Refutation of intuitionistic fuzzy decision-making in the Dempster-Shafer structure

Abstract: A pair of intuitionistic fuzzy values (IFVs) are compared and *not* tautologous, refuting the conjecture of the title and forming a *non* tautologous fragment of the universal logic VŁ4.

We assume the method and apparatus of Meth8/VŁ4 with Tautology 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.

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I. Introduction

[A] pair of IFVs [intuitionistic fuzzy values] can be compared ... as:

if *S(xi)>S(xj)*, then *xi* is better than *xj*,
if *S(xi)>S(xj)*, then
if *H(xi)=H(xj)*, then *xi* is equal to *xj*,
if *H(xi)<H(xj)*, then *xj* is better than *xi*. (1.1)

LET p, q, r, s: *xi, xj, H, S.*

(((s&p)>(s&q))>(p>q))&
(((s&p)>(s&q))>((((r&p)=(r&q))>(p=q))&(((r&q)<(r&q))>(q<p)))) ;
T**FF**T T**F**TT TT**F**T TTTT (1.2)

Eq. 1.2 as rendered is *not* tautologous, refuting the conjecture of the title.