

## Who killed Tuna?

Knowledge Base:

$\text{Loves}(\text{Jack}, y) \wedge \text{Animal}(y)$

$\text{Loves}(x, y) \wedge \text{Animal}(y) \rightarrow \neg \text{Kills}(x, y)$

$\text{Kills}(\text{Jack}, \text{Cat}(\text{Tuna})) \vee \text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna}))$

$\text{Cat}(\text{Tuna})$

CNF conversion:

$\text{Loves}(x, y) \wedge \text{Animal}(y) \rightarrow \neg \text{Kills}(x, y) \equiv \neg [\text{Loves}(x, y) \wedge \text{Animal}(y)] \vee \neg \text{Kills}(x, y)$

$\alpha = \text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna}))$

$\neg \alpha = \neg \text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna}))$

$\text{KB} \wedge \neg \alpha \equiv$

$\text{Loves}(\text{Jack}, y) \wedge \text{Animal}(y) \vee \neg [\text{Loves}(x, y) \wedge \text{Animal}(y)] \vee \neg \text{Kills}(x, y) \vee \text{Kills}(\text{Jack}, \text{Cat}(\text{Tuna})) \vee$   
 $\text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna})) \vee \neg \text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna}))$

$\text{Loves}(\text{Jack}, y) \wedge \text{Animal}(y) \vee \neg [\text{Loves}(x, y) \wedge \text{Animal}(y)] \vee \neg \text{Kills}(x, y) \vee \text{Kills}(\text{Jack}, \text{Cat}(\text{Tuna}))$

$x = \text{Jack}$

$y = \text{Cat}(\text{Tuna})$

$\text{Loves}(\text{Jack}, \text{Cat}(\text{Tuna})) \wedge \text{Animal}(\text{Cat}(\text{Tuna})) \vee \neg [\text{Loves}(\text{Jack}, \text{Cat}(\text{Tuna})) \wedge \text{Animal}(\text{Cat}(\text{Tuna}))] \vee$   
 $\neg \text{Kills}(\text{Jack}, \text{Cat}(\text{Tuna})) \vee \text{Kills}(\text{Jack}, \text{Cat}(\text{Tuna}))$

$= \{\}$

Thus we reject:  $\neg \alpha = \neg \text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna}))$

But accept:  $\alpha = \text{Kills}(\text{Curiosity}, \text{Cat}(\text{Tuna}))$