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CSEC-472

2.1.1 $A = \{1,2,3,4\}$ $T = \{(1,1),(2,1),(3,3),(4,4),(3,4)\}$

$U = \{(2,4),(1,3),(3,3),(3,2)\}$

d. $T \cup U = \{(1,1),(2,1),(2,4),(1,3),(3,2),(4,4),(3,2),(3,4)\}$

e. $T \cap U = \{(3,3)\}$

f. $T - U = \{(1,1),(2,1),(4,4),(3,4)\}$

g. $U \circ T = \{(1,3),(2,3),(3,2)\}$

2.2.1 a. $((p \wedge \neg q) \supset (\text{cal controls } r))$

Form $\rightsquigarrow$ Form $\supset$ (Prime Controls PropVar

Form $\rightsquigarrow$ PropVar $\wedge$ Form $\supset$ (Prime controls PropVar)

Form $\rightsquigarrow$ $(p \wedge \neg q) \supset$ (Prime controls PropVar)

Form $\rightsquigarrow$ $(p \wedge \neg q) \supset$ (PName controls PropVar)

Form $\rightsquigarrow$ $(p \wedge \neg q) \supset$ (cal controls PropVar)

Form $\rightsquigarrow$ $(p \wedge \neg q) \supset$ (cal controls r)

e. (UIF controls (Vic | Wes $\Rightarrow$ Tor))

Form $\rightsquigarrow$ (Prime controls (Prime | Form))

Form $\rightsquigarrow$ (PName controls (PName | Form))

Form $\rightsquigarrow$ (UIF controls (Vic | Form))

Form $\rightsquigarrow$ (UIF controls (Vic | Prime $\Rightarrow$ Prime))

Form $\rightsquigarrow$ (UIF controls (Vic | PName $\Rightarrow$ PName))

Form $\rightsquigarrow$ (UIF controls (Vic | Wes $\Rightarrow$ Tor))

2.3.1 $J_0(IDa) = \{(su, sc), (sc, sw), (ns, sc), (ns, ns)\}$

$J_0(Hal) = \{(su, su), (sc, sw), (ns, ns)\}$

$J_0(Gil) = \{(su, sw), (sc, sc), (ns, ns)\}$

a. $J_0(Hal \ \& \ Gil) = \{(su, sw), (sc, sw), (ns, ns), (sc, sc)\}$

b. $J_0(Gil \mid Hal) = \{(su, sw), (sc, sw), (ns, ns)\}$

d. $J_0(Hal \mid IDa) = \{(sw, sc), (sw, sc), (nc, sc)\}$

2.3.2 $W = \{w_0, w_1, w_2\}$

$I(s) = \{w_1, w_2\}$

$I(i) = \{w_2\}$

$J(cy) = \{(w_1, w_0), (w_1, w_1), (w_2, w_2)\}$

$J(D_i) = \{(w_0, w_1), (w_1, w_0), (w_2, w_2)\}$

a. $S \supset t = (W - Ext[\![S]\!]) \cup (Ext[\![t]\!]) = \{w_0\} \cup \{w_2\} = \{w_0, w_2\}$

b. $\neg(S \supset t) = W - \{w_0, w_2\} = \{w_1\}$

c. $C_y \ says \ (S \supset t) = \{w \mid J(cy)(w) \subseteq \{w_0, w_2\}\} = \{\emptyset\}$

d. $C_y \ says \neg(S \supset t) = \{w \mid J(cy)(w) \subseteq \{w_1\}\} = \{\emptyset\}$