



# **CORRELATION COEFFICIENT**

## **DESCRIPTIVE STATISTICS**

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# TOPIC OUTLINE

## Correlation Coefficient



# CORRELATION COEFFICIENT



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Correlation coefficient adjusts covariance, so that the relationship between the two variables becomes easy and intuitive to interpret.

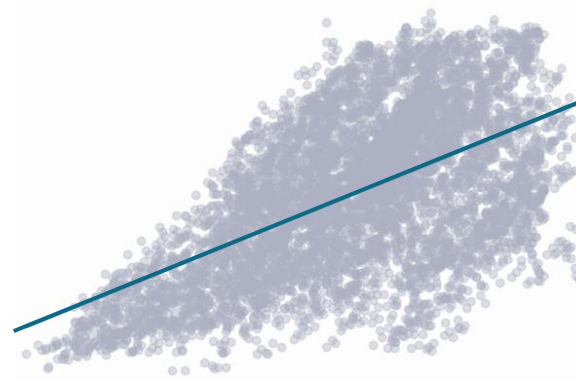
It ranges from  $-1$  to  $+1$ , where:

$+1$  indicates perfect positive correlation

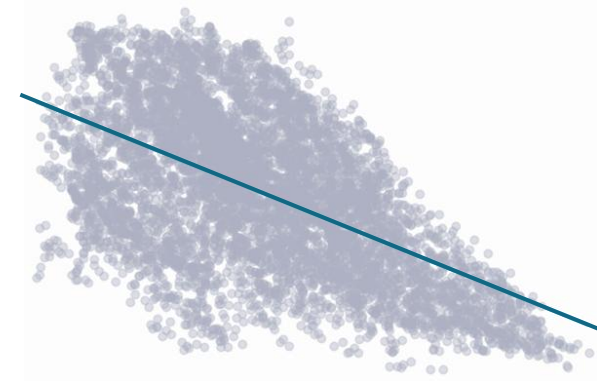
$-1$  indicates perfect negative correlation

$0$  indicates no linear relationship

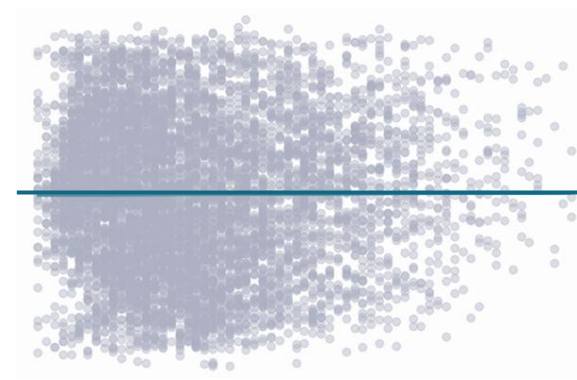
Scatter Plot:



**Correlation  $> 0$**



**Correlation  $< 0$**



**Correlation  $= 0$**



# CORRELATION COEFFICIENT

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**+1** indicates perfect positive correlation

**-1** indicates perfect negative correlation

**0** indicates no linear relationship

Population Correlation Coefficient:

$$r = \frac{\sigma_{xy}}{\sigma_x \sigma_y}$$

Sample Correlation Coefficient:

$$r = \frac{s_{xy}}{s_x s_y}$$



# EXERCISE

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Determine if each scenario suggests a positive, negative, or no correlation:

1. Ice cream sales and umbrella sales in a city.
2. Hours spent studying and exam scores.
3. A person's shoe size and their IQ.
4. Age of a used car and its resale value.



## EXERCISE

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The given dataset contains five observations of current (A) and corresponding power (W) measurements. Does **current** and **power** consumption have a positive, negative, or no linear relationship?

Solution:

Device	
Current	Power
2	100
3.5	200
1.8	90
4.2	210
2.7	110



# LABORATORY

