Why

We are given an element of some set, and want to find an element (in some subset) which is most similar to it.

Definition

Consider a non-empty set, one of its subsets, and a similarity function on it. An *approximator* of an element of the set is any element of the subset. So we call the subset the set of *approximators*. One approximator may be more similar than another. An *optimal* approximator is a minimizer of the similarity function over the set of approximators.

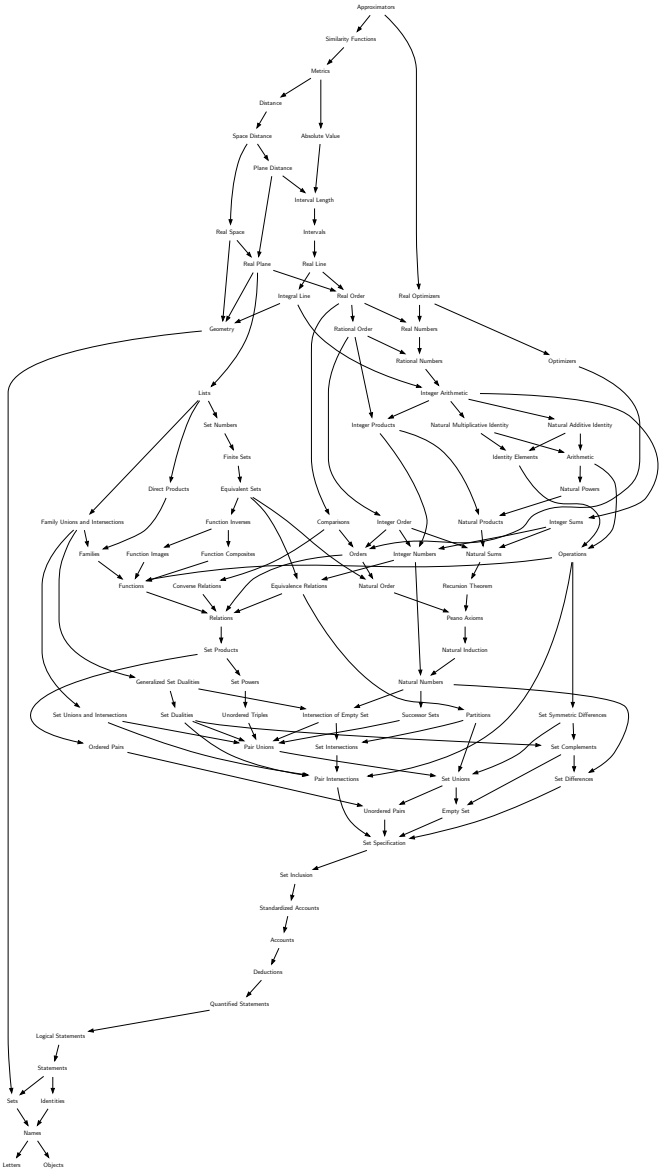
Notation

Let B be a non-empty set. Let $A \subset B$. Let $d : B \times B \to \mathbf{R}$ be a similarity function. For $b \in B$, every $a \in A$ is an approximator of b. An optimal b is a solution of

$$\begin{aligned} \text{minimize} \quad & d(b, a) \\ \text{subject to} \quad & a \in A. \end{aligned}$$

ε approximations

Let $a, b \in B$. For $\varepsilon > 0$, we say that an element b *ε-approximates* $a \in A$ if $d(a, b) \leq \varepsilon$.


Approximators
Similarity Functions
Metrics
Distance
Space Distance
Absolute Value
Plane Distance
Interval Length
Real Space
Intervals
Real Plane
Real Line
Integral Line
Real Order
Real Optimizers
Geometry
Rational Order
Real Numbers
Rational Numbers
Optimizers
Lists
Integer Arithmetic
Set Numbers
Integer Products
Natural Multiplicative Identity
Natural Additive Identity
Finite Sets
Identity Elements
Arithmetic
Direct Products
Equivalent Sets
Natural Powers
Family Unions and Intersections
Function Inverses
Comparisons
Integer Order
Natural Products
Integer Sums
Families
Function Images
Function Composites
Orders
Integer Numbers
Natural Sums
Operations
Functions
Converse Relations
Equivalence Relations
Natural Order
Recursion Theorem
Relations
Peano Axioms
Set Products
Natural Induction
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Set Dualities
Unordered Triples
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
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects