Part1

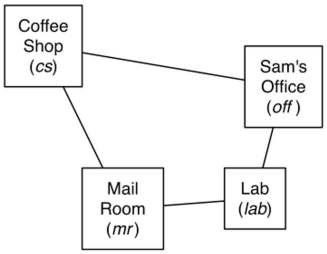
Wednesday, 20 January 2021 9:32 am

STRIPS:

- focusing on actions only
- for each action, specify
  1. precondition
  2. effect

ex. (from Tute)

Activity 1: STRIPS



Features:
RLoc – Rob's location
RHC – Rob has coffee
SWC – Sam wants coffee
MW – Mail is waiting
RHM – Rob has mail

Actions:
mc – move clockwise
mcc – move counterclockwise puc – pickup coffee
dc – deliver coffee
pum – pickup mail
dm – deliver mail

Consider the planning problem from the lectures.
(a) Give the STRIPS representations for the pick up mail (pum) and deliver mail (dm) actions.

(b) Give the feature-based representation of the MW and RHM features.

a) pick up mail action is defined using STRIPS by

Preconditions: $RLoc = mr \wedge \neg mw$

Effects: $[\neg mw, rhm]$

... try the second one yourself

b) (1) MW feature

since MW is a boolean feature already, it can be represented by

$MW = true \leftarrow mw' = true \leftarrow mw \wedge Action \neq pum$ (mw)

(2) $RHM = true$: $rhm' = true \leftarrow Action = pum$ (causal rule)

$rhm' = true \leftarrow rhm \wedge Action \neq dm$

Activity 2: STRIPS

Formulate the blocks world using STRIPS planning operators. The actions are stack (move one block to the top of another) and unstack (move one block to the table). The robot can hold only one block at a time.

To simplify the world, assume the only objects are the blocks and the table, and that the only relations are the on relation between (table and) blocks and the clear predicate on table and blocks. Also assume that it is not possible for more than one block to directly support another block (and vice versa).

Remember, STRIPS only focuses on actions.

stack(A, B):

preconditions: $clear(A) \wedge clear(B)$

effects: $on(A, B) \wedge \neg clear(B)$

unstack(A):

preconditions: $clear(A) \wedge on(A, B)$

effects: $on(A, Table) \wedge clear(B) \wedge \neg on(A, B)$