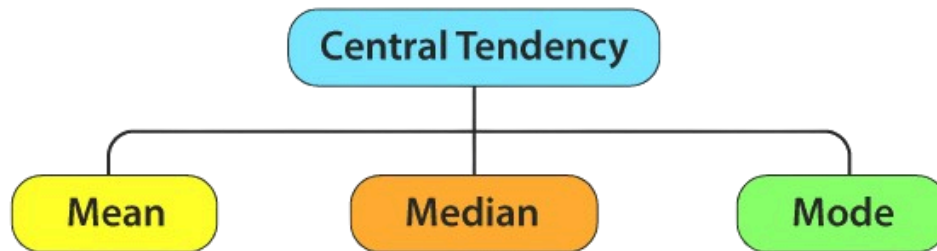
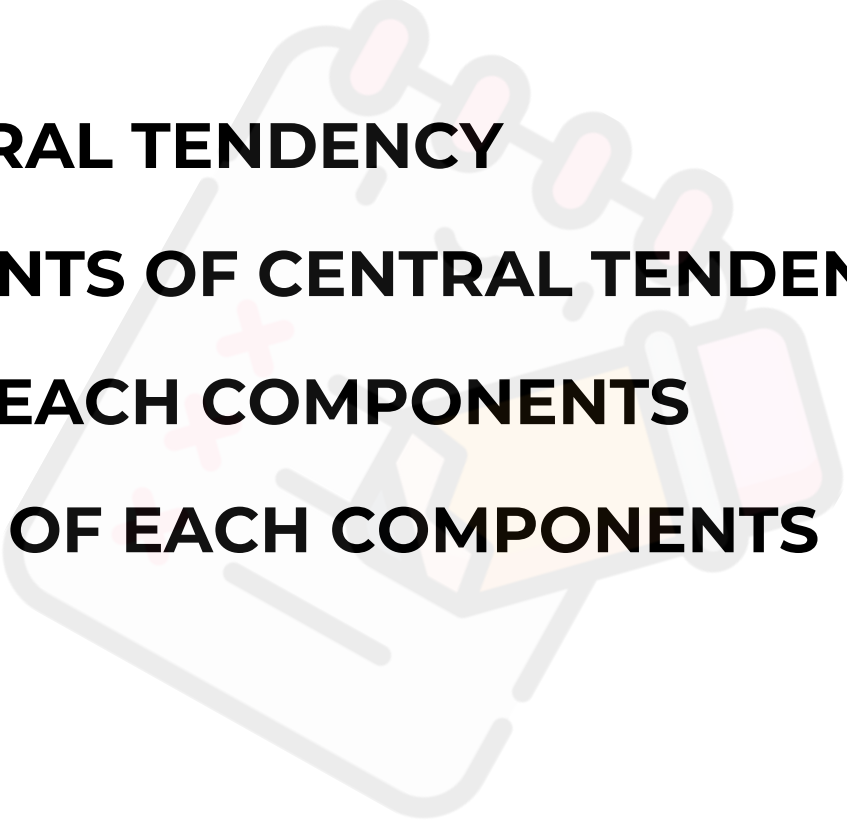



STATISTICS





Agenda

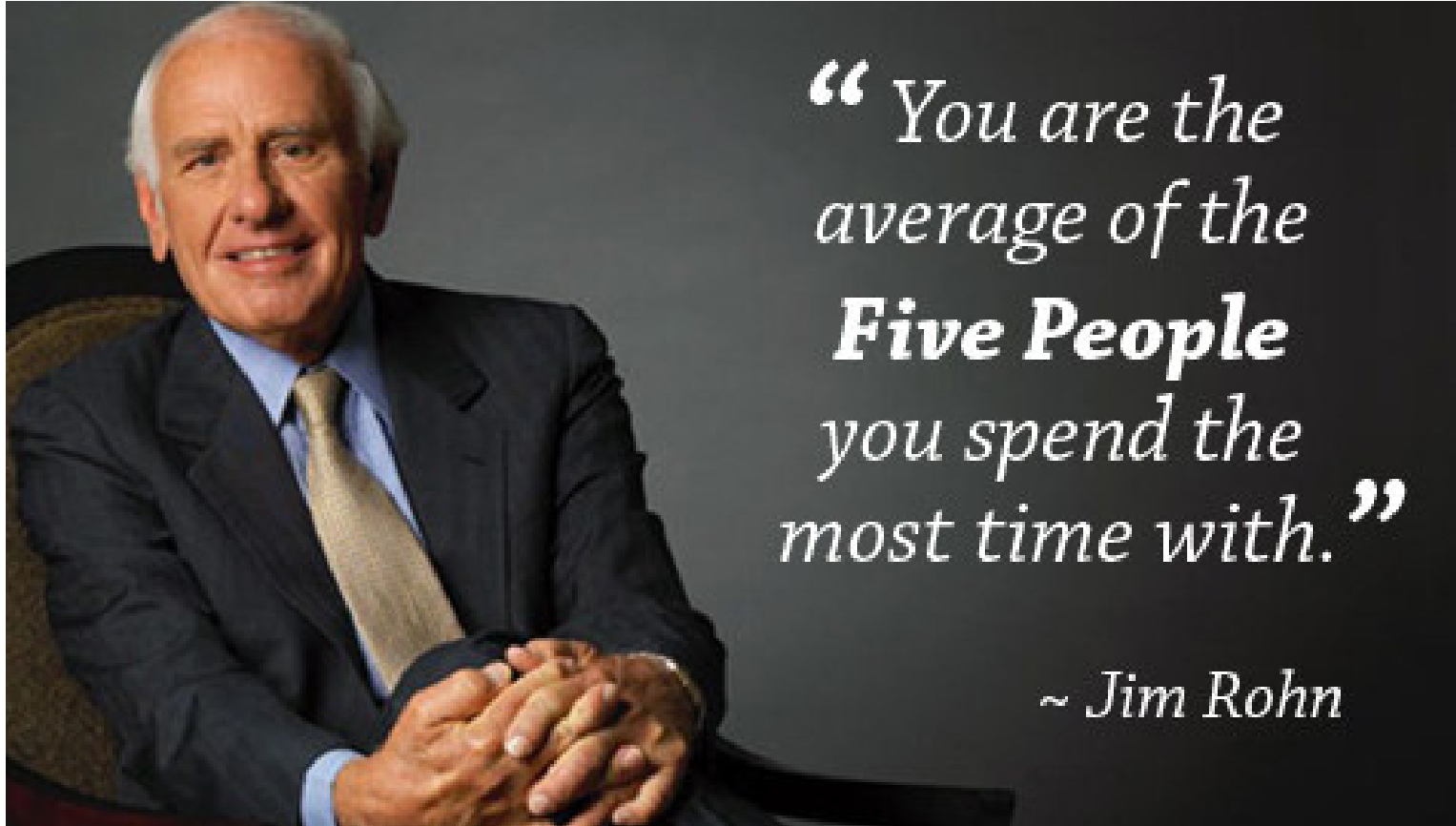
- **WHAT IS CENTRAL TENDENCY**
 - **KEY COMPONENTS OF CENTRAL TENDENCY**
 - **GET TO KNOW EACH COMPONENTS**
 - **APPLICATIONS OF EACH COMPONENTS**
- 
- 

WHAT

IS CENTRAL TENDENCY



- Central tendency is a statistical measure that identifies a **single value as representative of an entire distribution**.
- It aims to provide an accurate description of the entire data set with a single value that is the center point of the data.
- **Number crunching** perfectly encapsulates the process of calculating measures of central tendency. It involves **performing mathematical operations on a dataset to arrive at a single value** that represents the dataset's typical value.



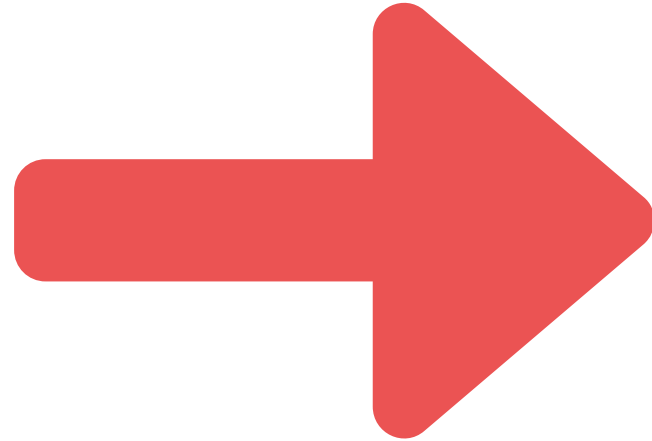
*“You are the
average of the
Five People
you spend the
most time with.”*

~ Jim Rohn

KEY COMPONENT



OF CENTRAL TENDENCY

- Mean
- Median
- Mode



MEAN

- Often referred to as the **average**, summarizes a set of data points by identifying their central value.
- It is calculated by adding up all the data points and then dividing by the number of data points.


$$\text{Average Formula} = \frac{\text{Total Sum of All Numbers}}{\text{Number of Item in the Set}}$$



CHARACTERISTICS OF MEAN

- **Sensitive to Outliers:** The mean can be greatly affected by extreme values (**outliers**) in the data set.
- Consider the Mean Salary of following group and think, is mean appropriate here ???



