Definition

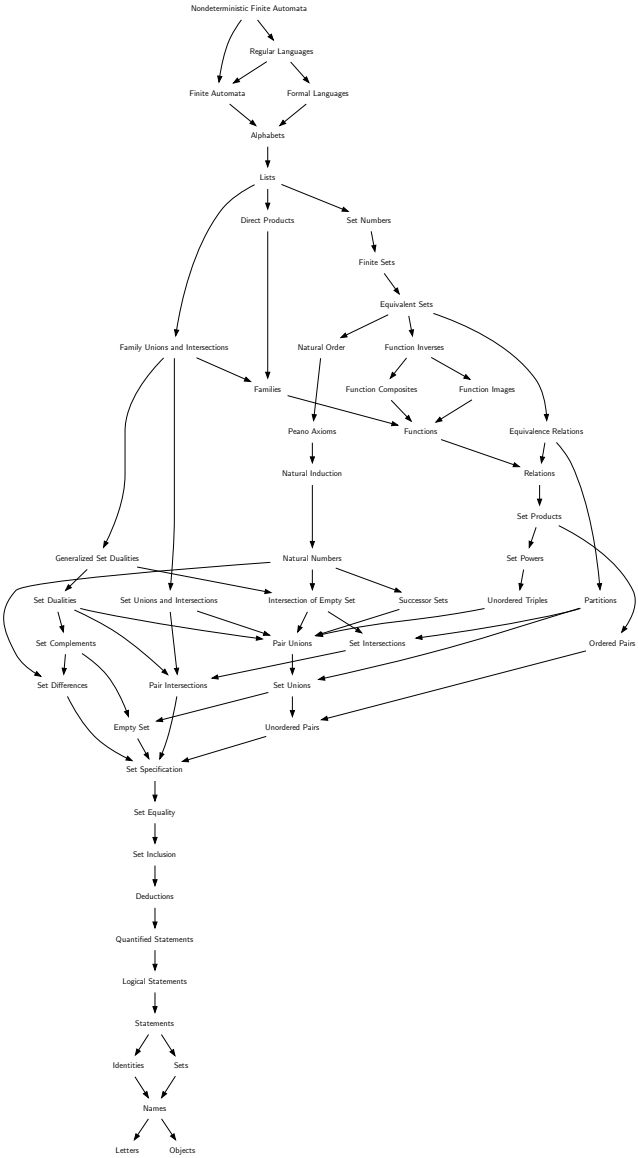
A *nondeterministic finite automata* $N = (Q, \Sigma, \delta, q_0, F)$ is a list where Q and Σ are finite sets, $\delta : Q \times \Sigma \to \mathcal{P}(Q)$, $q_0 \in Q$ and $F \subset Q$. A *nondeterministic finite automata with empty moves* $N = (Q, \Sigma, \delta, q_0, F)$ is a list where Q and Σ are finite sets, $\delta : Q \times (\Sigma \cup \{\varnothing\}) \to \mathcal{P}(Q)$, $q_0 \in Q$ and $F \subset Q$.

As with finite automata, we call Q the *states*, Σ the *alphabet*, δ the *transition function*, q_0 the *start state*, and F the *accept states* (or *final states*). An input $u \in \mathsf{str}(\Sigma)$ results in a state sequence $x \in \mathsf{str}(Q)$ with $x_1 = q_0$ and $x_{i+1} = \delta(x_i, u_i)$ for $i = 1, \ldots, |u|$.

Main result

For any automata M, there exists a nondeterminstic finite automata N such that N accepts the same languages as M.[1] For this reason, a language is regular if and only if some nondeterministic finite automaton accepts it.

[1] Future editions will include an account.


Nondeterministic Finite Automata
Regular Languages
Finite Automata
Formal Languages
Alphabets
Lists
Direct Products
Set Numbers
Finite Sets
Equivalent Sets
Family Unions and Intersections
Natural Order
Function Inverses
Families
Function Composites
Function Images
Peano Axioms
Functions
Equivalence Relations
Natural Induction
Relations
Set Products
Generalized Set Dualities
Natural Numbers
Set Powers
Set Dualities
Set Unions and Intersections
Intersection of Empty Set
Successor Sets
Unordered Triples
Partitions
Set Complements
Pair Unions
Set Intersections
Ordered Pairs
Set Differences
Pair Intersections
Set Unions
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects