

Refutation of existentially closed De Morgan algebras

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We assume the method and apparatus of Meth8/VL4 with Tautology as the designated *proof* value, **F** as contradiction, **N** as truthity (non-contingency), and **C** as falsity (contingency). Results are a 16-valued truth table in row-major and horizontal, or repeating fragments of 128-tables for more variables.

LET $p, q, r, s: x, y, r, s;$
 \sim Not, \neg ; $+$ Or; $\&$ And, \wedge ; = Equivalent;
 $>$ Imply, greater than, \rightarrow ; $<$ Not Imply, lesser than;
 $\#$ necessity, for all or every, \square, \forall ; $\%$ possibility, for one or some, \diamond, \exists ;
 $(s@s)$ zero, 0; $(\%s>\#s)$ one, 1.

From: Aslanyan, V. (2018). Existentially closed De Morgan algebras. arxiv.org/pdf/1810.02335.pdf
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$$\forall x(x > 0 \rightarrow \exists y(0 < y < x)) \tag{2.1}$$

$$(\#p>(s@s))>(((s@s)<\%q)\&(\%q<\#p)) ; \mathbf{FNFN} \mathbf{FNFN} \mathbf{FNFN} \mathbf{FNFN} \tag{2.2}$$

We also evaluate the lattice complement as

$$\forall x \exists y(xy = 0 \wedge x + y = 1) \tag{3.1}$$

$$((\#p\&\#q)=(s@s))\&((p+q)=(\%s>\#s)) ; \mathbf{CNNF} \mathbf{CNNF} \mathbf{CNNF} \mathbf{CNNF} \tag{3.2}$$

Eqs. 2.2 and 3.2 as rendered are *not* tautologous. This means existentially closed De Morgan algebras are refuted.