What are the definitions and examples of categorical and quantitative variables?

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Categorical and quantitative variables are two types of variables commonly used in statistical analysis. A categorical variable is a type of data that can be divided into distinct categories or groups, and cannot be measured on a numerical scale. Examples of categorical variables include gender, race, and type of occupation. On the other hand, a quantitative variable is a type of data that can be measured on a numerical scale. It is used to represent quantities or amounts and can be further divided into discrete or continuous variables. Examples of quantitative variables include age, weight, and income. In summary, categorical variables are used to classify data into distinct groups, while quantitative variables are used to measure numerical values.

Categorical vs. Quantitative Variables: Definition + Examples

In statistics, variables can be classified as either categorical or quantitative.

Categorical Variables: Variables that take on names or labels. Examples include:

Marital status ("married", "single", "divorced")Smoking status ("smoker", "non-smoker")Eye color ("blue", "green", "hazel")Level of education (e.g. "high school", "Bachelor's degree", "Master's degree")

Quantitative Variables: Variables that take on numerical values. Examples include:

Height of an individualPopulation size of a cityNumber of students in a classNumber of square feet in a house

The following table summarizes the difference between these two types of variables:

	Categorical	Quantitative
Definition	*Take on names or labels*	*Take on numeric values*
Examples	Marital Status	Height
	Smoking Status	Population Size
	Eye Color	Square Footage
	Level of Education	Class Size

Examples: Categorical vs. Quantitative Variables

Use the following examples to gain a better understanding of categorical vs. quantitative variables.

Example 1: Plant Height

A botanist walks around a local forest and measures the height of a certain species of plant. The variable plant height is a quantitative variable because it takes on numerical values. For example, the height could be 15 inches, 17.5 inches, 19.2 inches, etc.

Example 2: Vacation Locations

A researcher surveys 200 people and asks them about

their favorite vacation location. The variable vacation location is a categorical variable because it takes on names. For example, responses could include "Miami", "San Francisco", "Hilton Head", etc.

Example 3: Political Party

A political scientists surveys 50 people in a certain town and asks them which political party they identify with. The variable political party is a categorical variable because it takes on labels. For example, responses could include "Democrat", "Republican", "Independent", etc.

Example 4: Running Times

A coach records the running times of his 20 track runners. The variable running time is a quantitative variable because it takes on numerical values. For example, running time could be 58 seconds, 60.343 seconds, 65.4 seconds, etc.

An economist collects data about house prices in a certain city. The variable house price is a quantitative variable because it takes on numerical values. For

example, house price could be $149,000, $289,000, $560,000, etc.

How to Describe Categorical & Quantitative Variables

We can summarize categorical variables by using frequency tables.

For example, suppose we collect data on the eye color of 100 individuals. Since "eye color" is a categorical variable, we might use the following frequency table to summarize its values:

Eye Color	Frequency
Green	40
Blue	25
Hazel	35

We can summarize quantitative variables using a variety of descriptive statistics.

For example, suppose we collect data on the square footage of 100 homes. Since "square footage" is a quantitative variable, we might use the following descriptive statistics to summarize its values:

Mean: 1,800Median: 2,150Mode: 1,600Range: 6,500Interquartile Range: 890Standard Deviation: 235

These metrics give us an idea of where the is located as well as how the values are for this variable.