Project Description

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1 Formalization of mathematical problems

When solving mathematical problems, one often uses proofs to assert some claim. Proofs can be written either *informally* or *formally*.

An informal proof is often written in a natural language, where the truth of the proof is determined by if the reader is convinced by the proof or not. ref (https://softwarefoundations.cis.upenn.edu/lf-current/Induction.htmllab58)
This can lead to mistakes in the proofs reasoning, as it is hard to be 100% certain that every step in the proof is solid (especially with larger ones). ref (marc slides)

2 Proof assistants

A formal proof can be written like a computer program, where all the arguments can be checked mechanically; often done using a proof assistant.
Coq is a proof assistant that enables us to write fomal proofs and verify them. Coq uses type theory to verify proofs, but can also be used as a functional programming language. ref (https://en.wikipedia.org/wiki/Coq)
Other examples of proof assistants include Agda, Isabelle, Lean and HOH.