Programmatic Semantics

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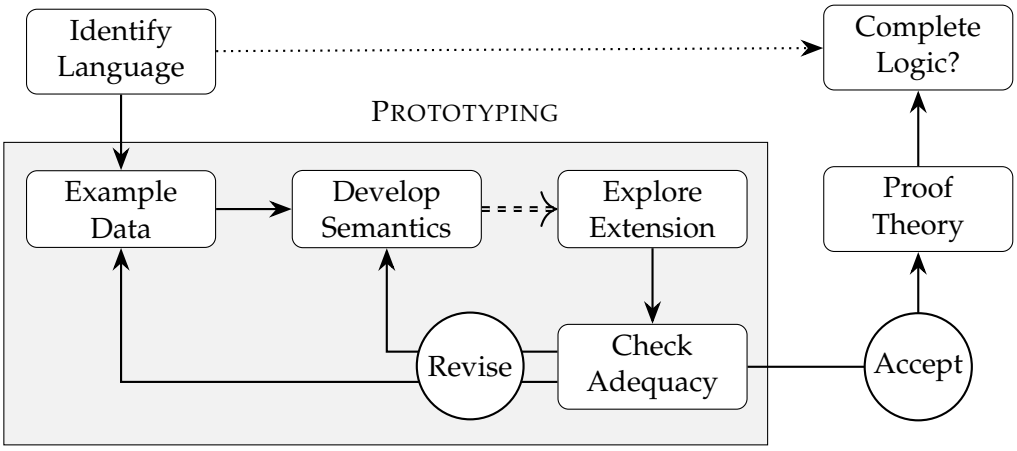
Broad Ambitions

Extend the standard methodology in semantics to:

- Rapidly prototype semantic theories by reducing cognitive load
- Facilitate collaboration and increase accessibility
- Support the maturity of the discipline

Standard Methodology



Difficulties

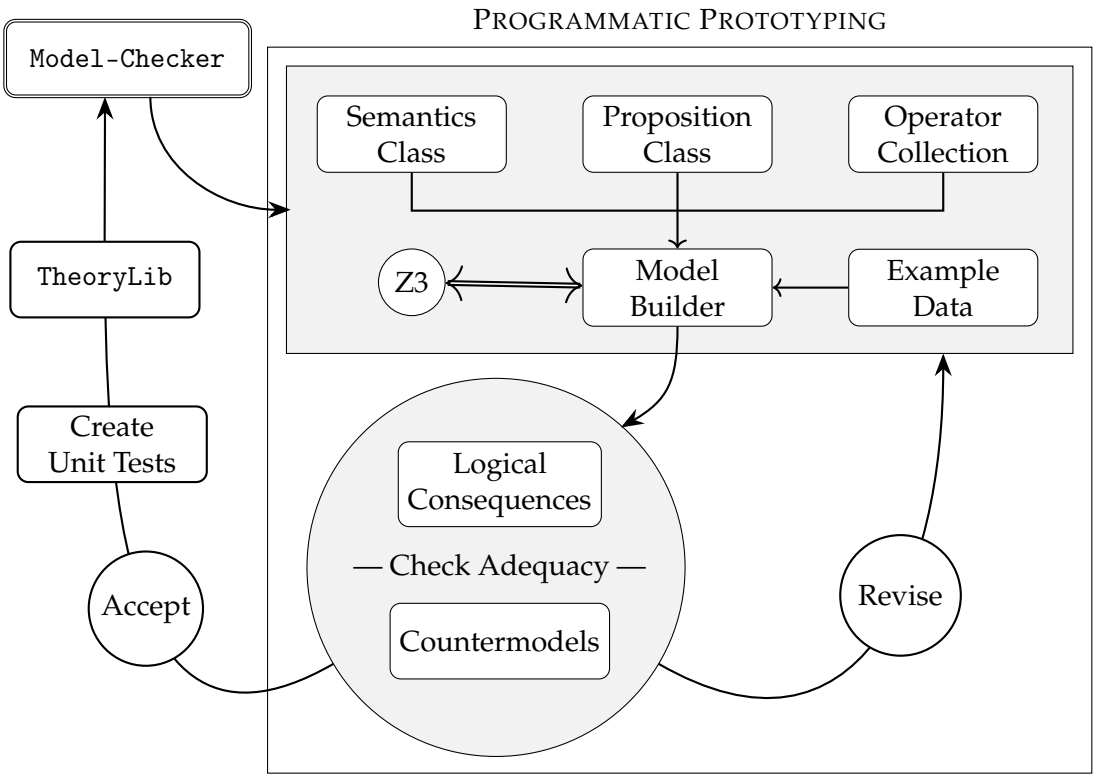
The standard methodology has the following drawbacks:

- Computationally grueling to prototype semantic theories
- Problems of accuracy, redundancy, and memory
- Limits complexity in the development of semantic theories
- Restricts which language fragments can be studied/combined

An Extended Methodology

Humans should not be carrying the computational load.

- SAT solvers, SMT solvers, Z3
- Examples: inequalities, bitvectors as states
- Z3 constraints as truth-conditions



Conceptual Engineering

This methodology has the following advantages:

- Efficiently prototype new semantic theories
- Modular semantics, theory of propositions, operators
- Evaluate unified languages with many operators
- Compare rival theories over large data sets

Give it a try at: `https://pypi.org/project/model-checker/`