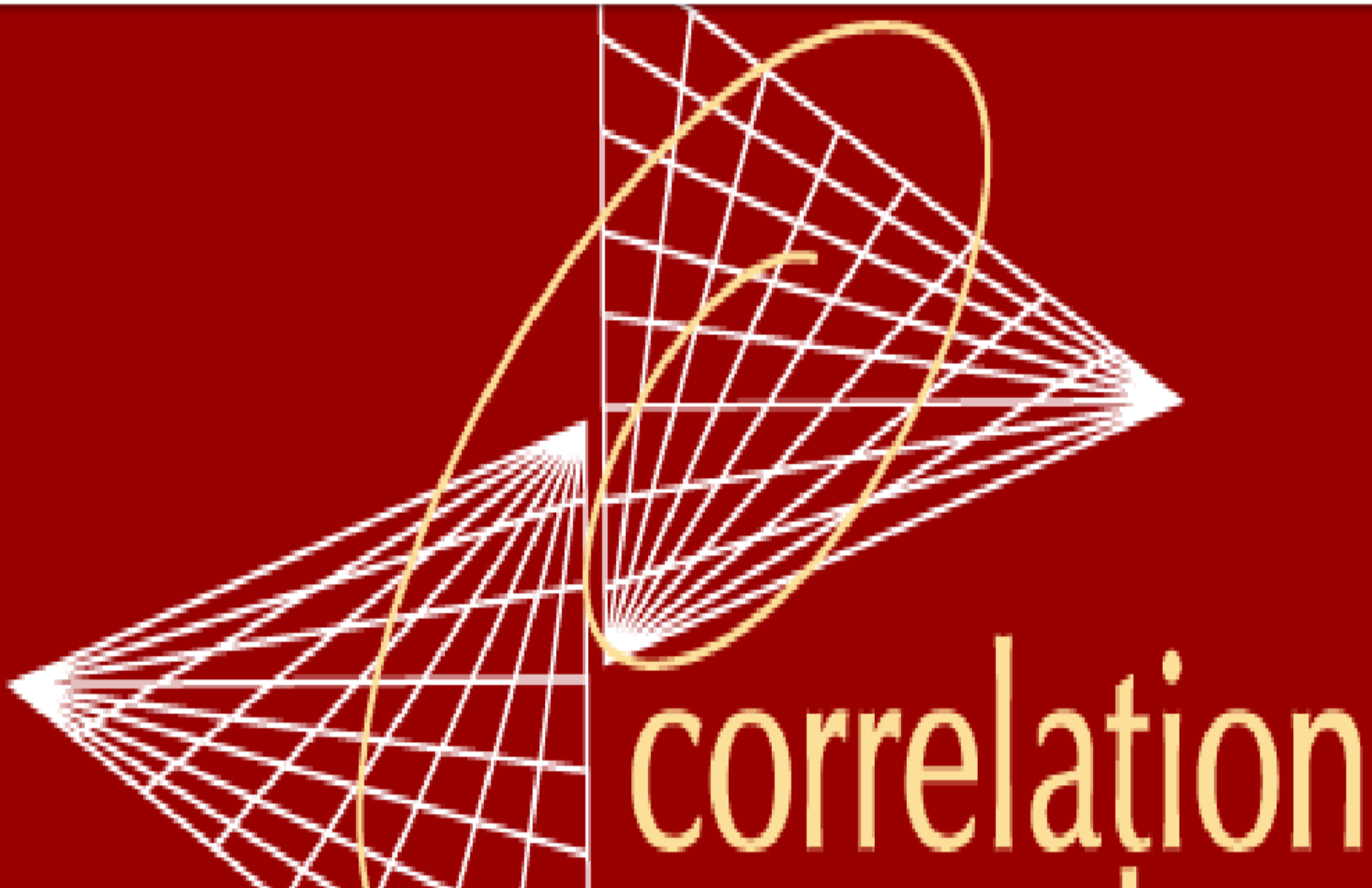


A collage of financial data including a line graph with values like 4010.0, 3880.0, 4253.0, and 3086.3; a stacked bar chart for months JAN through NOV with categories GAS, PL, and SIB; a table with columns DAT, BID, ASK, and PRO containing numerical values; and another line graph titled 'SALES BY C' with a legend for 'First' and 'Second' series. A magnifying glass is positioned over the ASK column of the table, and a pen lies diagonally across the bottom left.

WELCOME

TOPIC

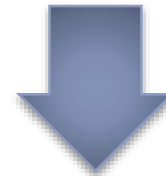


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Introduction

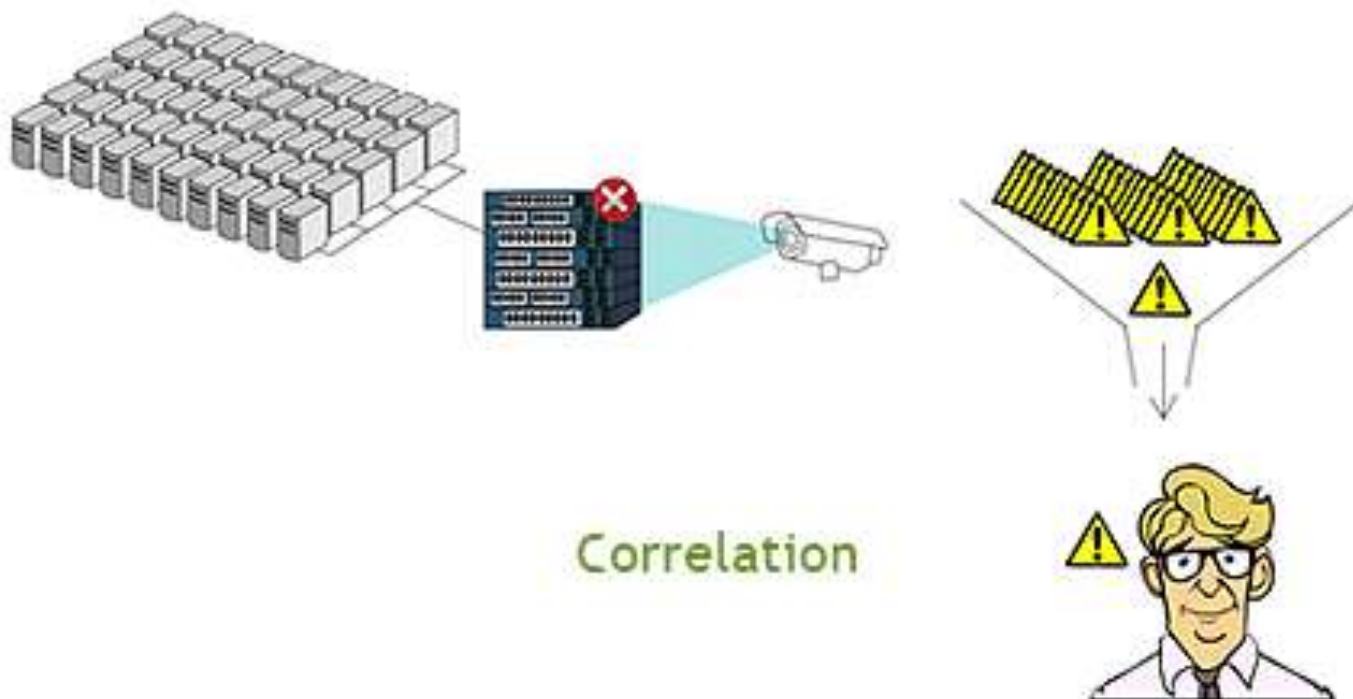
The word Correlation is made of **Co-** (meaning "together"), and **Relation**

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

```
