Why

We want to summarize a dataset in $\mathbf{R}$ with a density.

Definition

The *likelihood* (or *density likelihood*) of a density $f : \mathbf{R} \to \mathbf{R}$ on a datset $x^1, \ldots, x^n \in \mathbf{R}$ is $\prod_{k=1}^n f(x^k)$. A *maximum likelihood density* is a density which maximizes the likelihood among all densities.

As with probability distributions, we say that we are selecting the distribution according to the *maximum likelihood principle*. In general, we call any function from datasets to densities a *density selector*.

Maximum Likelihood Densities

Probability Densities

Real Integrals

Nonnegative Integrals

Simple Integrals

Measurable Functions

Measures

Sigma Algebras

Real Series

Extended Real Numbers

Real Limits

Simple Functions

Absolute Value

Maximum Likelihood Distributions

Real Functions

Interval Length

Probability Distributions

Optimizers

Intervals

Real Line

Real Order

Real Summation

Real Sequences

Real Numbers

Rational Order

Sequences

Integral Line

Rational Numbers

Subset Algebras

Lists

Integer Arithmetic

Cardinality

Set Numbers

Direct Products

Integer Products

Natural Additive Identity

Natural Multiplicative Identity

Finite Sets

Natural Power

Arithmetic

Identity Elements

Natural Summation

Equivalent Sets

Integer Sums

Integer Order

Comparisons

Family Operations

Function Inverses

Family Unions and Intersections

Natural Products

Integer Numbers

Orders

Operations

Function Images

Function Composites

Families

Natural Sums

Natural Order

Equivalence Relations

Converse Relations

Functions

Recursion Theorem

Relations

Characteristic Functions

Peano Axioms

Set Products

Subset Systems

Natural Induction

Uncertain Outcomes

Set Power

Ordered Pairs

Natural Numbers

Unordered Triples

Generalized Set Dualities

Set Symmetric Differences

Successor Sets

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