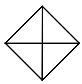


Why

[1]

Definition

Let $\mathcal{P} = ((\mathcal{A}^i)_{i=1}^n, (\mathcal{O}^i)_{i=1}^n, \preceq)$ be an n-stage decision problem with constant actions sets $\mathcal{A}_h^t = U_t$ for each history $h \in H^{t-1}$. In other words, the actions available at stage t do not depend on the history, only on the stage t.

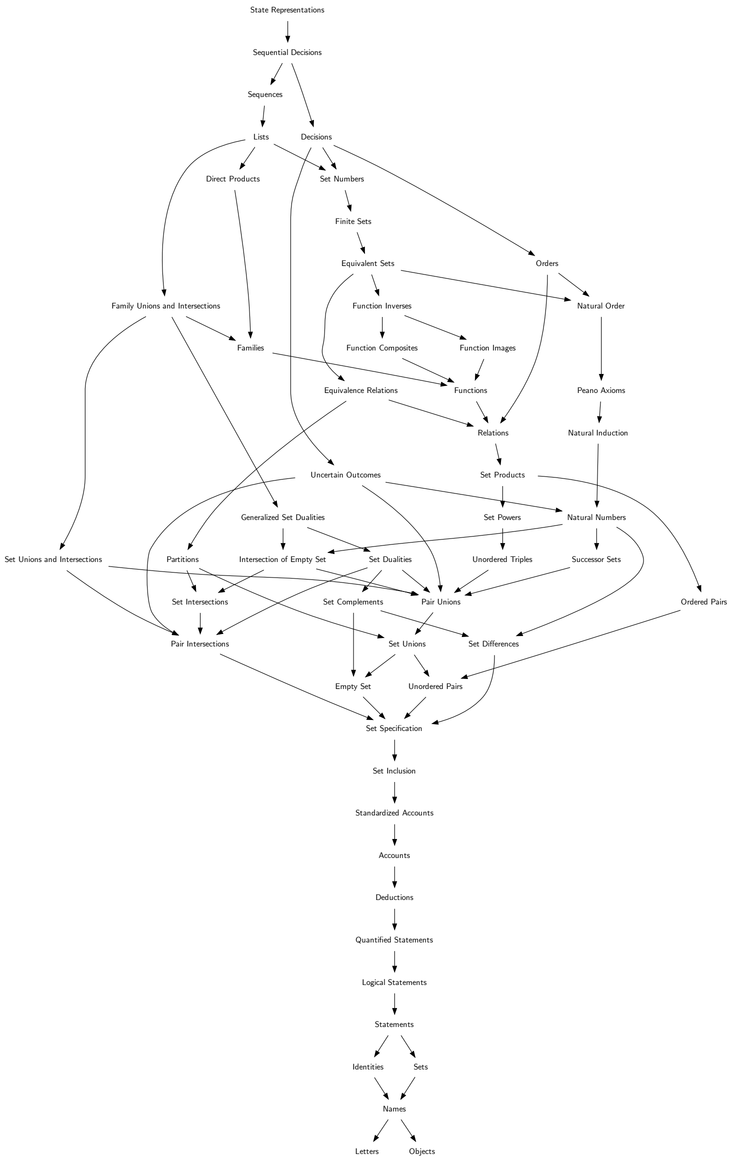
A *state representation* for $\mathcal{P}$ is tuple

$$(\{\mathcal{X}_t\}_{t=1}^{n+1}, \{f_t : \mathcal{X}_t \times \mathcal{U}_t \to \mathcal{X}_{t+1}\}_{t=1}^n)$$

satisfying $x_{t+1} = f_t(u_t, x_t)$ for all $x_t \in \mathcal{X}_t$, $x_{t+1} \in \mathcal{X}_{t+1}$, $u_t \in \mathcal{U}_t$, $t = 1, \dots, n$.[2]

[1] Future editions will include. Those editions may rename this sheet and also provide examples.

[2] Future editions will continue this development, and add the other necessary conditions on state representations. To say more here is involved, and this sheet will likely me reworked to use the genetic method via applications in celestial mechanics.


State Representations
Sequential Decisions
Sequences
Lists
Decisions
Direct Products
Set Numbers
Finite Sets
Equivalent Sets
Orders
Family Unions and Intersections
Function Inverses
Natural Order
Families
Function Composites
Function Images
Equivalence Relations
Functions
Peano Axioms
Relations
Natural Induction
Uncertain Outcomes
Set Products
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Partitions
Intersection of Empty Set
Set Dualities
Unordered Triples
Successor Sets
Set Intersections
Set Complements
Pair Unions
Ordered Pairs
Pair Intersections
Set Unions
Set Differences
Empty Set
Unordered Pairs
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects