CS-171 Wumpus World Final AI Report

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

In order to make my Final AI smart, I used the minimum cost search to find out the next safe square with the minimum cost. Each time before the search, the AI will update the information based on the current information it received. The information will based on the breezeMap, pitMap and stenchMap and whether the wumpus is killed or found. There are various logic will help the AI determine the next move and identify whether a space is safe or not. If the birth location have stench without a breeze, the AI will shoot to the front. If the shoot killed the wumpus, the AI will ignore all the stench and the stenchMap will not be used to determine the next move. Otherwise, the Wumpus must be at square (1,2) since that will be the only location that Wumpus can stay. If there are three stench in the map or two with a safe square between them, the AI will know the location of the Wumpus. The location of the Wumpus will be stored in a tabulist to avoid meet the Wumpus. The determine of pit will also base on the same logic. This improvement helped the AI score increased 70 points. Each potential step will be store in an action list and the minimum cost search will determine the priority of each move. In order to reach all possible square, the AI use depth first search to access all potential move. When the AI receive the gold, it will use the minimum cost search to back to the starting square and climb. The process will aviod the square that in the tabulist and handle by the dangerous move function.

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

There are various problems during the process while develop the AI. The first problem is that even the AI have the gold, it still explore each unvisited place before climb up. In order to fix this, we decide to interrupt the search if the AI hold the gold by call self.gogo((1,1)), which force the AI back to the starting point directly. This make the AI has less unnecessary steps but have another problem, if the path to go back have a wumpus or a pit, the AI will fall down. This is a problem in the gogo function that there wasn't a tabulist to prevent an illegal move. Thus we created a function to handle dangerous move and create a tabulist to tell the AI that certain place the AI should never go. The AI will only move to the place that is safe.

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

There can be more improvement for the AI based on the human experience while playing the Wumpus world. The first improvement is that while the AI searching the unvisited safe square, it can visit the square that can help the AI to have more potential next move and more information instead of visit all unvisted safe path and then explore more. Another improvement is if the AI receive a Stretch, it can determine if it is necessary to shoot by determine whether the Wumpus location is found and interrupt the AI to explore more square to find the gold. The location of the Wumpus can be found earlier if the AI receive stretch at the boundary of the map instead of receive two stretch. These changes might improve the performance of the AI.