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ON MAXIMAL ANTICHAIN LATTICES OF FINITE POSETS

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This paper is devoted to maximal antichain lattices of posets of arbitrary length. Maximal antichain lattices of finite posets of length 1 have been well studied and are applied, for example, in formal concept analysis. However, there are many general properties inherent in finite posets of any length. For an arbitrary element x of some poset, we introduce the notions of smallest and largest maximal antichains containing x , which are denoted by m_x and M_x , respectively. We prove that the equality $A = \bigvee_{x \in A} m_x = \bigwedge_{x \in A} M_x$ holds for any maximal antichain A . This equality allows us to describe all irreducible elements of maximal antichain lattices. The main result of this paper is a description of all finite posets whose maximal antichain lattice is isomorphic to a given lattice. Irreducible elements play a key role in this description.

Keywords: poset, maximal antichain, maximal antichain lattice.

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