Übungen zur Vorlesung: Wissensbasierte Systeme

## Blatt 6

Exercise 6.1:

(a)   Specify a STRIPS planner for blocksworld tranformations. Define operators stack(B1, B2) and unstack(B1, B2), where B1 and B2 are blocks, and operators pickup(B) and putdown(B) where a block B is moved from or to the table. Use the primitive predicates holding(B), on(B1, B2), ontable(B) and the derived predicates clear(B), armempty.

(b)   Simulate plan generation for the blocksworld transformation shown in the figure below using backward planning and a goal stack. Initially, the stack contains the goal situation and its conjuncts as partial goals, e.g.

on(a, b)
on(b, c)
on(a, b), on(b, c)

The goals of the stack are processed as follows: If the top goal of the stack is fullfilled in the start situation, it is deleted, else it is replaced by an action which achieves this goal, and the delete list of that action is placed on the stack as new goals (including partial goals).
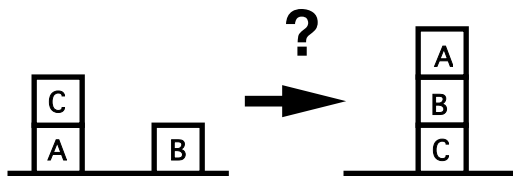
(c)   Is the planning procedure sound and complete for the blocksworld? In general?

Exercise 6.2

Suppose that you have a STRIPS representation for actions a1 and a2, and you want to define the STRIPS representation for the composite action a1-a2, which means that you do a1 then do a2.

(a)   What is the add list for this composite action?
(b)   What is the delete list?
(c)   What are the preconditions for the composite action?
(d)   Using the delivery robot domain, give STRIPS representation for the composite action
         move(Ag, Pos1, Pos2)-pickup(Ag, Obj)
(e)   Give the STRIPS representation for the composite action
         move(Ag, Pos1, Pos2)-move(Ag, Pos2, Pos1)
(f)   Give the STRIPS representation for for the composite action
         move(Ag, Pos1, Pos2)-pickup(Ag, Obj)-move(Ag, Pos2, Pos1)
(g)   Use the idea of composite actions to detect cycles in STRIPS.