Why

We want to speak of the pairwise conditional distributions of a particular joint distribution.[1]

Definition

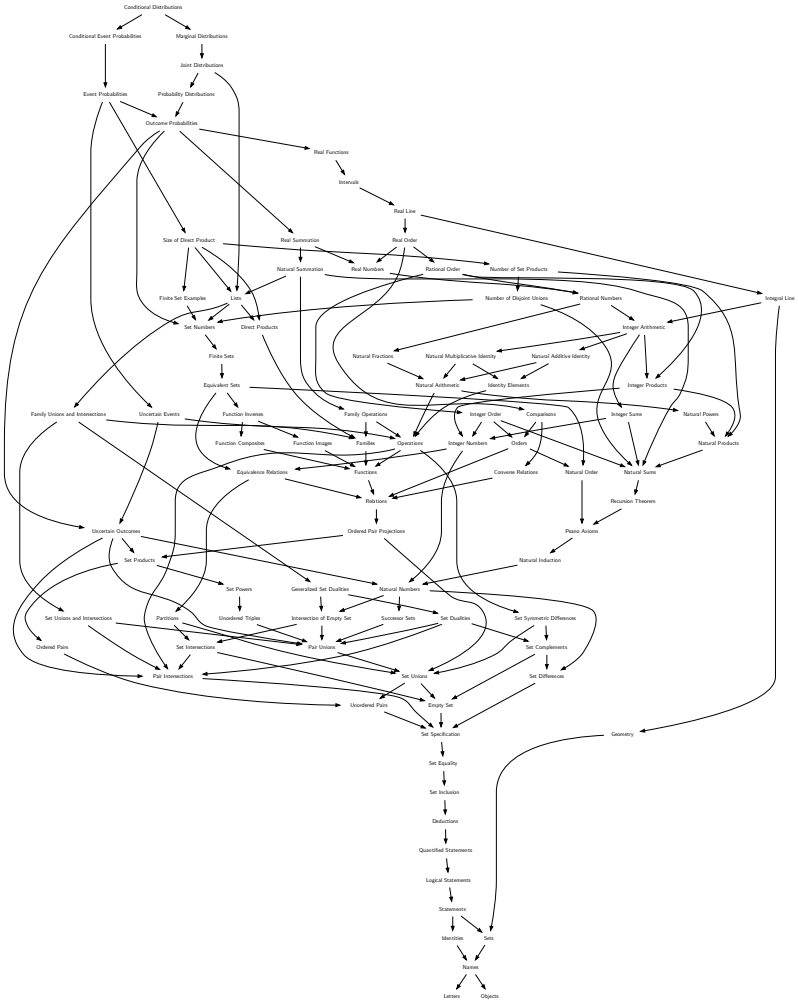
Suppose $A_1, \ldots, A_n$ is a listof finite setsand $p : \prod_{i=1}^n A_i \to [0,1]$ is a distributionon the (finite) product$\prod_{i=1}^n A_i$.

For $i \neq j \in \{1, \ldots, n\}$, the *conditional distribution* of i on j is the function $p_{i|j} : A_i \times A_j \to \mathbf{R}$ defined so that that $p_{i|j}(\cdot, b)$ is the conditional distribution induced by conditioning on $\{a \in \prod_{i=1}^n A_i \mid a_j = b\}$.

For $i, j = 1, \ldots, n$ and $i \neq j$, p_i, p_{ij} and $p_{i|j}$ satisify

$$p_{i|j}(b, c)p_j(c) = p_{ij}(b, c) \quad \text{for all } b \in A_i, c \in A_j$$

[1] Future editions will rework this sheet.


Conditional Distributions
Conditional Event Probabilities
Marginal Distributions
Joint Distributions
Event Probabilities
Probability Distributions
Outcome Probabilities
Real Functions
Intervals
Real Line
Size of Direct Product
Real Summation
Real Order
Natural Summation
Real Numbers
Rational Order
Number of Set Products
Integral Line
Finite Set Examples
Lists
Number of Disjoint Unions
Rational Numbers
Set Numbers
Direct Products
Integer Arithmetic
Finite Sets
Natural Fractions
Natural Multiplicative Identity
Natural Additive Identity
Equivalent Sets
Natural Arithmetic
Identity Elements
Integer Products
Family Unions and Intersections
Uncertain Events
Function Inverse
Family Operations
Integer Order
Comparisons
Integer Sums
Natural Powers
Function Composites
Function Images
Families
Operations
Integer Numbers
Orders
Natural Products
Equivalence Relations
Functions
Converse Relations
Natural Order
Natural Sums
Relations
Recursion Theorem
Uncertain Outcomes
Ordered Pair Projections
Peano Axioms
Set Products
Natural Induction
Set Powers
Generalized Set Dualities
Natural Numbers
Set Unions and Intersections
Partitions
Unordered Triples
Intersection of Empty Set
Successor Sets
Set Dualities
Set Symmetric Differences
Ordered Pairs
Set Intersections
Pair Unions
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Geometry
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
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Objects