In **Math and Statistics**, data is broadly classified based on its **nature**, **measurement scale**, and **structure**. Here's a clear breakdown:

### **✅ 1. Qualitative (Categorical) Data**

This type of data describes **qualities** or **characteristics**; it cannot be measured in numbers.

#### **a) Nominal Data**

* **Definition**: Categories with **no logical order**.
* **Examples**: Gender (Male/Female), Hair Color (Black, Brown, Blonde), City names.

#### **b) Ordinal Data**

* **Definition**: Categories with a **meaningful order**, but no fixed difference between values.
* **Examples**: Education Level (High School < Bachelor < Master), Ratings (Bad, Average, Good).

### **✅ 2. Quantitative (Numerical) Data**

This data represents measurable quantities and **can be expressed in numbers**.

#### **a) Discrete Data**

* **Definition**: Countable values; **no decimals**.
* **Examples**: Number of children, Test scores, Number of cars.

#### **b) Continuous Data**

* **Definition**: Can take **any value within a range**, including decimals.
* **Examples**: Height, Weight, Temperature, Time.

### **✅ 3. Measurement Scales (Levels of Measurement)**

This classification helps in understanding **how data can be analyzed**:

| **Level** | **Type** | **Description** | **Example** |
| --- | --- | --- | --- |
| **Nominal** | Qualitative | Labels without order | Hair color, Gender |
| **Ordinal** | Qualitative | Ordered categories | Survey ratings, Ranks |
| **Interval** | Quantitative | Ordered, no true zero | Temperature in Celsius |
| **Ratio** | Quantitative | Ordered, true zero exists | Height, Weight, Age |

### **✅ 4. Other Classifications**

#### **a) Cross-sectional Data**

* Collected at a **single point in time**.
* Example: Survey of salaries in June 2025.

#### **b) Time-series Data**

* Collected over **time intervals**.
* Example: Monthly sales data for 2023.

#### **c) Structured vs Unstructured Data**

* **Structured**: Tabular, rows & columns (e.g., Excel, SQL tables).
* **Unstructured**: Text, images, videos (e.g., tweets, videos, audio).