

Modelling in B

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***Abstract.** B is a language that was designed and used before Event B, for the design and development of safety critical software.*

The B language is introduced and demonstrated on several case-studies (traffic light control system, railway automatic pilot, etc.). All the steps leading from formal specification to final source code are exposed and detailed, within the modelling environment.

Proof environment is presented and differences with Event B proof are exposed, in particular the mathematical language used to define additional rules that could be used to dramatically shorten an interactive demonstration as well as the capability to define and apply generic demonstrations over proof obligation categories (pattern matching).

Automated refinement capability is introduced through the use of a dedicated refinement engine and a set of refinement rules, able to automatically transform an abstract model or a refinement into an implementation. The principles of the engine are exposed and some rules are analysed and applied on a case-study.