Why

We have studied guessing random variables (see Estimates). What if we can use another random variable in making our estimate?

Definition

Let $(\Omega, \mathcal{A}, \mathbf{P})$ be a probability space. Let U, V be sets. Let $x : \Omega \to V$ and let $y : \Omega \to U$. An *estimator* or *predictor* for x given y is a function from U to V. An estimate, then, corresponds to a constant estimator, and vice versa. Some authors call the selection of an estimator *estimation* or an *estimation problem.*

Error function

An error function is a function $e : U \times V \to \mathbf{R}$ which quantifies the cost of an error.

Estimators

Estimates

Random Variables

Probability Measures · Measurable Functions · Topological Sigma Algebra

Event Probabilities · Measures · Topologies

Metrics · Sigma Algebras

Real Series · Extended Real Numbers · Distance

Real Limits · Space Distance

Absolute Value · Plane Distance

Probability Distributions · Interval Length

Intervals · Real Space

Real Line · Real Plane

Real Summation · Real Order · Real Sequences · Integral Line · Geometry · Subset Algebra

Rational Order · Real Numbers · Sequences · Lists · Cardinality

Rational Numbers · Set Numbers

Integer Arithmetic · Direct Products

Integer Products · Natural Multiplicative Identity · Natural Additive Identity · Finite Sets

Natural Summation · Arithmetic · Identity Elements · Equivalent Sets

Natural Power · Integer Order · Integer Sums · Comparisons · Family Operations · Function Inverses · Family Unions and Intersections

Natural Products · Orders · Integer Numbers · Operations · Families · Function Composites · Function Images

Natural Sums · Natural Order · Converse Relations · Functions · Equivalence Relations

Recursion Theorem

Peano Axioms · Ordered Pair Projections · Relations

Uncertain Outcomes · Natural Induction · Set Products · Subset Systems

Natural Numbers · Set Powers · Generalized Set Dualities · Ordered Pairs

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

Set Complements · Pair Union · Set Intersections

Set Differences · Set Unions · Pair Intersections

Empty Set · Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities · Sets

Names

Letters · Objects

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