CS-171 Wumpus World Final AI Report

Team name: NULL

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I. In about 1/2 page of text, describe what you did to make your Final AI agent "smart."

Our "smart" Final AI agent assigned each tile of the board (world) different values such as unexplored, visited/explored/safe tile, possible Wumpus, possible pit. The probability of a possible Wumpus or a possible pit is also accounted for whenever the agent encounters a stench or a breeze respectively. At starting point, our agent first checks for breeze and stench, if stench then shoots an arrow in the forward direction, if breeze then it climbs out immediately. Every time our agent moves, it first checks if the current tile has gold and if true then grabs gold and find the lowest path cost to go back to starting position and climb out. Whenever our agent encounters a stench or a breeze not at starting position, it will not shoot an arrow or climb out immediately but backtracks to the safe tiles and updates the neighboring tiles as it moves, and will only shoot at a tile if it has perceived another stench which will verify the location of the Wumpus. If the agent hears a scream, it knows that the Wumpus is dead and updates the tiles accordingly. Likewise, agent labels a tile a pit after sensing multiple nearby breeze tiles. We implemented our AI's decision of which tile to go next with depth first search, which we believe is more optimal considering the concept of Wumpus World problem.

II. In about 1/4 page of text, describe problems you encountered and how you solved them.

The major issue that we encountered during the early stages was the infinite loops that our agent some time got stuck in while backtracking to starting position or searching for next tile to move to. This led to some intense debugging sessions to solve and figure out which function was causing the problem. Sometimes, our agent will not be able to find the path to where it wants to go next, but we solved it by allowing the agent to backtrack and find the next best path. We also made many changes to our functional draft AI in order to get it over 200 and preferably over 210. We encountered some minor problems when we first read the prompt and decide how to implement our AI agent. Even then, we still had to figure out how and what functions needed to be implemented to fit our initial algorithm for the AI, which was also a big challenge and time-consuming.

III. In about 1/4 page of text, provide suggestions for improving this project.

We like the openness of this project as it does not limit how the AI agent is implemented and everyone has their own unique method of implementing their AI to compete in the tournament in class. We also like that some of the lectures are specifically designed to help students get a better understanding of the project. I think it would be better if we get more lectures that are closely related to the Wumpus World project which I think would help students immensely in starting off their project in the right direction. But overall we enjoyed the thought process involved and the algorithm/optimization that students have to come up with to make their AI work. We learned a lot from doing this project, from planning, implementing, debugging, and optimizing our code to achieve better result.