## Assignment 4

## Foundations of Logic Programming

## December 7, 2012

- 1. Write two successful SLD-derivations of the query sum(x(x), y, s(s(0)))which yield the c.a.s.s (computed answer substitutions)  $\{x \mapsto 0, y \mapsto s(0)\}$ and  $\{x \mapsto s(0), y \mapsto 0\}$
- 2. Compute the resultants of the SLD-derivation  $\xi'$  and  $\xi''$  in Slide3.
- 3. Prove the Propagation Corollary: Suppose that  $Q \Rightarrow_c^{\theta} Q_1$  and  $Q' \Rightarrow_c^{\theta'} Q'_1$  are two SLD-derivation steps such that:
  - Q is an instance of Q'
  - in Q and Q' atoms in the same positions are selected.

Then  $Q_1$  is an instance of  $Q'_1$ .

- 4. Consider two SLD-derivation steps which differ only in the choice of the variants of the input clause. Prove that the resultiong SLD-resolvents are variants of each other.
- 5. Prove Selection Note: Every SLD-derivation is via a selection rule.
- 6. Formulate a special case of Switching Lemma (for SLD-derivation steps) which applies to the SLD-derivations via the leftmost selection rule.