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

Measures

Sigma Algebras

Extended Real Numbers

Real Series

Real Limits

Absolute Value

Simple Functions

Interval Length

Real Functions

Probability Distributions

Intervals

Real Line

Real Sequences

Real Order

Real Summation

Rational Order

Real Numbers

Integral Line

Rational Numbers

Sequences

Subset Algebras

Integer Arithmetic

Cardinality

Set Numbers

Natural Multiplicative Identity

Natural Additive Identity

Integer Products

Lists

Finite Sets

Identity Elements

Arithmetic

Natural Summation

Equivalent Sets

Direct Products

Family Operations

Natural Power

Function Inverses

Family Unions and Intersections

Algebras

Comparisons

Integer Order

Integer Sums

Natural Products

Function Composites

Function Images

Families

Operations

Order

Integer Numbers

Natural Sum

Equivalence Relations

Functions

Converse Relations

Natural Order

Recursion Theorem

Relations

Peano Axioms

Subset Systems

Set Products

Uncertain Outcomes

Characteristic Functions

Natural Induction

Ordered Pairs

Generalized Set Dualities

Set Powers

Natural Numbers

Set Unions and Intersections

Partitions

Set Symmetric Differences

Intersection of Empty Set

Set Dualities

Unordered Triples

Successor Sets

Pair Intersections

Set Intersections

Set Complements

Pair Unions

Set Unions

Set Differences

Unordered Pairs

Empty Set

Set Specification

Geometry

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects