

Computational Logic

Assignment 3

Due: 15/03/2005

1. Prove the following theorem

Theorem 1. *Let Π be a definite propositional logic program. Then $M_{\Pi} = \text{lfp}(T_{\Pi})$*

2. Consider the following planning problem in the blocks world:

Initial state:	Goal state:
<code>on(a, table, 1)</code>	<code>on(d, table, n)</code>
<code>on(b, table, 1)</code>	<code>on(c, d, n)</code>
<code>on(d, a, 1)</code>	<code>on(b, c, n)</code>
<code>on(c, d, 1)</code>	<code>on(a, b, n)</code>
<code>clear(c, 1)</code>	<code>clear(a, n)</code>
<code>clear(b, 1)</code>	

- (a) Code the problem using the traditional representation, with classical representation of frame axioms.
- (b) Write a program in Prolog that takes as input a blocks world planning problem in the FOL representation, and produces as output the propositional coding using normal splitting, explanatory representation of frame axioms, conflict exclusion, and factoring.
- (c) Run the SAT solver you installed for assignment 2 (if your SAT solver doesn't give back a model, select another one) with the traditional representation of this problem, and with the representation obtained from the Prolog program. Compare the results.