graph TD; A[Types of correlation] --> B[On the basis of degree of correlation]; A --> C[On the basis of number of variables]; A --> D[On the basis of linearity]; B --> B1[•Positive correlation]; B --> B2[•Negative correlation]; C --> C1[•Simple correlation]; C --> C2[•Partial correlation]; C --> C3[•Multiple correlation]; D --> D1[•Linear correlation]; D --> D2[•Non – linear 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

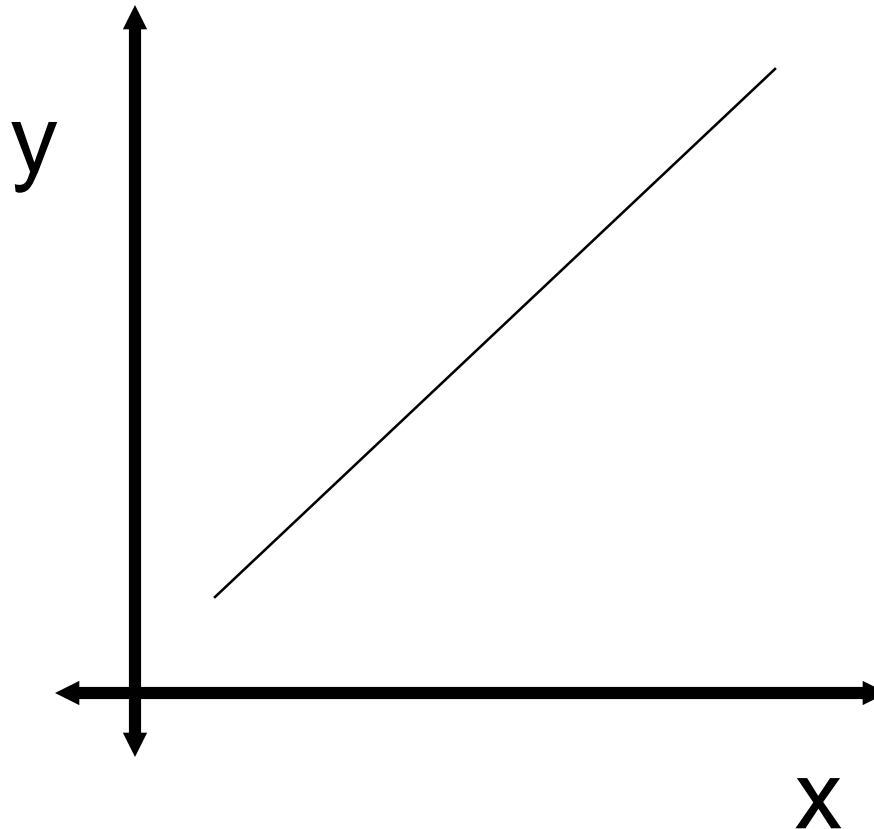
On the basis of
linearity

- Linear correlation
- Non – linear correlation



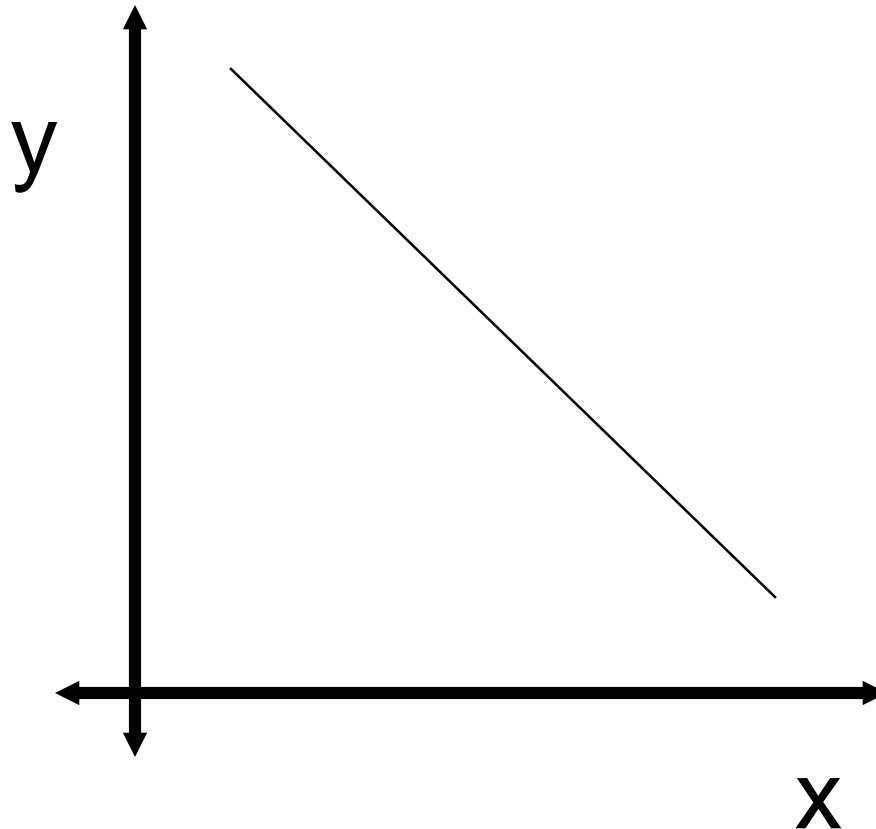
POSITIVE CORRELATION

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.



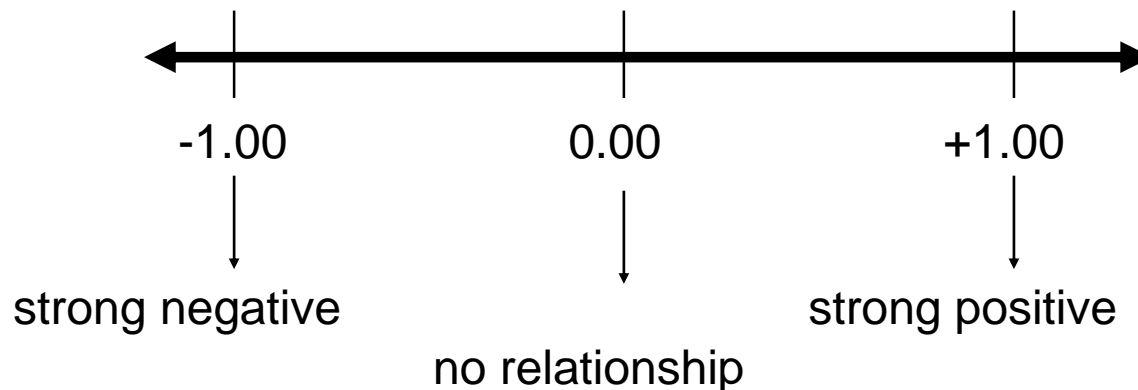
