ON MONOTONIC DIRECTABLE NONDETERMINISTIC AUTOMATA [1]

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ABSTRACT

A finite automaton is called directable if it has an input word which takes it from every state into the same state. Directability of nondeterministic (n.d.) automata can be defined in different ways. In [7], three notions of directability, D1-, D2-, and D3-directability, are introduced. Here, for each $i = 1, 2, 3$, we present sharp bounds for the maximal lengths of the shortest Di-directing words of n-state monotonic Di-directable n.d. automata.

Keywords: Algebraic theory of automata, nondeterministic automata, directability, synchronizing

1. Introduction

An input word w is called a *directing* (or *synchronizing*) *word* of an automaton $\mathcal{A}$ if it takes $\mathcal{A}$ from every state to the same state. Directable automata have been studied extensively, while directable nondeterministic (n.d.) automata have obtained fewer interest. For n.d. automata three nonequivalent definitions of directability are introduced and studied in [7]. In accordance with [7], an input word w of an n.d. automaton $\mathcal{A}$ is called

(1) D1-*directing* if it takes $\mathcal{A}$ from every state to the same singleton set,

(2) D2-*directing* if it takes $\mathcal{A}$ from every state to the same fixed set A' with $\emptyset \subseteq A' \subseteq A$,

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