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A NEW CONDITION FOR A MODULAR LATTICE

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A lattice **L** is said to be modular if it satisfies the following axiom:

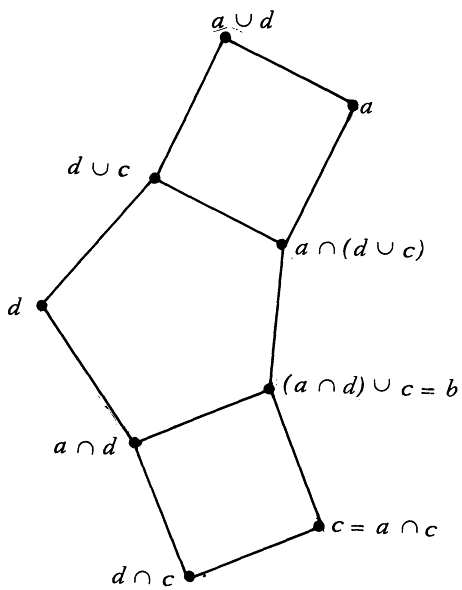
M. $[a, b, c]$: *If* $a, b, c \in \mathbf{L}$ *and* $a \geqslant c$, *then* $a \cap (b \cup c) = (a \cap b) \cup c$.

Several conditions equivalent to *M* are known. This paper introduces another characterization of a modular lattice which as far as I know has not been noted.

M'. $[a, b, c, d]$: *If* $a, b, c, d \in \mathbf{L}$, $a \cap c \leqslant b$, $a \cap d \leqslant b$, *and c is comparable to a, or c is comparable to d, then* $a \cap (c \cup d) \leqslant b$.

The expression "*a is comparable to b*" means: $a \leqslant b$ *or* $a > b$.

In the finite lattice shown below the elements are represented by dots and $x < y$ if x appears below y and is connected to y by a line segment. This lattice is known to be non-modular and we note that *M'* does not hold.



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