CS 461 – ARTIFICIAL INTELLIGENCE

HOMEWORK #2 (5%)

Assigned: Thu Feb 22, 2018

Due: Thu Mar 8, 2018 **2 pm**

(N.B. This is also the demo day for your minipuzzle user interface. Demos will begin at 3:40 pm (lecture hour) and will continue into the spare hour, hopefully finishing before 5:30 pm.)

You can do this homework in groups of five or less. Do not forget to indicate the students submitting the homework (i.e., at most five names).

You must email your homework (just a single submission per group) to our TA. (He will send you a brief note explaining the mechanics of submissions.)

Any of the group members should be prepared to give a demo individually when requested.

Consider the following puzzle:

> *Three soldiers have to cross a river without a bridge. Two boys with a boat agree to help the soldiers, but the boat is so small it can support only one soldier or two boys. A soldier and a boy can't be in the boat at the same time for fear of sinking it. Given that none of the soldiers can swim, it would seem that in these circumstances just one soldier could cross the river. Yet all three soldiers eventually end up on the other bank and return the boat to the boys. How do they do it?*

Solve the puzzle using Nondeterministic Search (Winston, Chapter 4). It is mandatory to hold a CLOSED list so that you don't visit the states you've already been to. Run your program several (at least 10) times. List the contents of CLOSED and the solution path in each case. Do you get the same solution always?

Your program should have a simple (textual or graphical) interface so that you (and especially the TA) can comfortably see the intermediate states of the search space and the solution as the program is 'single stepping' (expanding a state). Needless to say, this is also useful for debugging your program.

N.B. MAKE SURE THAT ANYTHING YOU SUBMIT IS MACHINE-READABLE. IF THERE IS A HANDWRITTEN ADDITION OR CORRECTION E.G. ON A PRINTOUT YOU'LL LOSE POINTS.

LATE POLICY: Late submissions will first have 1% deduced categorically. Then they'll have 1% deduced for every late day.