Full Name:_____

CS 4300, Fall 2019

Final

Instructions:

- Complete one task associated with each assignment. Then, complete an additional task from any one of the assignments. That's a total of 4 tasks required.
- The work completed here, and the assignment work it is based on, must be your own.

Wumpus Problems

Probability

Problem 1. (25 points):

We discussed adding risk to the Wumpus agent by allowing it to take a calculated risk when a cell's probability of containing a pit was low enough. If you implemented probability risk in your solution, then this problem is for you. If you didn't already implement it, you probably don't want to take the time now.

Task

Run your agent with risk taking disabled, on a set of 100 (or more) worlds, with the world sizes varying from 3 to 5 in each dimension. Use a pit probability of 0.2. Collect data on the number of deaths, golds, and score. Repeat with the same world parameters, including random number seed, with risk taking turned on. Collect the same data. Repeat both runs again, but with pit probability of 0.1, collecting data.
Now you have 4 sets of data to compare for risk taking vs. non-risk taking. Create a short report with this data, and your interpretation of the results. Submit the report to the Canvas task.

Nirvana

Problem 2. (25 points):

The tribe of *Supmuw* considers being eaten by a wumpus to be Nirvana, the highest obtainable state of existence. (Being eaten by the wumpus gives about the same experience as listening to grunge music.) If the wumpus is in the same location as a pit, then the adventurer would fall into the pit before being eaten. The adventurer must be sure that the wumpus isn't with a pit before walking into the wumpus' location. Nirvana is only reached if the agent yells "Cowabunga Dude!" in the last action before moving forward into the cell that contains the wumpus and no pit.

Task

Modify your wumpus agent to seek Nirvana.

- You will want to able to ask the knowledge base if Nirvana is achievable in a given cell (yes wumpus, no pit).
- Add a method to the agent the checks if the cell that is forward of the agent is Nirvana achievable. If it is, then remove any contents from the plan queue, and push a YELL action and a FORWARD action, then return true. If the forward cell is not Nirvana achievable, then do nothing and return false.
- Add to the if/else if chain in `ChooseAction()` after `if(gold > 0)` and before `else if(kb.AskGold(x,y))` an `else if` that calls your new method. If it returns true, pop an action from the queue.

Run your agent with this enabled on at least 100 worlds with the nirvana option turned on in the server: `--nirvana 1`. The server will reward the agent with 10000 points if Nirvana is obtained by yelling followed by being eaten.
Save the server error and log files, and submit them to the Canvas task. Use git to push your code.