The B-Method

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History

- Developed by Jean-Raymond Abrial, in 1991.
- Based on the Z-notation (also by Abrial).
  - But enhanced with *refinement* and *proof*.
- Extended with events (Event-B) in 2005 (?).

What is it?

- A formal method (not just a PA)
- *Models* of machines (programs, systems)
- Models see *contexts*, which contain sets, constants, axioms.
- Basically, Hoare-style reasoning (pre-, and postconditions, invariants).

Proving and modelling

- Start with a general model of a system.
- Prove that a model satisfies invariants.
- *Refine* a model, adding more invariants/methods, iterate.
- Final refinement: code.
- Proofs are supported by a combination of ATP and ITP (tools based on set theory).
- To do mathematics: only the contexts are needed.

Who uses it?

- Both open source (Rodin) and commercial (AtelierB) tools.
- Taught in French universities.
- In industry: system safety (Metro 14, Paris).
- Not really used for mathematics.