

B is the upper hand on the

————— x ————— x —————

Tutorial 10

Q1]

- ① John likes all kinds of food.
 - ② Apples are food.
 - ③ Chicken is food.
 - ④ Anything animal eats and is not killed by is food.
 - ⑤ Bill eats peanuts and is still alive.
 - ⑥ Aparna eats everything, Bill eats.
- a) Translate into Predicate logic
 - b) Prove that John likes peanuts using res
 - c) Use resolution to answer the question: What food does Aparna eat.

$\forall x \text{ likes}(\text{John}, x) \Leftrightarrow \text{food}(x)$

$\text{food}(\text{Apples})$

$\text{food}(\text{Chicken})$

$\forall x \forall y \text{ eats}(\text{Animal}, x) \wedge \text{not killed by}(\text{Animal}, x) \Rightarrow \text{Food}$

$\text{eats}(\text{Bill}, \text{Peanuts}) \wedge \text{not killed by}(\text{Bill}, \text{Peanuts})$

$\Rightarrow \text{alive}(\text{Bill})$

$\forall x \text{ eats}(\text{Bill}, x) \Rightarrow \text{eats}(\text{Aparna}, x)$

$$\begin{array}{l}
 \forall x \text{ food}(x) \Rightarrow \text{likes}(\text{John}, x) \\
 \downarrow \\
 \forall x \neg \text{food}(x) \Rightarrow \forall x \text{ likes}(\text{John}, x) \\
 \downarrow \\
 \neg \text{food}(x1) \vee \text{likes}(\text{John}, x1) \quad (1)
 \end{array}$$

$\text{food}(\text{Apples})$ $\text{food}(\text{Chicken})$

$$\forall x, y \text{ eats}(y, x) \wedge \neg \text{not killed by}(y, x) \Rightarrow x$$

$$\forall x, y \neg \text{eats}(y, x) \wedge \neg \text{not killed by}(y, x) \vee \text{food}(x)$$

$$\forall x, y \{ \neg \text{eats}(y, x) \vee \neg \text{not killed by}(y, x) \} \vee \text{food}(x)$$

$$\neg \text{eats}(y1, x2) \vee \neg \text{not killed by}(y1, x2) \vee \text{food}(x2) \quad (4)$$

$$\text{eats}(\text{Bill}, \text{Peanuts}) \wedge \neg \text{not killed by}(\text{Bill}, \text{Peanuts}) \Rightarrow \text{alive}(\text{Bill})$$

$$\neg \text{eats}(\text{Bill}, \text{Peanuts}) \vee \neg \text{not killed by}(\text{Bill}, \text{Peanuts}) \vee \text{alive}(\text{Bill}) \quad (5)$$

$$\forall x \text{ eats}(\text{Bill}, x) \Rightarrow \text{eats}(\text{Aparna}, x)$$

$$\neg \text{eats}(\text{Bill}, x3) \vee \text{eats}(\text{Aparna}, x3) \quad (6)$$

$$\neg \text{likes}(\text{John}, \text{Peanuts}) \quad (1) \quad \neg \text{eats}(\text{Aparna}, a) \quad (6)$$