**Continuous Variables**

A variable is a quantity that has a changing value; the value can vary from one example to the next. A continuous variable is a variable that has an infinite number of possible values. In other words, any value is possible for the variable. A continuous variable is the opposite of a discrete variable, which can only take on a certain number of values. A continuous variable doesn’t have to have every possible number (like -infinity to +infinity), it can also be continuous between two numbers, like 1 and 2. For example, discrete variables could be 1,2 while the continuous variables could be 1,2 and everything in between: 1.00, 1.01, 1.001, 1.0001…

**Examples of continuous variables:** (Heights, weights are examples of continuous variables)

* Time it takes a computer to complete a task. You might think you can count it, but time is often rounded up to convenient intervals, like seconds or milliseconds. Time is actually a continuum: it could take 1.3 seconds or it could take 1.333333333333333… seconds.
* A person’s weight. Someone could weigh 180 pounds, they could weigh 180.10 pounds or they could weigh 180.1110 pounds. The number of possibilities for weight are limitless.
* Income. You might think that income is countable (because it’s in dollars) but who is to say someone can’t have an income of a billion dollars a year? Two billion? Fifty nine trillion? And so on…
* Age. So, you’re 25 years-old. Are you sure? How about 25 years, 19 days and a millisecond or two? Like time, age can take on an infinite number of possibilities and so it’s a continuous variable.
* The price of gas. Sure, it might be $4 a gallon. But one time in recent history it was 99 cents. And give inflation a few years it will be $99. not to mention the gas stations always like to use fractions (i.e. gas is rarely $4.47 a gallon, you’ll see in the small print it’s actually $4.47 9/10ths

**Discrete Variables**

A variable is a quantity that has changing values. A discrete variable is a variable that can only take on a certain number of values. In other words, they don’t have an infinite number of values. If you can count a set of items, then it’s a discrete variable. The opposite of a discrete variable is a continuous variable. Continuous variables can take on an infinite number of possibilities.

**Examples of discrete variables:**

* Number of quarters in a purse, jar, or bank. Discrete because there can only be a certain number of coins (1,2,3,4,5…). Coins don’t come in amounts of 2.3 coins or 10 1/2 coins, so it isn’t possible for there to be an infinite number of possibilities. In addition, a purse or even a bank is restricted by size so there can only be so many coins.
* The number of cars in a parking lot. A parking lot can only hold a certain number of cars.
* Points on a 10-point rating scale. If you’re graded on a 10-point scale, the only possible values are 1,2,3,4,5,6,7,8,9, and 10.
* Ages on birthday cards. Birthday cards only come in years…they don’t come in fractions. So there are a finite amount of possibilities (presumably, about one hundred).