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Binary generating set of the clone of idempotent aggregation functions on bounded lattices.

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Inf. Sci. 462, 367-373 (2018).

Summary: In a recent paper *M. Botur* et al. [Inf. Sci. 430–431, 39–45 (2018; Zbl 1436.06011)] we have presented a generating set of the clone of idempotent aggregation functions on bounded lattices. As the main result we have shown that this clone is generated by certain ternary idempotent functions from which all idempotent aggregation functions of L can be obtained by usual term composition. The aim of this paper is to present an essential improvement of the result above by presenting a new generating set of this clone. A bit artificial ternary functions are substituted here by natural (binary) lattice a-medians and certain binary characteristic functions. Consequently, the clone is generated by its binary part and the result strengthens the essential role of medians within all idempotent aggregation functions. Moreover, we will show that for an n-element lattice L, the upper bound of binary generators is $2n - 1$.

MSC:

08A40 Operations and polynomials in algebraic structures, primal algebras
06A15 Galois correspondences, closure operators (in relation to ordered sets)
06B05 Structure theory of lattices

Keywords:

(monotone) clone; monotone function; aggregation function; lattice; median; generating set

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