

Refutation: neutrosophic logic by Florentin Smardanche as generalized intuitionistic, fuzzy logic

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We rely on:

Smarandache, F. 2010. Neutrosophic Logic - A Generalization of the Intuitionistic Fuzzy Logic.
vixra.org/abs/1004.0008; vixra.org/pdf/1004.0008v2.pdf
arxiv.org/ftp/math/papers/0303/0303009.pdf

We assume the apparatus and method of Meth8/VL4.

Definition	Axiom	Symbol	Name	Meaning	2-tuple	Ordinal
1	$p=p$	T	Tautology	proof	11	3
2	$p@p$	F	Contradiction	absurdum	00	0
3	$\%p>\#p$	N	Non-contingency	truth	01	1
4	$\%p<\#p$	C	Contingency	falsity	10	2

LET: \sim Not; $\&$ And; \setminus Not And; $+$ Or; $-$ Not Or;
 $>$ Imply, greater than; $>$ Not Imply, less than; $=$ Equivalent to;
 $\#$ necessity, for all; $\%$ possibility, for some (one); $(p-p)$ zero; $(p\setminus p)$ one;
 $q>(p-p)$ $q>zero$; $q<(p\setminus p)$ $q<one$; $q=(p-p)$ $q=zero$; $q=(p\setminus p)$ $q=one$

The designated *proof* value is T(autology). The 16-valued result table is presented in row-major and horizontally.

For neutrosophic logic (N), we map the respective values of truth, falsity, and indeterminacy as:

$$N_t (\%p>\#p); N_f (\%p<\#p); N_i (((\%p>\#p)+(\%p<\#p))+\sim((\%p>\#p)+(\%p<\#p))). \quad (1.1)$$

We simplify our evaluation by ignoring the numeric scaling factor of lower-case_epsilon ϵ . That serves to push a single numeric value of the combined, summed state of $N_t+N_i+N_f$ outside an interval definition of q on $]0,1[$ and into $]0,3[$, or ultimately to natural numbers, including a number zero.

$$\#(((q>(p-p))\&(q<(p\setminus p)))+((q=(p-p))+q=(p\setminus p)))) > \quad \text{TCTT TCTT TCTT TCTT} \quad (1.2)$$

$$\% (q=(((\%p>\#p)+(\%p<\#p))+\sim((\%p>\#p)+(\%p<\#p)))) ;$$

In Eq. 1.2 the antecedent establishes the necessity of $0 \leq q \leq 1$.

In Eq. 1.2 the consequent establishes the possibility that q is the summation of $N_t+N_i+N_f$.

In Eq. 1.2 the result of the literal is *not* tautologous, meaning neutrosophic logic is refuted and hence its use as a generalization of intuitionistic, fuzzy logic is likewise unworkable.

We expand our evaluation by including more neutrosophic values for absolute truth $+1$, absolute falsity -0 , and absolute indeterminacy on the interval written $] -0,1+[$, as respectively:

$$N+t (\#p>\#p); N+f (\#p<\#p); N+i (((\#p>\#p)+(\#p<\#p))+\sim((\#p>\#p)+(\#p<\#p))). \quad (2.1)$$

We substitute values of Eq. 2.1 into Eq. 1.2.

$$\begin{aligned} &\#(((q<(p-p))\&(q>(p\backslash p)))+((q=(p-p))+q=(p\backslash p)))) > \\ &\% (q=(((\#p>\#p)+(\#p<\#p))+\sim((\#p>\#p)+(\#p<\#p))))); \quad \text{TCTT TCTT TCTT TCTT} \end{aligned} \quad (2.2)$$

In Eq. 2.2 the antecedent establishes the necessity of $1 \leq q \leq 0$.

In Eq. 2.2 the consequent establishes the possibility that q is the summation of $(N+t) + (N+i) + (N+f)$.

In Eq. 2.2 the result of the literal is *not* tautologous, with the same table result as in Eq. 1.2 and generalization as likewise unworkable.