Natural Language Rules

#1: When visibility is not less than 200 meters, cars are allowed to travel at speeds exceeding 30 km/h.

#2: When visibility is less than 200 meters, cars are not allowed to exceed speeds of 30 km/h.

#3: When visibility is less than 200 meters, cars are allowed to travel.

Basic Events

a: visibility < 200 meters
b: cars travel
c: cars' speeds > 30 km/h
d: visibility < 200 meters
e: cars travel
f: cars' speeds > 30 km/h
g: visibility < 200 meters
h: cars travel

Rules

$$r_1 = \neg a \rightarrow (b \wedge c) = a \vee (b \wedge c)$$

$$r_2 = d \rightarrow \neg(e \wedge f) = \neg d \vee \neg(e \wedge f)$$

$$r_3 = g \rightarrow h = \neg g \vee h$$

Similarity Examination

Basic Events

$$e_1 = a = d = g$$
$$e_2 = b = e = h$$
$$e_3 = c = f$$

Rules

$$r_1 = e_1 \vee (e_2 \wedge e_3)$$
$$r_2 = \neg e_1 \vee \neg e_2 \vee \neg e_3$$
$$r_3 = \neg e_1 \vee e_2$$

Consistency Verification

$$CNF = \bigwedge_{i=1}^{3} r_i = r_1 \wedge r_2 \wedge r_3$$
$$= \big(e_1 \vee (e_2 \wedge e_3)\big) \wedge (\neg e_1 \vee \neg e_2 \vee \neg e_3) \wedge (\neg e_1 \vee e_2)$$

When e_1 is false, e_2 and e_3 are true, the CNF can be satisfied. So this rule library is consistent.