On logically characterizing automata

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Abstract

Büchi-Elgot-Trakhtenbrot theorem reads that monadic second order logic over words characterizes the recognizable languages. The proof is a simple induction on the structure of the formulas, which is facilitated by the fact that the automata are closed under complementation. When the automata are not closed under complementation, the straightforward approach does not work. We exemplify a commonly used method in the literature in the context of automata over words over an infinite alphabet.