MAS: Activity 4 – Single BDI agent

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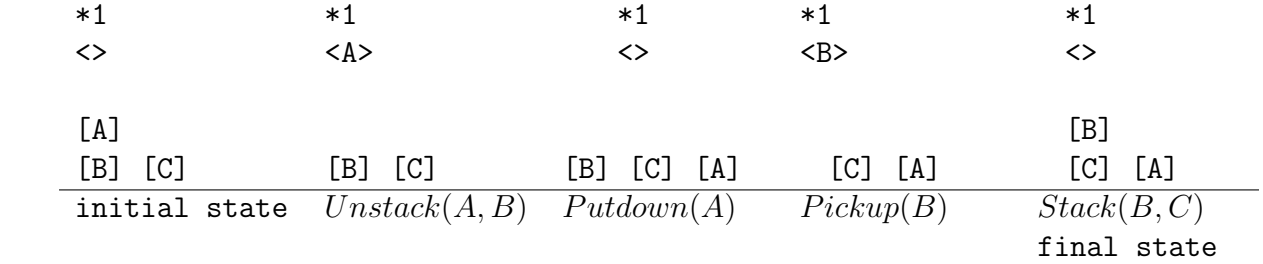
The problem: In the **blocks world**[1] an initial state is given. Blocks are identified by capital letters. Any blocks can be placed on the table ($ONTABLE(A)$) or one on top of the other ($ON(A, B)$), forming stacks. The table can hold an unlimited number of stacks. Blocks can be moved by an **arm** situated above the world. It can pick blocks and put them down, one block at a time. The arm is controlled by an **agent**, which is assigned a final goal state. The problem is solved when, by using legal operations (see below), the stacks in the target state can be found, exactly in the same configuration, in the current world. **NOTE** that the order of the stacks on the table is not relevant, only relations between blocks are.

Actions: The agent controls the arm to take a block ($Pickup(C)$ from the table or $Unstack(A, B)$) or to put it down ($Putdown(A)$ on the table or $Stack(B, C)$). If more blocks are stacked one on top of the other, only the top block can be unstacked.

Example



Inaccessible, dynamic environement. The environment is only partially **accessible**: the agent only perceives the stack it is currently over.

Heads-up: The environment will also be **dynamic** in the next activity: some blocks may change position and some blocks may be hidden temporarily.

To Do: implement a **single-minded BDI**[2] agent to solve the problem. The agent perceives the state of the current **stack** and the identifyier of the current **station**. We call *station* the physical position of a particular stack.

- Model your agent as a BDI agent, separating belief revision, option generation, and the creation of [partial] plans. Use a solution based on the Unstack-Stack method[3].
- Test the planning onto the various tests; make plans short (no obviously redundant actions).
- Display your current plan using the `statusString()` method.

Testing: Change the test suite by changing `TEST_SUITE` in `MyTester`.

[1] http://en.wikipedia.org/wiki/Blocks_world

[2] See slides 49 and 55 in Lecture 2 https://acs.curs.pub.ro/2018/mod/resource/view.php?id=11204

[3] http://ai.cs.unibas.ch/_files/teaching/hs12/search-opt-seminar/slides/08_blocks_world_revisited.pdf

Cum să raportați activitatea:

- **la sfârșitul laboratorului:** trimiteți arhiva conform cu instrucțiunile de mai jos.
- **la terminarea taskurilor** aferente laboratorului (înainte de următorul laborator, altfel cu depunctare): trimiteți din nou arhiva, conform cu aceleași instrucțiuni, eventual adăugând ceva la nume.

Conținutul arhivei: numai directorul `src`, arhivat într-o arhivă cu numele `PrenumeNume_MAS-N.zip`, unde `N` este numărul laboratorului pe care l-ați rezolvat.

Cum trimiteți: trimiteți arhiva în atașament la un mesaj către adresa cs+mas@andreiolaru.ro. Dacă adresa este corectă și există atașament, veți primi un mesaj automat de confirmare.

Notă: Folosiți adresa de mai sus numai pentru a trimite activitatea de laborator. Pentru alte probleme folosiți modalitățile de contact indicate la curs.