

IDSN 599: Machine Intelligence

Homework 3: Wumpus World Agent

Due: 10/18/2021 @ 11:59PM

Goal

In this homework, you will create an agent to explore the Wumpus World.

Setup

- You will be adding your code in the place indicated – just above the call to main() – in the wumpusworldforagent.py code
- Be sure to add your comment block at the top of the file

```
'''  
Name  
IDSN 599, Fall 2021  
USC email  
Homework 3  
'''
```

Requirements

You are to define the data structures that you need for your agent to explore and move around in the Wumpus World.

You are then to write code in the chooseAction() method that defines the behavior of your agent.

It is given that sometimes the cave will create a situation that your agent cannot get to the gold.

Remember, you are not to change any code that I have provided to you other than defining your data structures above the chooseAction() method and your code in the chooseAction() method.

You can create your own functions. Just put them below the chooseAction() function.

You should do this in steps. Below are the steps I recommend. Do one step then test your code by running it. You may want to add print statements to see additional information about what your agent is doing.

Recommended Steps

1. Move your player forward until they reach an unsafe room. Then turn around, return to room 0,0 and climb out of the cave.
 - a. The return to room 0,0 algorithm should work for all the steps
2. Implement depth-first search (or your equivalent) so that you can move around the cave through all the safe rooms you can find. Do not move into an unsafe room. If you find the gold, grab it and return to room 0,0 and climb out of the cave.
3. You've explored all the safe rooms that you can, but you haven't found the gold. Implement an algorithm to choose an unsafe room and move into it. This room may be safe, or unsafe
 - a. If the room is safe, return to your safe-moving algorithm – step 2
 - b. If the room is unsafe, stay in your step 3 algorithm

A Note on Style

Be sure to comment your code. Also, you will lose points if your variable names are not meaningful. Make sure you use variable names that correspond to what you are storing in the variables.

Deliverables

A compressed folder containing `wumpuswordforagent.py`, named **hw03.zip**.

Grading (100 points total)

20 points: You have appropriate data structures for exploring the cave.

30 points: Your agent can move around randomly generated caves.

40 points: I will create multiple caves with a fixed layout of gold, pits, and Wumpus. These 40 points will be based on the percentage of these caves your agent was able to successfully negotiate.

10 points: One cave will be impossible to get to the gold. Your agent's performance in this cave will be evaluated.