Why

[1]

Definition

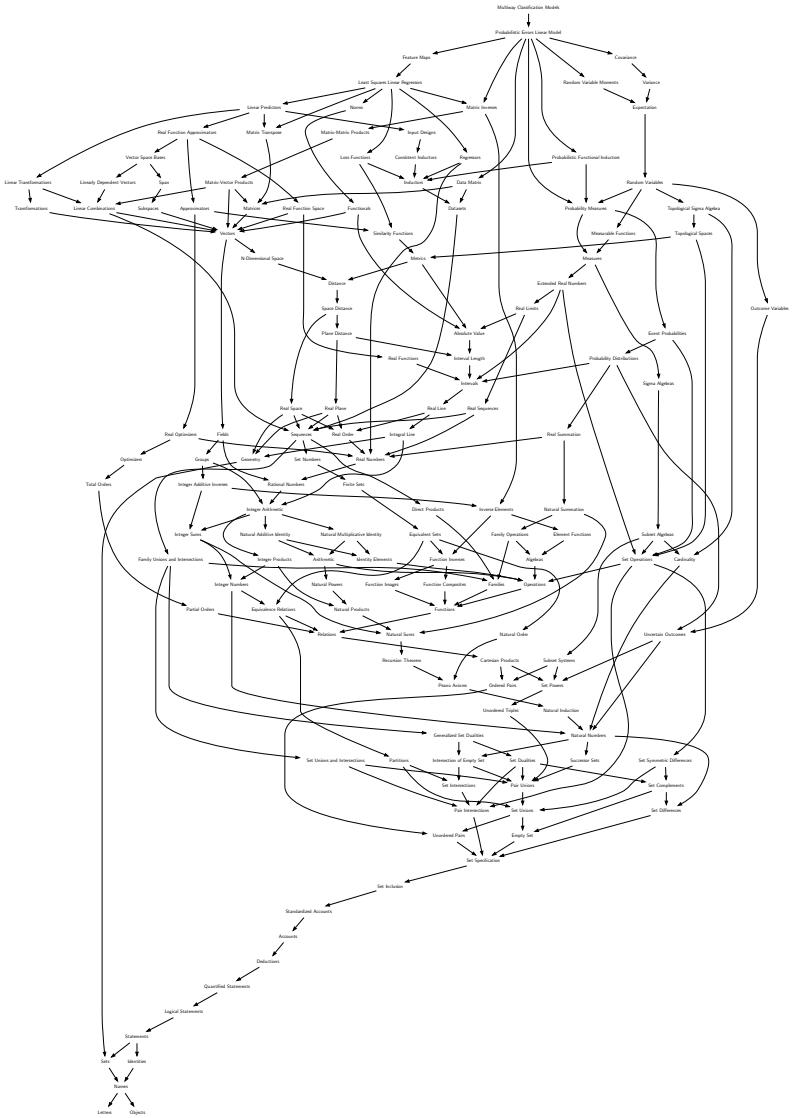
The *two-sample model* (or the *two-sample problem*) has input space $\{1, 2\}$ and regression function $\phi : \{1, 2\} \to \mathbf{R}^2$ where $\phi(1) = (1, 0)^\top$ and $\phi(2) = (0, 1)^\top$. In this case, we model two populations (corresponding to 1 and 2) with different means but a common variance. The regression range is the set $\{(1, 0), (0, 1)\}$.

Generalizing from two to a populations gives the *one-way classification model*. In that case the input space is $\{1, \ldots, a\}$ and the regression function is $\phi : \{1, \ldots, a\} \to \mathbf{R}^a$ defined by $\phi(i) = e_i$ where e_i is the standard unit vector in $\mathbf{R}^a$.[2] The regression range is $\{e_1, \ldots, e_a\}$. In this case we say that the *factor* population takes *levels* $1, \ldots, a$.

If there are more than one factors, then we have a *multiway classification model*. For example, the *two-way classification model with no interaction* has input domain $X = \{1, \ldots, a\} \times \{1, \ldots, b\}$ and the regression function $\phi : X \to \mathbf{R}^{a+b}$ is defined by $\phi(i, j) = (e_i, e_j)^\top$.

[1] Future editions will include.

[2] Future editions will define the standard unit vector.


Multiway Classification Models
Probabilistic Errors Linear Model
Feature Maps
Covariance
Least Squares Linear Regression
Random Variable Moments
Variance
Linear Predictors
Norms
Matrix Inverses
Expectation
Real Function Approximation
Matrix Transpose
Matrix-Matrix Products
Input Designs
Vector Space Axioms
Loss Functions
Consistent Inductors
Regressors
Probabilistic Functional Induction
Linear Transformations
Linearly Dependent Vectors
Span
Matrix-Vector Products
Induction
Data Matrix
Random Variables
Transformations
Linear Combinations
Subspaces
Approximation
Matrices
Real Function Space
Functionals
Datasets
Probability Measures
Topological Sigma Algebras
Vectors
Similarity Functions
Measurable Functions
Topological Spaces
Metrics
Measures
N-Dimensional Space
Distance
Extended Real Numbers
Space Distance
Real Limits
Outcome Variables
Absolute Value
Plane Distance
Event Probabilities
Real Functions
Interval Length
Probability Distributions
Intervals
Sigma Algebras
Real Space
Real Plane
Real Line
Real Sequences
Real Optimizers
Fields
Sequences
Real Order
Integral Line
Real Summation
Optimizers
Groups
Geometry
Set Numbers
Real Numbers
Total Orders
Integer Additive Inverses
Rational Numbers
Finite Sets
Integer Arithmetic
Direct Products
Inverse Elements
Natural Summation
Integer Sums
Natural Additive Identity
Natural Multiplicative Identity
Equivalent Sets
Family Operations
Element Functions
Subset Algebras
Family Unions and Intersections
Integer Products
Arithmetic
Identity Elements
Function Inverses
Algebras
Set Operations
Cardinality
Integer Numbers
Natural Powers
Function Images
Function Composites
Families
Operations
Partial Orders
Equivalence Relations
Natural Products
Functions
Relations
Natural Sums
Natural Order
Uncertain Outcomes
Recursion Theorem
Cartesian Products
Subset Systems
Peano Axioms
Ordered Pairs
Set Powers
Unordered Triples
Natural Induction
Generalized Set Dualities
Natural Numbers
Set Unions and Intersections
Partitions
Intersection of Empty Set
Set Dualities
Successor Sets
Set Symmetric Differences
Set Intersections
Pair Unions
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Set Includes
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Theme
Letters
Objects