

## Discrete Variables

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A discrete variable is a kind of statistics variable that can only take on discrete specific values. The variable is not continuous, which means there are infinitely many values between the maximum and minimum that just cannot be attained, no matter what.

For example, the test scores on a standardized test are discrete because there are only so many values that can be obtained on a test. It would be impossible, for example, to obtain a 342.34 score on SAT.



The banner features the Explorable logo at the top center, with the text "EXPLORABLE" in a large, bold, white font and "Quiz Time!" in a smaller, white, cursive font below it. Below the logo are three square images, each with a white border and a white caption below it. The first image shows a pair of red roller skates on a wooden deck, with the caption "Quiz: Psychology 101 Part 2". The second image shows a fan of colorful pens, with the caption "Quiz: Psychology 101 Part 2". The third image shows a Ferris wheel at sunset, with the caption "Quiz: Flags in Europe". To the right of these images is a white button with the text "See all quizzes =>" in a white font.

## Practical Cases

A lot of studies involve the use of a discrete variable [1]. A lot of studies involving human subjects [2] where qualitative experience is converted to quantitative data involves the use of a discrete variable.

For example, suppose a company is launching a new line of potato chips. To get a sense of how these new chips rate as compared to the ones already present in the market, the company needs to perform tests involving human tasters. These people will rate this new product and an old product in the same category and rate the products on a scale, typically on a scale of 1-10. In this case, the score given by each taster for each of the products is a discrete variable.

There are also simpler cases of statistics that involve discrete variables for study. For example, a coin toss can either be a heads or tails. If you want to quantify this data, you can assign 1 for heads and 0 for tails and compute the total score of a random coin tossing experiment. In this case, the variable that keeps track of the outcome is a discrete variable.

Discrete variables are frequently encountered in probability calculations. The above example of a coin tossing experiment is just one simple case. Suppose you go to a casino and want to play the roulette. There are generally two different types of roulettes in most casinos - the American and European. If you want to calculate which one gives you a higher probability of a win, you will need to consider all possible outcomes. This is clearly a discrete variable since on each play, there is a slot in which the ball lands. (As it turns out, the European roulette offers better odds than the American roulette).

## Discrete vs. Continuous Variables

The opposite of a discrete variable is a continuous variable, which can take on all possible values between the extremes. Thus this variable can vary in a continuous manner.

For example, consider the length of a stretched rubber band. Its length can be any value from its initial size to the maximum possible stretched size before it breaks. The length variable can be 10.0 cm or 15.435 cm. The variation is continuous in nature.

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### Links

[1] <http://stattrek.com/probability-distributions/discrete-continuous.aspx>

[2] <https://explorable.com/social-science-subjects>