

## DISTRIBUTION EXPECTATION

## Why

Suppose we are going to make a several 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.<sup>1</sup>

## Definition

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

## Notation

Let A a finite set. Let  $p:A\to [0,1]$  a distribution on a finite set A and let  $f:A\to \mathbb{R}$  a function on A. The expectation of f under p is

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

<sup>&</sup>lt;sup>1</sup>Future editions will modify.

