Mark Meade

Question 7.

The utility function for my AI works (what I believe is) logically.

First, it looks through all of the terminal states that exist in Connect4 (4 in a row in any direction, and a draw), and returns a utility of -1000 for a loss, 1000 for a win, and 0 for a draw. After this, it loops through all of the possible ‘3 in a row’ situations that can lead to either a win or a loss (if the slot in the beginning or end isn’t filled, and not the side of the board). Having 3 friendly pieces is represented by 600, and the enemy by -600. The same thing is done with 2 in a row with either the 2 pieces immediately after, before, or both (1 in front, one behind) being empty. For efficiency purposes, the step of checking ‘before’ (in this case, underneath) is removed for all vertical tests, as this isn’t possible due to the nature of Connect4. 2 in a row grants the AI 100 utility if it’s their pieces, or -100 if they’re the enemy’s. Any game states that result beyond this will cause the utility to return 0.

Disclaimer\*\*\*I am aware that my AI does not behave as described above. I cannot, and I cannot stress this enough, CANNOT figure out what is wrong with it. The utility function works as expected, so the bug must lie somewhere else. That being said, I have tested every other function individually and they work as expected. I don’t know what’s wrong here, I don’t think I ever will.

Side note, the getTurn returns opposite results, because that works for some unknown reason. The 1 and 2 that are returned in the end logically should be switched, but in practice this doesn’t work. Also, the AI works if and only if it’s player 2, and this getTurn function is modified (the way that it currently is.)