Refutation of a minimal non-contingency logic system

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Abstract: We evaluate a minimal non-contingency logic system based on its unique definition which is not tautologous and hence reject it.

We assume the method and apparatus of Meth8/VŁ4 with Tautology as the designated proof value, \(\mathbf{F}\) as contradiction, \(\mathbf{N}\) as truthity (non-contingency), and \(\mathbf{C}\) as falsity (contingency). The 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables. (See ersatz-systems.com.)

\[
\begin{align*}
\text{LET} & \quad p: A; \\
& \quad \neg \text{Not}, \neg; \quad + \text{Or}, \lor; \quad - \text{Not Or}; \quad \& \text{And}, \land; \quad \\neg \text{Not And}; \\
& \quad > \text{Imply}, \rightarrow, \vdash; \quad < \text{Not Imply}, \in, \in \in \in ; \\
& \quad = \text{Equivalent}, \equiv, \equiv \equiv \equiv ; \quad \@ \text{Not Equivalent}, \neq ; \\
& \quad \% \text{possibility}, \text{for one or some}, \exists, \emptyset, M; \quad \# \text{necessity}, \text{for every or all}, \forall, \Box, L; \\
& \quad (p=p) \quad \text{T as tautology}; \quad (p\oplus p) \quad \mathbf{F} \text{as contradiction}; \\
& \quad (%p<#p) \quad \mathbf{C} \text{as contingency}, \Delta; \quad (%p>#p) \quad \mathbf{N} \text{as non-contingency}, \nabla; \\
& \quad \neg (y < x) \quad (x \leq y), \quad (x \leq y).
\end{align*}
\]


Our base language is that of classical propositional logic with \(\lor\) and \(\neg\) as primitive connectives. We add two “modal” connectives, \(\Delta\) and \(\nabla\), for contingency and noncontingency, respectively. To facilitate comparison with [3] (Humberstone, I. L. (1995). The logic of non-contingency. Notre Dame Journal of Formal Logic. 36: 214-29.), we take noncontingency as primitive and define contingency by the condition:

\[
\nabla A = \neg \Delta A. \tag{1.1}
\]

\[
((%p>#p)\&p)=\neg((%p<#p)\&p); \quad \text{FIFT FIFT FTFT FTFT} \tag{1.2}
\]

Eq. 1.2 as rendered is not tautologous, hence rejecting the conjecture of a minimal non-contingency logic.

What follows is that a subsequent, derivative work is also flawed: Humberstone, L. (2002). The modal logic of agreement and noncontingency. Notre Dame Journal of Formal Logic. 43: 95-127. Lloyd.Humberstone@arts.monash.edu.au