Refutation of short circuit evaluation for propositional logic by commutative variants

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At A.4. Theorem 6.3, the four-valued truth table is for the connective "o^" as a short-circuited operator And.

We substitute the logical values \{0, 1, 2, 3\} by the 2-tuple as respectively \{00, 01, 10, 11\}:

\[
\begin{array}{cccc}
0^\wedge & 00 & 01 & 10 & 11 \\
00 & 00 & 00 & 10 & 10 \\
01 & 00 & 01 & 10 & 11 \\
10 & 10 & 10 & 10 & 10 \\
11 & 10 & 11 & 10 & 11 \\
\end{array}
\]

Our two examples are:

\[
\begin{align*}
11 \: o^\wedge \: 00 &= 10 \\
11 \: o^\wedge \: 10 &= 10 \\
\end{align*}
\]

Therefore, \(1 \: o^\wedge \: 0 = 1\) \(1 \: o^\wedge \: 1\), implying \(0 = 1\).

The truth table for \(o^\wedge\) is not bi-valent and exact but a vector space and hence probabilistic.

The short circuit evaluation for propositional logic by commutative variants is not tautologous, and thereby refuted.