Refutation of algorithm for 3-SAT satisfiability via claimed Boolean rules

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Abstract: We evaluate a definition of two Boolean rules claimed for intersection and union as *not* tautologous. This refutes the subsequent conjecture of an algorithm for 3-SAT satisfiability, to form *non* tautologous fragments of the universal logic VŁ4.

We assume the method and apparatus of Meth8/VŁ4 with `T`autology as the designated proof value, **`F`** as contradiction, `N` as truthity (non-contingency), and `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.)

LET ~ Not, ¬ ; + Or, ∨, ∪, ⊔ ; - Not Or; & And, ∧, ∩, ⊓ , · , ⊗ ; \ Not And;
\> Imply, greater than, →, ⇒ , ↦, ≻, ⊃, ↠ ; < Not Imply, less than, ∈, ≺, ⊂, ⊬, ⊭, ↞, ≲ ;
= Equivalent, ≡, :=, ⇔, ↔, ≜, ≈, ≃ ; @ Not Equivalent, ≠, ⊕;
% possibility, for one or some, ∃, ◊, M; # necessity, for every or all, ∀, □, L;
(z=z) `T` as tautology, ⊤, ordinal 3; (z@z) **`F`** as contradiction, Ø, Null, ⊥ , zero;
(%z>#z) `N` as non-contingency, Δ, ordinal 1; (%z<#z) `C` as contingency, ∇, ordinal 2;
~(y < x) (x ≤ y), (x ⊆ y), (x ⊑ y); (A=B) (A~B).
Note for clarity, we usually distribute quantifiers onto each designated variable.

From: Flint, O.; Wickramasinghe, A.; Brasse, J.; Fowler, C. (2019). Determining satisfiability of 3-SAT in polynomial time. vixra.org/pdf/1908.0630v1.pdf [no point of contact with claim of peer review]

Abstract In this paper, we provide a polynomial time (and space), algorithm that determines satisfiability of 3-SAT. The complexity analysis for the algorithm takes into account no efficiency and yet provides a low enough bound, that efficient versions are practical with respect to today's hardware. We accompany this paper with a serial version of the algorithm without non-trivial efficiencies ...

2 Preliminaries and definitions

Before we work through an example, we must define what it means to take an intersection or union of two or more edge-sequences. No intersections or unions are taken with vertex-sequences.

Definition 2.12. We take the intersection or union of two n length edge sequences, A and B, by comparing position i of A and B, using the Boolean rules for intersections (denoted by ∩), and unions (denoted by ∪), for all positions, i = 0, 1, 2, . . . , n−1.
Recall that the entry for position i of A and B, is either 1 or 0.
Then, for an intersection, we have:

$$1_A \cap 0_B = 0_A \cap 1_B = 0_A \cap 0_B = 0. \text{ And } 1_A \cap 1_B = 1. \qquad (2.12.1.1)$$

LET p, q, r, s: 1_A, 1_B, 0_A, 0_B;
0 **`F`**; ordinal 1 `N`.

((((p&s)=(r&q))=(r&s))=(s@s))&((p&q)=(%s>#s)) ;
`CCCN CC`**`FF`** `C`**`F`**`C`**`F`** **`F`**`CC`**`F`** (2.12.1.2)

Remark 2.12.1.2: If instead of ordinal 1 `N`, ordinal 1 as `T`, then the equation fares worse as a contradiction:

((((p&s)=(r&q))=(r&s))=(s@s))&((p&q)=(s=s)) ;
FFFF FFFF FFFF FFFF (2.12.1.3)

And for a union we have:

$$1_A \cup 0_B = 0_A \cup 1_B = 1_A \cup 1_B = 1. \text{ And } 0_A \cup 0_B = 0. \quad (2.12.2.1)$$

((((p+s)=(r+q))=(r+s))=(s=s))&((r+s)=(s@s)) ;
FTT**F FFFF FFFF FFFF** (2.12.2.2)

Eqs. 2.12.1.2 and 2.12.2.2 are not tautologous. This refutes the claimed Boolean rules and hence refutes an algorithm which determines satisfiability of 3-SAT.