

# WHAT IS STATISTICS?

## (Part 2)



What is a *parameter*?

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A *parameter* is a numerical measurement describing some characteristic of a population.

What is a *statistic*?

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A *statistic* is a numerical measurement describing some characteristic of a sample.

What is *quantitative data*?

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**Example:** The heights of students in a classroom give us *numerical data*. We can, thus, compute things such as the difference between two heights or an average height.



What is *categorical data*?

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**Example:** The names of students in a classroom give us *nonnumerical (categorical) data*. Thus, questions such as, “What is *Bob minus Fred*?” are meaningless.

What is *discrete data*?

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**Example:** The number of students in a classroom is *discrete*. You can have 5 students or you can have 6 students, but you can't have  $5 \frac{1}{2}$  students in class.

What is *continuous data*?

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**Example:** The heights of students in a classroom is *continuous*. Between any two height values it's always theoretically possible for someone to have a height that's in between. Possible height values exist along a continuum.

What is *the nominal level of measurement*?

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**Example:** If we collect information only on the type of cell phone a person has (I,e, Verizon, Blackberry, Android, iPhone, etc.), then we will have *nominal data*.

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**Example:** If we collect information on the “star” rating of restaurants, then we will have *ordinal data*.

What is *the ordinal level of measurement*?

Data are at *the ordinal level of measurement* if the context provides a natural order to the data, but differences between data values either cannot be determined or are meaningless.

**Example:** Another example of *ordinal data* is percentile ranking on a standardized test like the *SAT*.



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**Example:** A standard example of *interval data* is temperature measured in degrees Fahrenheit. For example, it takes the same amount of energy to raise the temperature from 50° to 60° as it does from 80° to 90°, but we can't say that 60° is twice as hot as 30° since we aren't measuring temperature with respect to an absolute zero.

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**Example:** If we measure temperature in *Kelvins*, then we have *ratio data* since an absolute zero point of reference exists. Thus, it does make sense to say that *60 Kelvins* is twice as hot as *30 Kelvins*.

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**Example:** More common examples of *ratio data* would be height and weight. Since each of those scales has an absolute zero, it makes sense to say that one person is twice as tall as another or weighs twice as much as another.

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*The ratio level of measurement* is like the interval level with the addition that an absolute zero point exists. Consequently, with respect to this absolute zero point, we can talk in terms of one data element being twice as large as another data element.

**NOTE:** Both *interval data* and *ratio data* must be numerical data.