



M5-01: Random Variables

Part of the "Polling, Confidence Intervals, and the Normal Distribution" Learning Badge

Video Walkthrough: <https://discovery.cs.illinois.edu/m5-01/>

Random Variables

Statisticians use the term random variable for variables whose numeric values are based on the outcome of a random process. The domain of a random variable is the set of possible outcomes. Each outcome has a probability associated with it.

What is the random variable?

Puzzle #1: Create a simulation for counting the number of heads in 10 tosses of a fair coin.

Puzzle #2: Create a simulation for counting the number of 2's that appear in 20 rolls of a fair, six-sided die.

Puzzle #3: A multiple-choice test has 25 questions. Each question has 5 answers. Suppose you simulate guessing at random on each question and your number of correct answers is counted.

Puzzle #4: A roulette table has 38 slots—18 red, 18 black and 2 green. If you bet \$1 on red and it comes up red, then you win \$1; otherwise, you lose \$1. Suppose you simulate playing roulette 50 times, betting \$1 each time.

Discrete vs. Continuous Random Variables

Random variables can be **discrete** or **continuous**. Discrete random variables have a countable number of possible values. Continuous random variables are random variables where the data can take infinitely many values.

Examples:

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