Thierrin, G.
Permutation automata. (English) Zbl 0157.33702

A permutation (p-)automaton is a Rabin-Scott one-way, one-tape automaton in which the mapping of the state set into itself induced by each input is a permutation. In Section 2 the author obtains several theorems giving various conditions on the congruence relation induced on the set of input strings which are necessary and sufficient for an automaton to be a p-automaton; typical conditions are that the relation be a right-cancellative right congruence, and that the semigroup of the machine be a group. These theorems are then applied in Section 3 to show that p-automata are strongly connected (in minimal form), and in Section 4 to show that the family of sets of strings accepted by p-automata is closed under Boolean operations, transposition, and pre- and post-fix deletion (quotient) by an arbitrary set. It would seem that the usual arguments, either in terms of the accepting machines or of their associated groups, give these results in a simpler and more perspicuous manner. The present treatment seems rather awkward, falling between a fully algebraic treatment and a direct intuitive treatment in terms of state diagrams. However, it may be that the detailed theorems of Section 2 have an independent interest.

Reviewer: J. D. Rutledge

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MSC:
68Q45  Formal languages and automata

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References:

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