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INCLUSION OF REGULAR AND LINEAR LANGUAGES IN GROUP LANGUAGES

KRASIMIR YORDZHEV

Faculty of Mathematics and Natural Sciences
South-West University, Blagoevgrad, Bulgaria

Abstract

Let $\Sigma = X \cup X^{-1} = \{x_1, x_2, ..., x_m, x_1^{-1}, x_2^{-1}, ..., x_m^{-1}\}$ and let G be a group with the set of generators Σ. Let $\mathfrak{L}(G) = \{\omega \in \Sigma^* \mid \omega \equiv e \pmod{G}\} \subseteq \Sigma^*$ be the group language representing G, where Σ^* is the free monoid over Σ and e is the identity in G. The problem of determining whether a context-free language is subset of a group language is discussed. Polynomial algorithms are presented for testing whether a regular language, or a linear language is included in a group language. A few finite sets are built, such that each of them is included in the group language $\mathfrak{L}(G)$ if and only if the respective context-free language is included in $\mathfrak{L}(G)$.

Key Words : *Group language, Context-free language, Regular language, Linear language, Finite automaton, Linear grammar, Transition diagram.*

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