Negative Correlation

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.**



Application

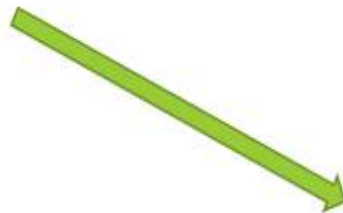
REAL LIFE Application Of Negative Correlation:

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



Application

##Temperature  --- Sales Income 

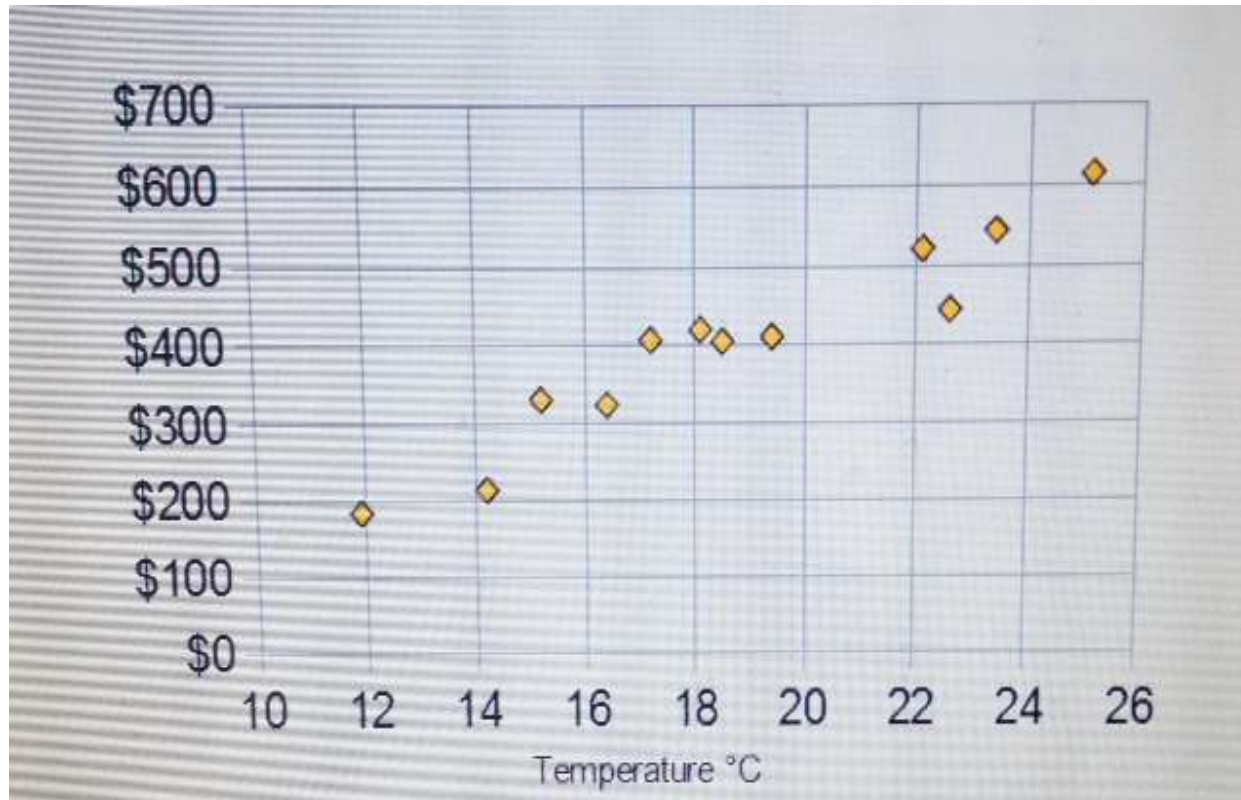


