Why

We want to model several random variables of interest at once.[1]

Definition

Consider a distribution over a product of n sets, where the product is indexed by the first n natural numbers. We call the distribution a *joint distribution* with n components.

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[1]Future editions will modify this, avoiding the use of the term random variable.

Joint Distributions

Probability Distributions

Intervals

Real Line

Real Order

Geometry

Real Summation

Real Numbers

Rational Numbers

Sequences

Natural Summation

Integer Arithmetic

Direct Products

Family Operations

Natural Multiplicative Identity

Natural Additive Identity

Set Numbers

Families

Algebras

Identity Elements

Arithmetic

Finite Sets

Operations

Equivalent Sets

Natural Exponents

Integer Products

Function Inverses

Natural Products

Integer Sums

Function Images

Function Composites

Natural Sums

Integer Numbers

Functions

Equivalence Relations

Natural Order

Recursion Theorem

Relations

Peano Axioms

Cartesian Products

Uncertain Outcomes

Natural Induction

Set Powers

Natural Numbers

Unordered Triples

Partitions

Successor Sets

Intersection of Empty Set

Ordered Pairs

Pair Unions

Set Intersections

Set Unions

Set Differences

Unordered Pairs

Empty Set

Pair Intersections

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects