

Propositional and First-Order Logic

Chapter 7.4–7.8, 8.1–8.3, 8.5

Logic roadmap overview

- **Propositional logic**

- Problems with propositional logic

- **First-order logic**

- Properties, relations, functions, quantifiers, ...

- Terms, sentences, wffs, axioms, theories, proofs, ...

- Variations and extensions to first-order logic

- **Logical agents**

- Reflex agents

- Representing change: situation calculus, frame problem

- Preferences on actions

- Goal-based agents

Disclaimer



“Logic, like whiskey, loses its beneficial effect when taken in too large quantities.”

- *Lord Dunsany*

Big Ideas

- **Logic**: great knowledge representation (KR) language for many AI problems
- **Propositional logic**: simple foundation and fine for many AI problems
- **First order logic (FOL)**: more expressive as a KR language; needed for many AI problems
- **Variations** on classical FOL are common: horn logic, higher-order logic, modal logic, three-valued logic, probabilistic logic, fuzzy logic, etc.

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