Why

We have a dataset in some infinite set and want to summarize it by a probability density.

Overview

We have an set uncountable set of outcomes A. We have a dataset $(a^1, \ldots, a^n)$. We want to define a correspondence between the dataset and probability densities over the set of outcomes A.

A *density selector* for a dataset of size n is a function which maps datasets of size n in A to densities on A. We do not want a density on the record sequences A^n, but rather a density on A.

Density Selectors

Probability Densities

Real Integrals

Nonnegative Integrals

Simple Integrals

Measurable Functions

Measure

Sigma Algebras   Extended Real Numbers

Real Limits

Absolute Value

Simple Functions   Real Functions   Interval Length

Intervals   Probability Distributions

Real Line

Real Order   Real Sequences   Real Summation

Real Numbers

Integral Line   Rational Numbers   Sequences

Integer Arithmetic   Set Numbers   Direct Products   Natural Summation

Natural Multiplicative Identity   Natural Additive Identity   Finite Sets   Family Operations

Subset Algebra   Integer Products   Arithmetic   Identity Elements   Equivalent Sets

Integer Sums   Set Operations   Natural Powers   Natural Products   Algebras   Comparisons   Family Unions and Intersections   Function Inverses

Integer Numbers   Natural Sums   Operations   Orders   Function Images   Function Composites   Families

Recursion Theorem   Converse Relations   Natural Order   Equivalence Relations   Functions

Cardinality   Peano Axioms   Relations

Natural Induction   Characteristic Functions   Uncertain Outcomes   Subset Systems   Set Products

Natural Numbers   Set Powers   Ordered Pairs   Generalized Set Dualities

Set Symmetric Differences   Successor Sets   Unordered Triples   Set Dualities   Intersection of Empty Set   Partitions   Set Unions and Intersections

Set Complements   Pair Unions   Set Intersections

Set Differences   Set Unions   Pair Intersections

Empty Set   Unordered Pairs

Geometry   Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets   Identities

Names

Letters   Objects