

se 47/472  
 Example (ex. 8.13 extended)

$F = R(a, X, b, Y, a, X) \wedge S(X, Z, a) \wedge Y = \text{"D"} \wedge X = Y \wedge Z < 3$

positive literal:  $X = Y$

$\sigma[Y = \text{"D"}] \wedge X = Y \wedge Z < 3$

$\pi[X, Y]$   
 $S[\$2 = X, \$1 \rightarrow Y]$   
 $\sigma[\text{"D"} \wedge \$3 = b \wedge \$5 = a \wedge \$1 = \text{"D"} \wedge \$2 = \$6]$   
 $R$

$\pi[X, Z]$   
 $\rho[\$1 = X, \$2 \rightarrow Z]$   
 $\sigma[\$3 = a] \wedge \$2 < 3$   
 $S$

later, algebraic optimization:

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Classical First-Order Logic Model Theory:

$\varphi \models \psi$

holds if for all  $\mathcal{J}$  s.t.  $\mathcal{J} \models \varphi$ ,  $\mathcal{J} \models \psi$

- Classical FOL Reasoning
- Open World Model Theory
  - Monotonic

vs. Datalog: Closed-world Model Theory (answers)

Program  $P$ :  $P \models$  set of answers

$\Delta$  different model theory than in FOL

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