Why

I am doing a homework on this.

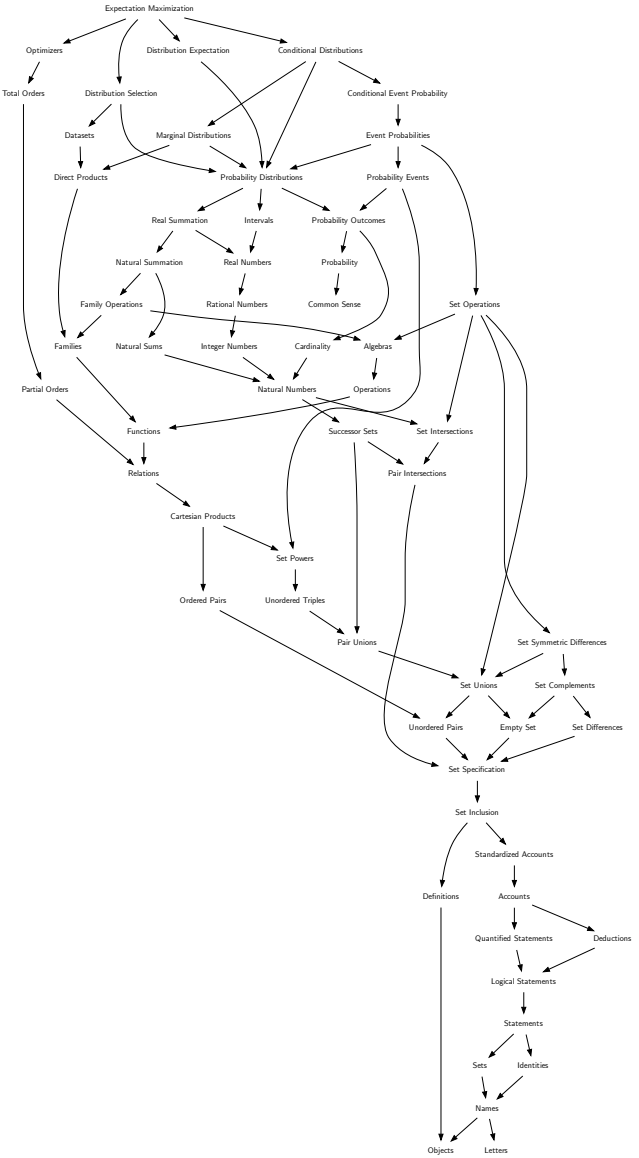
Definition

Let Z and X be non-empty finite sets. We want to model a distribution $p^\theta : Z \times X \to \mathbf{R}$. We parameterize a family of distributions by a parameter θ. We have a dataset $(x^1, \ldots, x^n)$. Given a parameter θ^0, we want to solve

$$\begin{aligned} \textbf{find} \quad & \theta \\ \textbf{to maximize} \quad & \sum_{k=1}^{n} \mathbf{E}_{p^{\theta^0}_{z|x}(z,x^k)} \left[\log p^\theta(z,x)\right] \end{aligned}$$

0.1 Binary Gaussian Mixture Example

The


Expectation Maximization
Optimizers
Distribution Expectation
Conditional Distributions
Total Orders
Distribution Selection
Conditional Event Probability
Datasets
Marginal Distributions
Event Probabilities
Direct Products
Probability Distributions
Probability Events
Real Summation
Intervals
Probability Outcomes
Natural Summation
Real Numbers
Probability
Family Operations
Rational Numbers
Common Sense
Set Operations
Families
Natural Sums
Integer Numbers
Cardinality
Algebras
Partial Orders
Natural Numbers
Operations
Functions
Successor Sets
Set Intersections
Relations
Pair Intersections
Cartesian Products
Set Powers
Ordered Pairs
Unordered Triples
Pair Unions
Set Symmetric Differences
Set Unions
Set Complements
Unordered Pairs
Empty Set
Set Differences
Set Specification
Set Inclusion
Standardized Accounts
Definitions
Accounts
Quantified Statements
Deductions
Logical Statements
Statements
Sets
Identities
Names
Objects
Letters