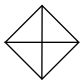


Why

[1]

Definition

Let Z and X be sets, either of which may or may not be finite.

A *latent generation pair* from *latents* Z to *observations* X is an ordered pair $(p_z, p_{x|z})$ whose first coordinate is a distribution (density) on Z and whose second coordinate is a conditional distribution (density) on X from Z.

The *joint function* $p_{zx} : Z \times X \to \mathsf{R}$ of the pair is defined by $p_{zx}(\zeta, \xi) = p_z(\zeta)p_{x|z}(\xi, \zeta)$ for all $\xi \in X$ and $\zeta \in Z$. It is a distribution (density) if (not only if) both p_z and $p_{x|z}$ are distributions (densities). Regardless, we define the *marginal function* $p_x : X \to \mathsf{R}$ by $p_x(\xi) = \int_Z p_{zx}(\xi, \cdot)$. It too may be a distribution, density, or neither. In cases we construct, it is often one a distribution or a density, but it need not be either.

Interpretation as distribution graph

The latent generation pairs from Z to X are isomorphic to the graph distributions whose typed graph $(\{1, 2\}, \{(1, 2)\}), (Z, x)$.[2]

[1]Future editions will include.

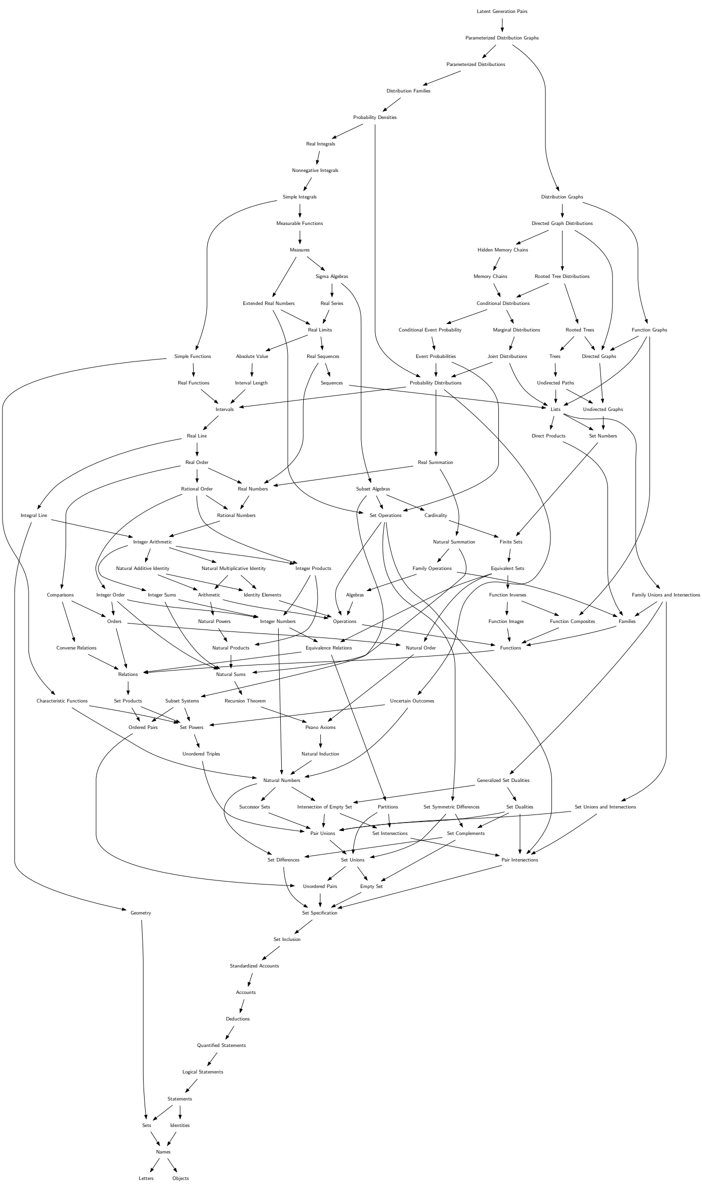
[2]Future editions will include a visualization.

Parametrizations

By parameterizing either or both of the coordinates of the pair, we have *latent generation family*.

Other terminology

Other terminology for latent generation pair includes *latent variable model*. Some authorities refer to the marginal function as the *generative model*, still others use this term to refer to the pair.


Latent Generation Pairs
Parameterized Distribution Graphs
Parameterized Distributions
Distribution Families
Probability Densities
Real Integrals
Nonnegative Integrals
Simple Integrals
Distribution Graphs
Measurable Functions
Directed Graph Distributions
Measures
Hidden Memory Chains
Sigma Algebras
Memory Chains
Rooted Tree Distributions
Extended Real Numbers
Real Series
Conditional Distributions
Real Limits
Conditional Event Probability
Marginal Distributions
Rooted Trees
Function Graphs
Simple Functions
Absolute Value
Real Sequences
Event Probabilities
Joint Distributions
Trees
Directed Graphs
Real Functions
Interval Length
Sequences
Probability Distributions
Undirected Paths
Intervals
Lists
Undirected Graphs
Real Line
Direct Products
Set Numbers
Real Order
Real Summation
Rational Order
Real Numbers
Subset Algebras
Integral Line
Rational Numbers
Set Operations
Cardinality
Integer Arithmetic
Natural Summation
Finite Sets
Natural Additive Identity
Natural Multiplicative Identity
Integer Products
Family Operations
Equivalent Sets
Comparisons
Integer Order
Integer Sums
Arithmetic
Identity Elements
Algebras
Function Inverses
Family Unions and Intersections
Orders
Natural Powers
Integer Numbers
Operations
Function Images
Function Composites
Families
Converse Relations
Natural Products
Equivalence Relations
Natural Order
Functions
Relations
Natural Sums
Characteristic Functions
Set Products
Subset Systems
Recursion Theorem
Uncertain Outcomes
Ordered Pairs
Set Powers
Peano Axioms
Unordered Triples
Natural Induction
Natural Numbers
Generalized Set Dualities
Successor Sets
Intersection of Empty Set
Partitions
Set Symmetric Differences
Set Dualities
Set Unions and Intersections
Pair Unions
Set Intersections
Set Complements
Set Differences
Set Unions
Pair Intersections
Unordered Pairs
Empty Set
Geometry
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects