

# Introduction to AI -Tutorial Logic for KRR -

Assignment Project Exam Help

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# Colonel West again

$\text{Criminal}(x) \leftarrow \text{American}(x), \text{Weapon}(y), \text{Sells}(x, y, z), \text{Hostile}(z)$

$\text{Owns}(\text{Nono}, \text{M1})$

$\text{Missile}(\text{M1})$

$\text{Sells}(\text{West}, x, \text{Nono}) \leftarrow \text{Owns}(\text{Nono}, x)$

$\text{American}(\text{West})$

$\text{Weapon}(x) \leftarrow \text{Missile}(x)$

$\text{Hostile}(x) \leftarrow \text{Enemy}(x, \text{America})$

$\text{Enemy}(\text{Nono}, \text{America})$

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- 1) Compute using SLD resolution all possible answers for the query  $(\exists x) \text{Criminal}(x)$
- 2) Give the minimal Herbrand model of this set of definite clauses
- 3) Let  $S$  be the set of all these clauses. Determine  $T_S \uparrow^1$ ,  $T_S \uparrow^2$  and  $T_S \uparrow^3$  and the least fixed point of  $T_S$

# Search for solutions by SLD resolution

Admires(Ann, Bob)   Admires(Ann, Carla)   Admires(x,y) ←  
Lecturer(x), Lecturer(y)  
Lecturer(Ann)   Lecturer(Dave)   Lecturer(Eric)  
Rich(Carla)   Rich(Eric)   Rich(Ann) ← Rich(Carla)  
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Which rich person does Ann admire?

Formulate this query and compute all possible answers obtainable by SLD resolution, using depth-first search with backtracking. Show all failed attempts explicitly.

# More on search for solutions by SLD resolution

Consider the set of definite clauses (written using logic programming notation: variables start with capital letters)

$S = \{ p(X) \leftarrow q(X,Y), r(Y), q(2,3) \leftarrow, q(2,4) \leftarrow, r(4) \leftarrow, r(3) \leftarrow r(3) \}$

and query  $p(X)$ . Apply 1 step of SLD resolution to obtain  $q(X,Y), r(Y)$ :

1) Does it matter in which order  $q(X,Y)$  and  $r(Y)$  are selected for determining an answer?

2) Does it matter in which order clauses are chosen for determining an answer?