Wumpus World Final AI Report

Team name AINN

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II. Draft AI

II.A. Briefly describe your Draft AI algorithm, focusing mainly on the changes since Minimal AI:

a)MyWorld part:

1.The enum State class is represent three states: valid, satisfied, unsatisfied, for every possible inference states.
2.The private class Cell represent the cell room in the world, every cell has their own states, like visited, safe, stench, breeze, pit, wumpus, wall, and their location x and y.
3.The private class MyWorld holds the cell matrix, the wumpus has been found or not, and etc, which maintain the current knowledge base.
4.The method printWolrd() private class MyWorld support print the inference world to the console.
5.The method saveStatus() save current status into knowledge base and update the knowledge base states by calling several core methods, like markBreeze(), markStench(), etc.
6.Once found a breeze in the cell, call markBreeze(cell, true) to mark breeze in current cell, and then, according to current cell's breeze to inference the neighbors if they are possible pit by calling markNeiPit().
7.The same idea follows in finding a stench. Once found a stench, call markStench(cell, true) to mark stench in current cell and inference the neighbors by calling markNeiWumpus().
8.markNeiWumpus() and markNeiPit() to implement the logic once we need to inference neighbors.
9.markNeiPit() check neighbor cell is possible pit according to neighors' neighbors.
10.markNeiWumpus() check neighbor cell is possible wumpus according to neighbors' neighbors.

b)MyAgent part:

1. The function of calculating the path to a specific point is added. Unlike the previous function of calculating next target, this function does not consider the edge point any more. It takes the points only that have already passed to reach the destination point.
2.After grapping the gold, the agent will immediately clear the instruction queue and calculate the path to (0,0). Then it will return there and climb out.
3.When there is no way to go, Agent will calculate whether it knows the location of Wumpus and it needs to kill Wumpus. If so, Agent will try to kill Wumpus to open a new path. To do this, calculate the path to Wumpus and replace the last instruction ‘coming to Wumpus’ with ‘shoot’. If not, the agent to return to (0,0) and climb out.
4. When the agent is walking up and down, priority is given to turning left and right. This ensures that serpentine scanning is performed as much as possible, avoiding the agent from calculating out farther target points and wasting costs.

II.B. Describe your Draft AI algorithm’s performance:

We run our agent on the tournament set, the average score is 221.6, and the standard deviation is 413.4.

Cave Size	Sample size	Mean Score	Standard Deviation	99% Confidence Interval
4x4	1,000,000	284	451.4	284 ± 2.8
5x5	1,000,000	235	427.2	235 ± 3.5
6x6	1,000,000	191	400.8	191 ± 3.3
7x7	1,000,000	152	371.0	152 ± 3.0
Total Summary	4,000,000	216	412.6	216 ± 3.1