Why

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

Definition

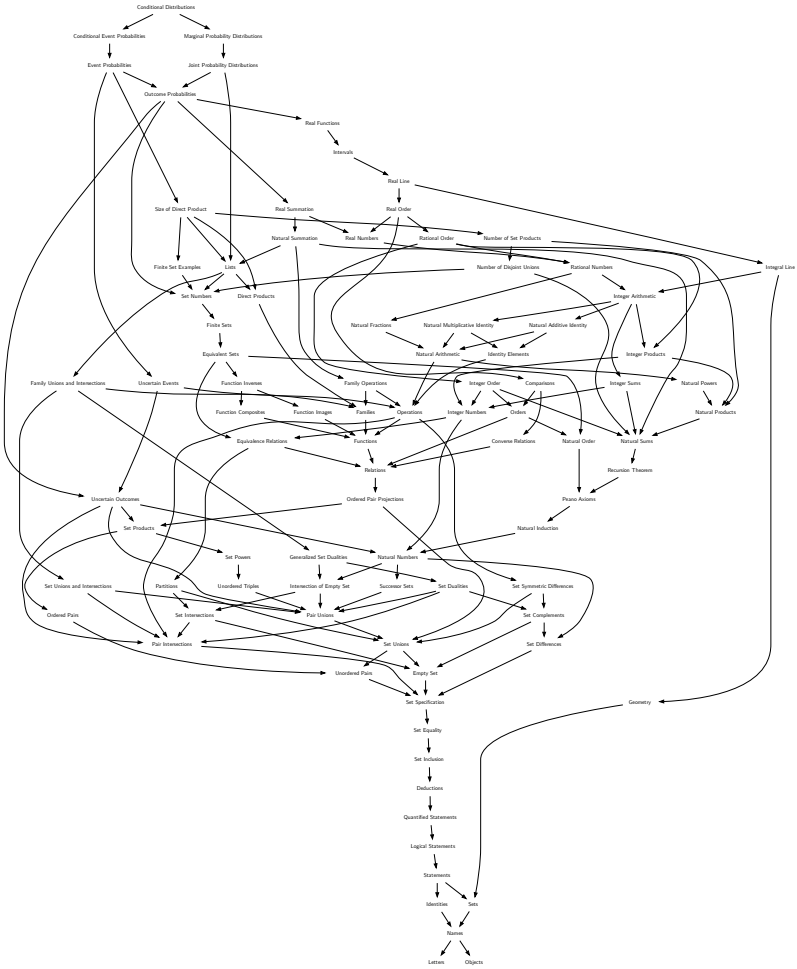
Suppose $A_1, \ldots, A_n$ is a listof finite setsand $p : \prod_{i=1}^n A_i \to [0,1]$ is a distributionon the (finite) product$\prod_{i=1}^n A_i$.

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 Probability Distributions
Event Probabilities
Joint 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
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Number of Disjoint Unions
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Direct Products
Integer Arithmetic
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Natural Fractions
Natural Multiplicative Identity
Natural Additive Identity
Equivalent Sets
Natural Arithmetic
Identity Elements
Integer Products
Family Unions and Intersections
Uncertain Events
Function Inverses
Family Operations
Integer Order
Comparisons
Integer Sums
Natural Powers
Function Composites
Function Images
Families
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Orders
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Equivalence Relations
Functions
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Natural Order
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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
Pair Unions
Set Intersections
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Geometry
Set Equality
Set Inclusion
Deductions
Quantified Statements
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Statements
Identities
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Names
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