

Advanced Data Modeling

Summer Semester 2009

- Exercises 5 -

To be handed in before **2009-06-16, 23:59** via e-mail to
bercovici@uni-koblenz.de And dividino@uni-koblenz.de, subject line: [ADM] ...

1. Are the following formulas unifiable? If yes show the respective unifier:

1. $\{p(f(a),a), p(y, f(w))\}$

2. $\{p(f(x),z), p(y, a)\}$

2. Suppose Θ_1 and Θ_2 are substitutions and there exist substitutions σ_1 and σ_2 , such that $\Theta_1 = \Theta_2 \sigma_1$ and $\Theta_2 = \Theta_1 \sigma_2$. Show that there exists a variable-pure substitution γ , such that $\Theta_1 = \Theta_2 \gamma$.

3. Compute the least Herbrand models of the following programs using the immediate consequence operator T_P .

1. $p(X,a) :- q(X).$

$p(X,Y) :- q(X), r(Y).$

$q(a).$

$r(b).$

$q(b).$

$r(c).$

2. $p(f(X)) :- p(X).$

$p(a).$

$q(a).$

$q(b).$

3. $p(a) :- p(x), q(x).$

$p(f(x)) :- p(x).$

$q(b).$

$q(f(x)) :- q(x).$

4. $p(a).$

$p(b).$

$q(c).$

$q(x) :- \text{not } r(x,b).$

$r(x,x) :- p(x).$