

Resolution Problem Solving

Problem

- **Task :** For the given situation described in English, convert it into its equivalent FOL representation and prove that “West is a criminal”
- **Situation :** “The law says that it is a crime for an American to sell weapons to hostile nations.

The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel west, who is an American

1. It is a crime for an American to sell weapons to hostile nations.
 $\forall x, y, z \text{ American } (x) \wedge \text{Weapon } (y) \wedge \text{Nation } (z) \wedge \text{Hostile } (z) \wedge \text{Sells } (x, y, z) \Rightarrow \text{Criminal } (x)$
2. Nono....has some missiles
 $\exists x \text{ Owns } (\text{Nono}, x) \wedge \text{Missile } (x)$
3. All of its missiles were sold to it by Colonel west.
 $\forall x \text{ Owns } (\text{Nono}, x) \wedge \text{Missile } (x) \Rightarrow \text{Sells } (\text{West}, x, \text{Nono})$
4. We will also need to know that missiles are weapons.
 $\forall x \text{ Missile } (x) \Rightarrow \text{Weapon } (x)$
5. An enemy of America counts as hostile.
 $\forall x \text{ Enemy } (x, \text{America}) \Rightarrow \text{Hostile } (x)$

6. West, who is an American
American (West)
7. Nono, is a nation
Nation (Nono)
8. Nono, an enemy of America
Enemy (Nono, America)
9. America is a nation
Nation (America)

1. $\sim \text{American}(x) \vee \sim \text{Weapon}(y) \vee \sim \text{Sells}(x, y, z) \vee \sim \text{Hostile}(z) \vee \text{Criminal}(x)$
- 2 a. $\text{Owns}(\text{Nono}, M1)$
 - b. $\text{Missile}(M1)$
3. $\sim \text{Missile}(x) \vee \sim \text{Owns}(\text{Nono}, x) \vee \text{Sells}(\text{West}, x, \text{Nono})$
4. $\sim \text{Missile}(x) \vee \text{Weapon}(x)$
5. $\sim \text{Enemy}(x, \text{America}) \vee \text{Hostile}(x)$
6. $\text{American}(\text{West})$
7. $\text{Enemy}(\text{Nono}, \text{America})$

