



Semantics

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Resolution Strategies

A possible world is:

Propositional: a truth assignment for symbols. Exponential number of worlds based on number of symbols.

First-Order: a set of objects and an interpretation for constants, functions, and predicates. Potentially infinite worlds.

Terminology

Interpretation: a mapping of constant symbols to real-world objects, function symbols to functions on objects, and predicate symbols to relations.

Model of P : an interpretation in which P is true.

Famous(ThomasEdison) is true for the expected interpretation, but not true if *ThomasEdison* maps to my sister's goldfish.

Satisfiable: \exists a model for P .

Entailment: if Q is true in every model of P , then $P \models Q$.

Valid: true in every interpretation.

Another Example

- 1 Anyone whom Davis loves is a researcher.
- 2 Any person who does not experiment does not publish.
- 3 Sandra is a person.
- 4 Anyone who does not hypothesize does not experiment.
- 5 Anyone who does not publish is not a researcher.
- 6 Prove: If Sandra does not hypothesize, then Davis does not love Sandra.

Resolution Strategies

- **Breadth-first:** generate all first-level resolvents from KB, then all second-level resolvents from KB and first, then...
 - Complete, slow to compute
- **Set of Support:** Start with negated query alone in set of clauses, pick at least one clause from set
 - Usually complete, easy to trace back logic
- **Input Resolution:** pick at least one parent from input clauses
 - Complete for Horn form: when each clause has at most one positive literal