Final AI

In my algorithm for the Final AI, I utilize a set of unexplored tiles which the agent will travel to until the set is empty, in which case the agent heads back to the cave exit. The tiles inserted into this set are ones which are adjacent to the current position and are known to not be dangerous (when its adjacent tiles have dangerous percepts). Then, for the agent to travel to new tiles, I implemented a uniform cost search algorithm which would find the path with the least amount of moves and return a queue of the moves to get to the tile. A rundown of my algorithm looks like this: First, the unexplored set begins with the starting position, and if the tile has no danger Percepts to worry about, then it adds all adjacent tiles into the unexplored set. After this, the agent uses the uniform cost search to get the moves for traveling to the closest (by mathematical distance formula) tile, prioritizing those immediately in front of it. Then, it repeats with the adjacent tiles of the explored tile. This algorithm also takes into account possible Wumpus or Pits being in the way. It only travels upon tiles it has been to before, and when newly explored tiles have a BREEZE or STENCH, their adjacent tiles which are unexplored are put into a set for suspicious tiles of being dangerous. The tiles are removed and put back into unexplored only if proven to be safe by an adjacent tile having no STENCH or BREEZE. Finally, the agent remembers the boundaries of the cave when it BUMPs into the far walls from the starting tile, making sure unexplored tiles are within the dimensions of the cave. Some situational “smarts” in my program are if the agent has narrowed down the position of the Wumpus to one tile based on two or more STENCH tiles, then it will immediately turn towards the Wumpus tile and shoot it. Then it will add the dead Wumpus tile to its unexplored set, provided that there is no BREEZE near it. Also, if the entrance of the cave [0,0] has STENCH, then the agent will SHOOT the arrow to the right since killing the Wumpus has 50% chance.