Why

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

Definition

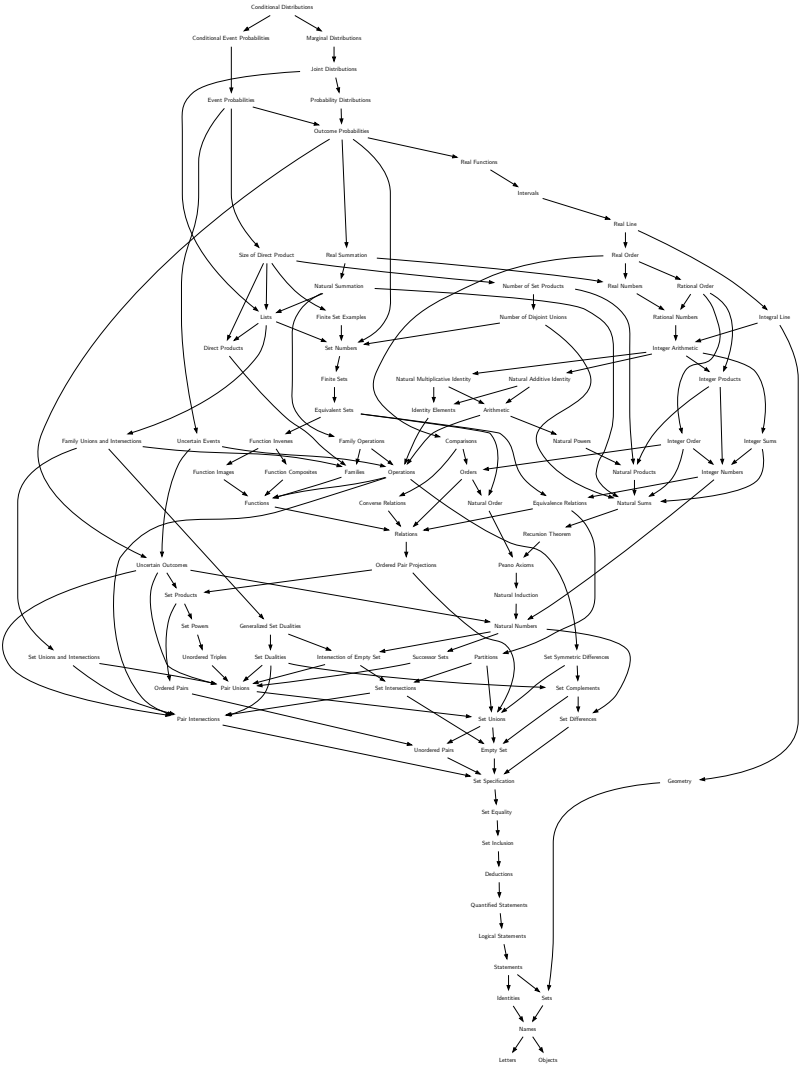
Suppose $A_1, \ldots, A_n$ is a listof finite setsand $p : \prod_{i=1}^n A_i \to [0,1]$ is a distributionon the (finite) product$\prod_{i=1}^n A_i$.

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
Number of Set Products
Real Numbers
Rational Order
Lists
Finite Set Examples
Number of Disjoint Unions
Rational Numbers
Integral Line
Direct Products
Set Numbers
Integer Arithmetic
Finite Sets
Natural Multiplicative Identity
Natural Additive Identity
Integer Products
Equivalent Sets
Identity Elements
Arithmetic
Family Unions and Intersections
Uncertain Events
Function Inverses
Family Operations
Comparisons
Natural Powers
Integer Order
Integer Sums
Function Images
Function Composites
Families
Operations
Orders
Natural Products
Integer Numbers
Functions
Converse Relations
Natural Order
Equivalence Relations
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
Unordered Triples
Set Dualities
Intersection of Empty Set
Successor Sets
Partitions
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
Logical Statements
Statements
Identities
Sets
Names
Lemmas
Objects