Temperature Sales
re in °C

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

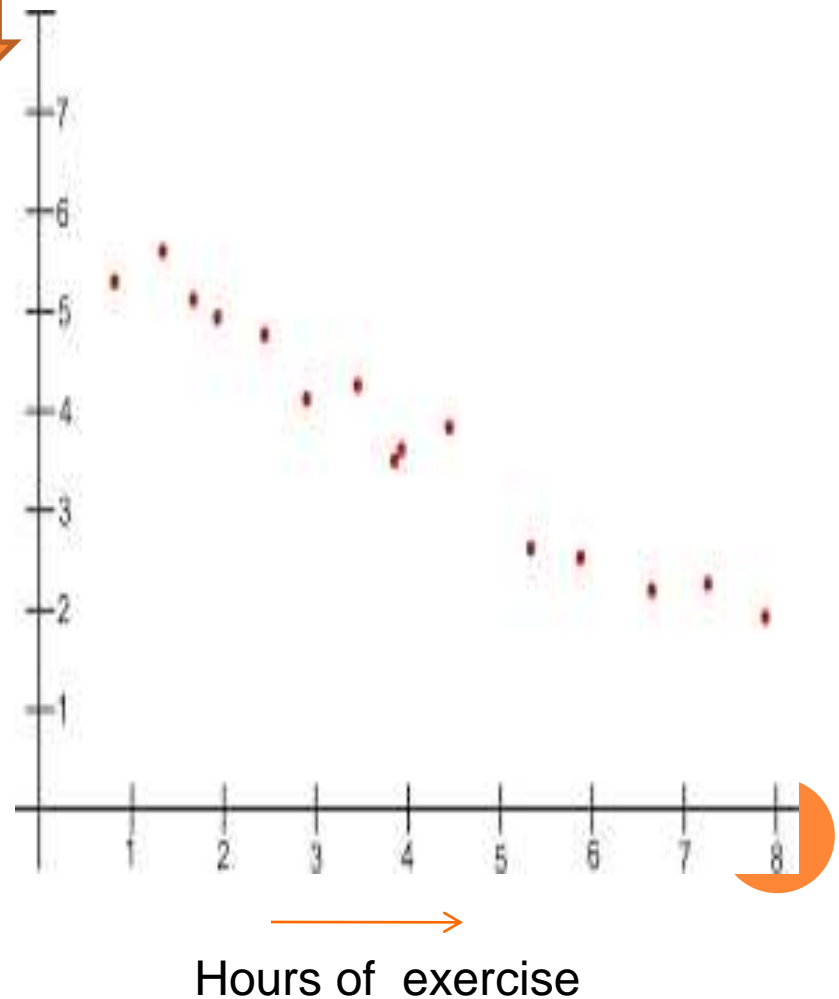


Application

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



Body fat



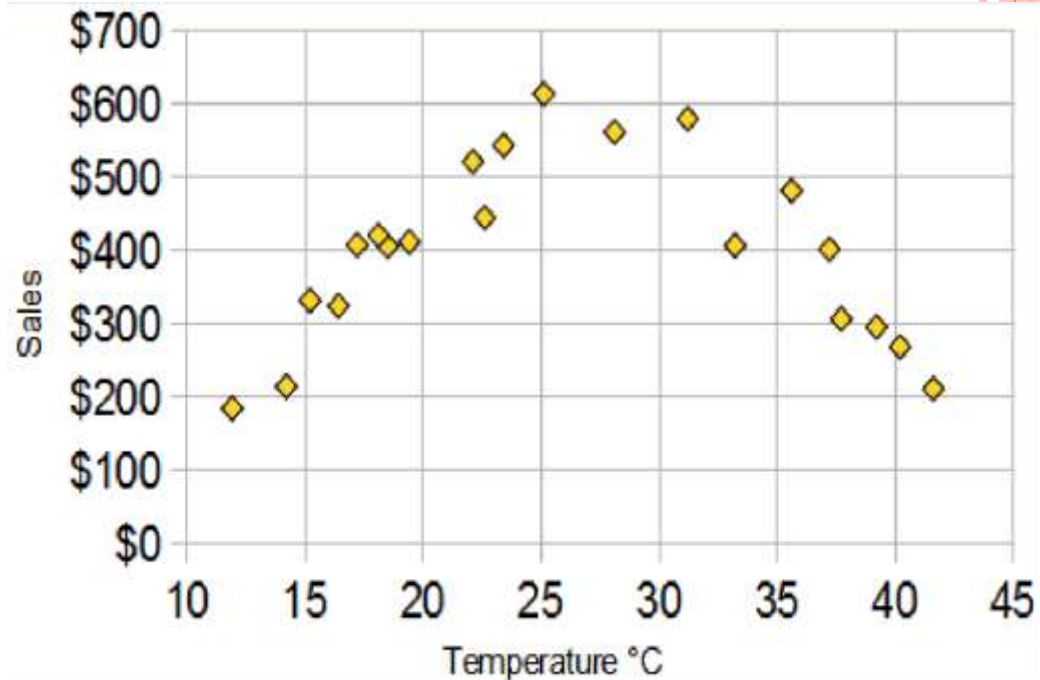
Application

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