Data
Scientist



Senior
Analyst



Data
Engineer



Junior
Analyst

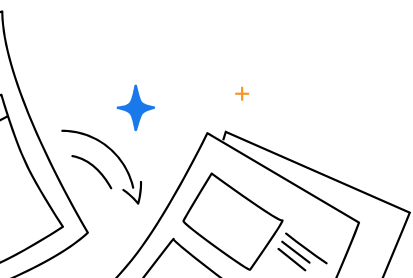


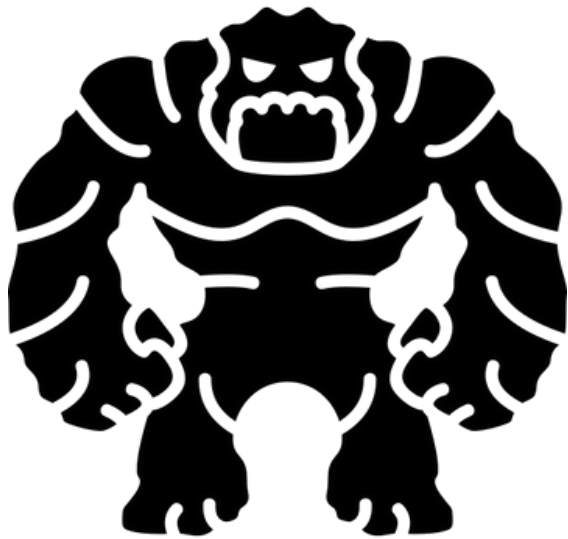
CEO
Meta Platforms



APPLICATION OF MEAN

- **Statistics and Data Analysis:** The mean is widely used in various fields such as economics, engineering, and social sciences to analyze data and draw conclusions.
- **Performance Metrics:** It helps in calculating average scores, average incomes, average sales, etc.
- **Comparative Studies:** Used to compare different data sets or groups to understand overall trends.





Outliers



Mean



Median

DON'T
WORRY
BRO I AM
HERE



MEDIAN

- Median is a measure of central that represents the middle value of a data set when it is **ordered from smallest to largest**.
- The median is particularly useful in understanding the distribution of data, especially **when the data set contains outliers or is skewed**.

- **if n is even,**

$$\text{median} = \frac{\left(\frac{n}{2}\right)^{\text{th}} + \left(\frac{n}{2} + 1\right)^{\text{th}}}{2}$$

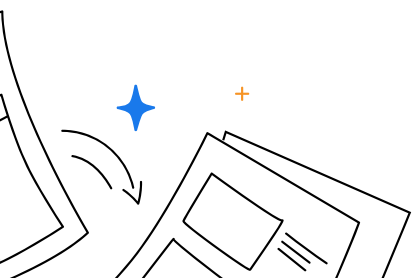
- **if n is odd,**

$$\text{median} = \left(\frac{n+1}{2}\right)^{\text{th}}$$



CHARACTERISTICS OF MEDIAN

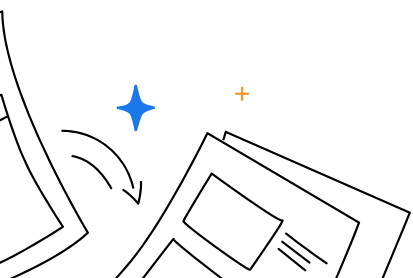
- **Resistant to Outliers:** Not affected by extreme values (outliers) in the data set. This makes it a **reliable measure** of central tendency for skewed distributions.
- **Useful for Ordinal Data:** The median can be used with ordinal data, where the values have a meaningful order but the distances between them are not necessarily equal.





APPLICATION OF MEDIAN

- **Income and Wealth Distributions:** The median is often used to report typical incomes or wealth levels, as it is not skewed by extremely high or low values.
- **Real Estate Prices:** Median home prices provide a better indication of the typical property value in an area compared to the mean, which can be influenced by very high or low prices.



MODE

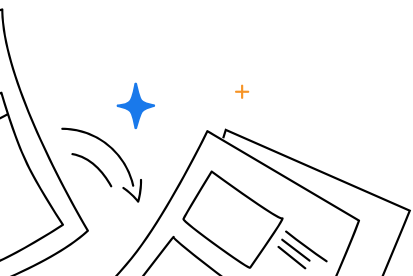


- Measure of central tendency that identifies the **most frequently occurring value(s)** in a data set.
- Mode provides a straightforward way to identify the **most common value in a data set**, offering insights into the most typical or popular items, responses, or categories.
- Unlike the mean and median, the **mode can have more than one value or none at all**, depending on the data set.



CHARACTERISTICS OF MODE

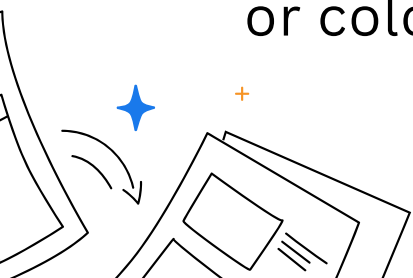
- **Only measure** of central tendency that can be used with **nominal data** (data that represents categories).
- **Resistant to Outliers:** Not affected by extreme values (outliers) in the data set.
- **Uniqueness :**
 1. UNIMODAL: A DATA SET WITH ONE MODE.
 2. BIMODAL: A DATA SET WITH TWO MODES.
 3. MULTIMODAL: A DATA SET WITH MORE THAN TWO MODES.
 4. NO MODE: A DATA SET WHERE NO VALUE REPEATS.





APPLICATION OF MODE

- **Market Research:** Identifying the most popular product or service.
- **Education:** Determining the most common grade or score on an exam.
- **Public Health:** Identifying the most frequently occurring health condition or symptom.
- **Retail:** Finding the most sold item or the most preferred size or color.



THANK YOU

**Share your thoughts and
feedback !!**

