Towards B as a
High-Level Constraint Modelling Language
Solving The Jobs Puzzle Challenge[*]

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Abstract. The B-method is a formal method for specifying safety critical systems, reasoning about those systems and generating code that is correct by construction. The B-Language, part of this method, is a rich, mathematical language based on abstract machines and built around the concepts of first order logic, higher-order relations and set theory. Due to its expressiveness the B-Language allows its users to formalize and express complex problems in a succinct and elegant way on a high level of abstraction.

We argue that B is a good language to conveniently express a wide range of constraint satisfaction problems. We also show that some problems can be solved quite effectively by the ProB tool. We illustrate our claim on several examples, such as the *jobs puzzle* - for which we solve the challenge set out by Shapiro. Here we show that the B formalization is both very close to the natural language specification and can still be solved efficiently by ProB. Our approach is particularly interesting when a high assurance of correctness is required. Indeed, compared to other existing approaches and tools, validation and double checking of solutions is available for ProB and formal proof can be applied to establish important properties or provide an unambiguous semantics to the problem specification.

Keywords: B-method, constraint programming, logic programming

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