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1. (a) $s(\{a\}) = 7/10$

$s(\{a,b\}) = 2/5$

$s(\{a,c,e\}) = 1/5$

(b) $c(\{a,c\} \to \{e\}) = 2/3$

$c(\{e\} \to \{a,c\}) = 1/4$
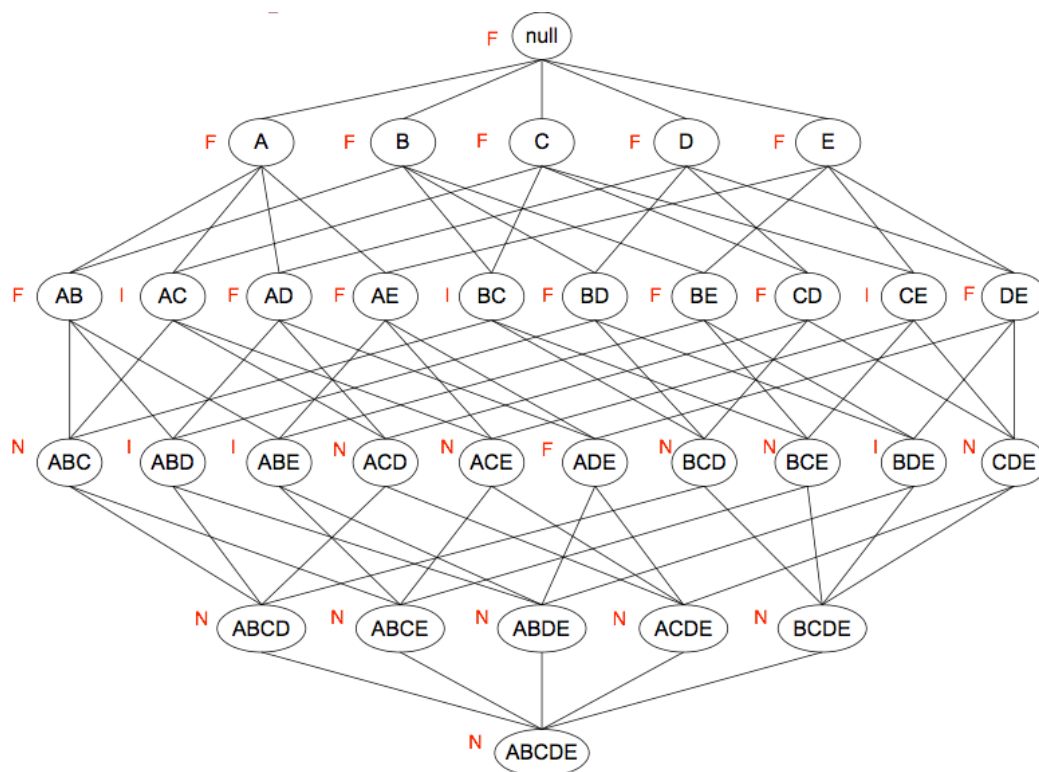
No, confidence is not a symmetric measure.

(c) $s(\{a\}) = 4/5$

$s(\{a,b\}) = 4/5$

$s(\{a,c,e\}) = 2/5$

2.(a)

(b) $14/32 = 7/16$

(c)N=12, so 12/32=3/8

(d)I=6, so 6/32=3/16

3.(a)s(A)=10/200=0.05;s(B)=10/200=0.05;s(A,B)=9/200=0.045;

$I(A,B)=P(A,B)/[P(A)*P(B)]=18$;

$\phi= [P(A, B) − P(A)P(B)]/[P(A)P(B)(1−P(B))(1−P(A))]1/2=0.89$

c(A→B)=9/10=0.9

c(B→A)=9/10=0.9

(b) s(A)=19/20=0.95;s(B)=19/20=0.95;s(A,B)=189/200=0.945;

$I(A,B)=P(A,B)/[P(A)*P(B)]=1.05$;

$\phi= [P(A, B) − P(A)P(B)]/[P(A)P(B)(1−P(B))(1−P(A))]1/2=0.89$

c(A→B)=189/190=0.99

c(B→A)=189/190=0.99

(c) Interest, support, and confidence are non-invariant while the ϕ-coefficient is invariant under the inversion operation. This is because ϕ-coefficient takes into account the absence as well as the presence of an item in a transaction.

4.(a)No, the ws>1;

(b)Yes.

5.(a)One

(b)Three