AI
Assignment-1

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1BM18CS065
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1) FOL into CNF

$\forall x [\exists z \text{ Animal}(z) \wedge \text{Kills}(x,z)] \Rightarrow [\forall y \neg \text{Loves}(y,x)]$

Sol:: $\forall x [\neg \exists z \neg \{(\text{Animal}(z) \wedge \text{kills}(x,z)\}] \vee [\forall y \neg \text{Loves}(y,x)]$

$\forall x [\neg \exists z \neg \text{Aimal}(z) \vee \neg \text{Kills}(x,z)] \vee [\forall y \neg \text{Loves}(y,x)]$

$\forall x [\forall z \neg \text{Animal}(z) \vee \neg \text{Kills}(x,z)] \vee [\forall y \neg \text{Loves}(y,z)]$

$\forall x \forall y \forall z [\neg \text{Aimal}(z) \vee \neg \text{kills}(x,z)] \vee [\neg \text{Loves}(y,z)]$

$\forall x [\neg \text{Animal}(G(x)) \vee \neg \text{kills}(x, G(x))] \vee [\neg \text{Loves}(F(x), x)]$

$[\neg \text{Aimal}(G(x)) \vee \neg \text{Kills}(x, G(x))] \vee [\neg \text{Loves}(F(x), x)]$

$[\neg \text{Animal}(G(x)) \vee \neg \text{Loves}(F(x), x)] \vee [\neg \text{kills}(x, g(x)) \vee \neg \text{Loves}(F(x), x)]$

2) Convert the sentences into FOL & prove using resolution:-

i) Cold and precipitation → snow

$cold(x) \wedge precipitation(x) \Rightarrow snow(x)$

$\neg (cold(x) \wedge precipitation(x)) \vee snow(x)$

$\neg cold(x) \vee \neg precipitation(x) \vee snow(x)$

ii) January → cold

$January(x) \Rightarrow cold$ $\quad \neg January(x) \vee cold(x)$

iii) clouds → precipitation

$clouds(x) \Rightarrow precipitation(x)$ $\quad \neg Clouds(x) \vee precipitation($

iv) $January(x)$ $\quad$ v) $Clouds(x)$

To prove:- $Snow(x)$

→ Resolution of (i) & (ii)

vi) $\neg Precipitation(x) \vee snow(x) \vee \neg January(x)$

→ Resolution of (vi) & (iv)

vii) $\neg Precipitation(x) \vee Snow(x)$

→ Resolution of (vii) & (iii)

viii) $Snow(x) \vee \neg Clouds(x)$

→ Resolution of (viii) & (v)

$Snow(x)$ $\quad$ Hence proved