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

Maximum Likelihood Distribution

Real Series

Extended Real Numbers

Probability Distributions

Real Limits

Absolute Value

Outcome Probabilities

Simple Functions

Interval Length

Real Functions

Intervals

Optimizers

Real Line

Real Order

Real Summation

Real Sequences

Rational Order

Real Numbers

Natural Summation

Sequences

Subset Algebras

Integral Line

Rational Numbers

Limits

Cardinality

Integer Arithmetic

Direct Products

Integer Products

Natural Fractions

Natural Multiplication Identity

Natural Additive Identity

Set Numbers

Finite Sets

Natural Arithmetic

Identity Elements

Equivalent Sets

Family Operations

Integer Order

Integer Sums

Natural Powers

Comparisons

Operations

Function Inverses

Family Unions and Intersections

Integer Numbers

Natural Products

Orders

Families

Function Composites

Function Images

Natural Sums

Equivalence Relations

Natural Order

Converse Relations

Functions

Recursion Theorem

Relations

Peano Axioms

Ordered Pair Projections

Uncertain Outcomes

Natural Induction

Characteristic Functions

Set Products

Subset Systems

Natural Numbers

Generalized Set Dualities

Set Powers

Ordered Pairs

Set Symmetric Differences

Partitions

Set Dualities

Successor Sets

Intersection of Empty Set

Unordered Triples

Set Unions and Intersections

Set Complements

Set Intersections

Pair Unions

Set Differences

Set Unions

Empty Set

Unordered Pairs

Pair Intersections

Geometry

Set Specification

Set Equality

Set Inclusion

Deduction

Quantified Statements

Logical Statements

Statements

Sets

Identities

Names

Letters

Objects