

Dependent Types and Theorem Proving: Proving is programming in disguise

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1 Constructive propositional logic: you already know it

- Propositional logic
- Propositions are types, proofs are programs
 - Function types are implications
 - Sum is disjunction
 - Product is conjunction
 - Unit is True
 - Falsity and negation

2 First-order logic: you already know it

- Predicates and relations
- Universal quantifier is the dependent function type
- Existential quantifier is the dependent pair type

3 Inductive predicates and relations

- Undecidability and generative thinking
- Proof relevance
- Equality

4 Axioms and classical logic

5 How to find proofs

6 Exercises

