⬙ Distribution Expectation

1 Why

Suppose we are going to make a bunch of measurements. We associate to each element of a finite set a number. If the measurements we make are divided into proportions according to a distribution, if we make all the measurements and then average the results what do we expect to get.

2 Definition

Consider a distribution p and a real-valued function f. The *distribution expectation*f f *under p* is the sum of the product of the results of p and f on the elements of the set.

2.1 Notation

Let A a finite set. Let R denote the set of real numbers. Let $p : A \to R$. Let $f : A \to R$. The expectation of f under p is

$$\sum_{a \in A} p(a) f(a).$$

Probability Outcomes

Probability   Cardinality

Common Sense

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