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WEIGHTED GRAMMARS AND AUTOMATA WITH THRESHOLD INTERPRETATION[1]

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ABSTRACT

We discuss a particular type of weighted grammars and automata over the partially ordered group of additive real vectors $\mathbb{R}^k$, and its subgroups $\mathbb{Z}^k$ and $\mathbb{Q}^k$, as well as over the partially ordered group of component-wise multiplicative vectors with positive rational components. Computational power of these devices is investigated in comparison with the computational power of valence grammars and blind multicounter automata. We show that all these families are either full principal semi-AFL or full semi-AFL. Finally, some decidability matters are discussed.

Keywords: Weighted automata, valence grammars

1. Introduction

Weighted grammars and automata are important generalizations of context-free grammars and finite automata widely and successfully used in many applications like text and speech processing [2, 14, 15].

Chomsky considered in [1] that no theory for the linguistic structure based exclusively on finite state grammars would be able of explaining or giving information

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