**Types of Data**

Diagram

Description automatically generated

It is divided into two broad categories, [qualitative data, and quantitative data](https://keydifferences.com/difference-between-qualitative-and-quantitative-data.html).

**Numerical (Quantitative):**

Continuous: you cannot put them inside a container, it always expands or shrinks, like age, weight, …

Discrete: you can put them in a container, they remain unchanged. They don’t expand or shrink, always the same. Like shoe size, num of children…

**Categorical(qualitative):**

Ordinal: they have a hierarchy. “Are you satisfied? -yes or no”, “What is your satisfaction rate? – good, average, bad? ”

Nominal: they don’t have a hierarchy, you can group them like “color of eyes”, “blood types” …

**Discrete and Continuous Data**

* A numerical variable is discrete if its possible values form a set of separate numbers, such as 0, 1, 2, 3, ...
* A numerical variable is continuous if its possible values form an interval.

**Ordinal and Nominal Data**

* An ordinal data is a categorical one for which the categories are ordered from low to high in some sense.
* A nominal data is a categorical data that do not have a natural order or ranking.

**Level of Measurements**

There are four different levels of measurements: nominal, ordinal, interval, or ratio.

### **Nominal Level of Measurement**

The nominal level simply names something without assigning an order.

Male/Female, Red/Blue/Yellow or Success/Fail classifications are examples for the nominal level of measurement.

* Nominal Level of Measurement simply names something without assigning an order.

A picture containing chart

Description automatically generated

### **Ordinal Level of Measurement**

In this level, the attributes are ordered, however, distances between attributes have no meaning. Remember the survey in the restaurant. In this measure, higher numbers mean more taste. But the distance from 1 to 2 might not be the same as 2 to 3. In the ordinal level of measurement, the interval between values is not interpretable.

* In the ordinal level, the attributes are ordered.
* But distances between attributes have no meaning.

Small-Medium-Large shirt classification is an example of the ordinal level of measurement.

A picture containing logo

Description automatically generated

### **Interval Level of Measurement**

Unlike the ordinal scale, in the interval level of measurement, the distance between attributes does have meaning.

For example, while measuring temperature, the distance between 40-50 degrees is the same as the distance between 60-70 degrees.

That means, it makes sense to calculate an average of an interval, where it doesn't work for ordinal scales.

However, in the interval level of measurement the **ratio** does not make any sense.

It is not possible to say that 100 degrees are twice as hot as 50 degrees.

### **Ratio Level of Measurement**

In this level, the observations, besides having the same intervals, also have a zero value.

Examples for this level of measurement include length, height, weight or cell phone charge capacity. Unlike the interval scales, ratios are meaningful. It is possible to say that one object has twice the height. Because having a zero-point makes it meaningful.

The following picture shows the level of measurements and the hierarchy between them.

Diagram

Description automatically generated