



[My Programs](#) ▶ ... ▶ [Descriptive Statistics - Part I](#) ▶ Text + Quiz: Data Types (Ordinal vs. Nominal)

## Text + Quiz: Data Types (Ordinal vs. Nominal)

### Recap of Previous Video

The table below summarizes our data types. To expand on the information in the table, you can look through the text that follows.

Data Types		
Quantitative:	Continuous	Discrete
	Height, Age, Income	Pages in a Book, Trees in Yard, Dogs at a Coffee Shop
Categorical:	Ordinal	Nominal
	Letter Grade, Survey Rating	Gender, Marital Status, Breakfast Items

Below is a little more detail of the information shared in the above table.

### Another Look

To break down our data types, there are two main blocks:

#### Quantitative and Categorical

**Quantitative** can be further divided into **Continuous** or **Discrete**.

**Categorical** data can be divided into **Ordinal** or **Nominal**.

You should have now mastered what types of data in the world around us falls into each of these four buckets: Discrete, Continuous, Nominal, and Ordinal. In the next sections, we will work through the numeric summaries that relate specifically to quantitative variables.

### Quantitative vs. Categorical

Some of these can be a bit tricky - notice even though zip codes are a number, they aren't really a quantitative variable. If we add two zip codes together, we do not obtain any useful information from this new value. Therefore, this is a categorical variable.

**Height, Age, the Number of Pages in a Book and Annual Income** all take on values that we can add, subtract and perform other operations with to gain useful insight. Hence,

these are **quantitative**.

**Gender, Letter Grade, Breakfast Type, Marital Status, and Zip Code** can be thought of as labels for a group of items or individuals. Hence, these are **categorical**.

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## Continuous vs. Discrete

To consider if we have continuous or discrete data, we should see if we can split our data into smaller and smaller units. Consider time - we could measure an event in years, months, days, hours, minutes, or seconds, and even at seconds we know there are smaller units we could measure time in. Therefore, we know this data type is continuous.

**Height, age, and income** are all examples of **continuous data**. Alternatively, the **number of pages in a book, dogs I count outside a coffee shop, or trees in a yard** are **discrete data**. We would not want to split our dogs in half.

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## Ordinal vs. Nominal

In looking at categorical variables, we found **Gender, Marital Status, Zip Code** and your **Breakfast items** are **nominal variables** where there is no order ranking associated with this type of data. Whether you ate cereal, toast, eggs, or only coffee for breakfast; there is no rank ordering associated with your breakfast.

Alternatively, the **Letter Grade** or **Survey Ratings** have a rank ordering associated with it, as **ordinal data**. If you receive an A, this is higher than an A-. An A- is ranked higher than a B+, and so on... Ordinal variables frequently occur on rating scales from very poor to very good. In many cases we turn these ordinal variables into numbers, as we can more easily analyze them, but more on this later!

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## Final Words

In this section, we looked at the different data types we might work with in the world around us. When we work with data in the real world, it might not be very clean - sometimes there are typos or missing values. When this is the case, simply having some expertise regarding the data and knowing the data type can assist in our ability to 'clean' this data. Understanding data types can also assist in our ability to build visuals to best explain the data. But more on this very soon!

### Quiz Question

This quiz will assure you have a clear understanding of the differences between categorical nominal vs. categorical ordinal variables. All of the variables below are categorical. Your task is to select the **check** box next to each variable that is **nominal**; do not check the ordinal categorical variables.

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☐ Letter Grades (A, B+, B, B-, etc.)

- ☐ Types of Fruit (Apple, Banana, etc.)
- ☐ Ratings on a Survey (Poor, Ok, Great)
- ☐ Types of Dog Breeds (German Shepherd, Collie, etc.)
- ☐ Genres of Movies (Horror, Comedy, etc.)
- ☐ Gender
- ☐ Nationality
- ☐ Education (HS, Associates, Bachelors, Masters, PhD, etc.)

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