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On the Study of All Waterloo Automaton Semilattices

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Abstract : The aim is to study the set of subsets of grids of the Waterloo automaton and the set of covering automata defined by the grid subsets. The study was carried out using the library for working with nondeterministic finite automata NFALib implemented by one of the authors (M. Abramyan) in C#. The results are regularities obtained when considering semilattices of covering automata for the Waterloo automaton. A complete description of the obtained semilattices from the point of view of equivalence of the covering automata to the original Waterloo automaton is given, the criterion of equivalence of the covering automaton to the Waterloo automaton in terms of properties of the subset of grids defining the covering automaton is formulated. The relevance of the subject area under consideration is due to the need to research a set of regular languages and, in particular, a description of their various subclasses. Also relevant are the problems that may arise in some subclasses. This will give, among other things, the possibility of describing new algorithms for the equivalent transformation of nondeterministic finite automata.

Keywords : nondeterministic finite automata, universal automaton, grid, covering automaton, equivalent transformation algorithms, the Waterloo automaton
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