CSE 591 Knowledge Representation and Reasoning, Fall 2009

3. CCalc Exercises

3.1 (a) A robot with two grippers wants to move three balls from Room 1 to Room 2. Use CCalc to find a plan for doing that. (b) Assume, in addition, that the balls need to be painted in the process: originally they are all white, and at the end one should be red, one blue and one white. Red paint and blue paint are available in Room 3.

3.2 (a) You have a few quarters and a few dollar bills. A dollar changer is available. Use CCalc to find a plan for putting a given number of quarters into a parking meter. (b) Assume, in addition, that the meter has a handle that needs to be turned every time after putting a quarter in the slot.

3.3 A man wants to move a wolf, a sheep, and a box of cabbage to the other side of the lake. He can move one at each step by crossing in a boat. Notice that wolves eat sheep and sheep eat cabbages when no man is around. Use CCalc to help the man.

3.4 Modify the CCalc description of the blocks world available at

(`http://www.cs.utexas.edu/~tag/ccalc/examples/`)

to reflect the following assumptions. Moving blocks is performed by two agents—Big Robot and Little Robot. Each of them can move only one block at a time. Some blocks are heavy, and Little Robot is not capable of moving heavy blocks.