Why

I am doing a homework on this.

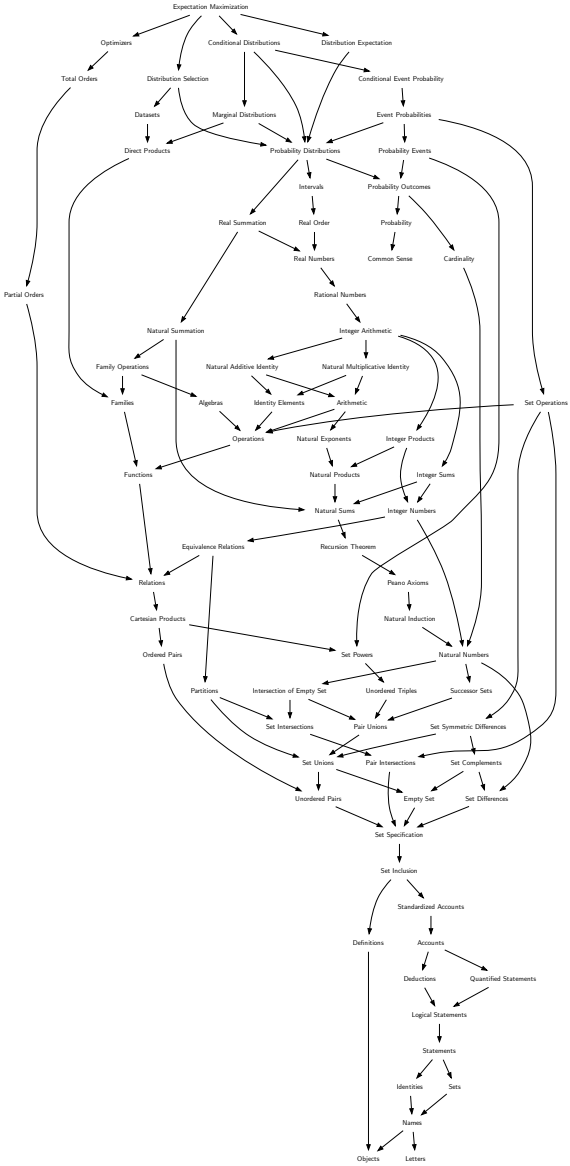
Definition

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
Conditional Distributions
Distribution Expectation
Total Orders
Distribution Selection
Conditional Event Probability
Datasets
Marginal Distributions
Event Probabilities
Direct Products
Probability Distributions
Probability Events
Intervals
Probability Outcomes
Real Summation
Real Order
Probability
Real Numbers
Common Sense
Cardinality
Partial Orders
Rational Numbers
Natural Summation
Integer Arithmetic
Family Operations
Natural Additive Identity
Natural Multiplicative Identity
Families
Algebras
Identity Elements
Arithmetic
Set Operations
Operations
Natural Exponents
Integer Products
Functions
Natural Products
Integer Sums
Natural Sums
Integer Numbers
Equivalence Relations
Recursion Theorem
Relations
Peano Axioms
Cartesian Products
Natural Induction
Ordered Pairs
Set Powers
Natural Numbers
Partitions
Intersection of Empty Set
Unordered Triples
Successor Sets
Set Intersections
Pair Unions
Set Symmetric Differences
Set Unions
Pair Intersections
Set Complements
Unordered Pairs
Empty Set
Set Differences
Set Specification
Set Inclusion
Standardized Accounts
Definitions
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Objects
Letters