

Build a rational agent to play (and win) Wumpus world using truth-table enumeration-based entailment (model checking) *to estimate probabilities*.

The program that simulates the Wumpus World will be given to you, as well as the code for an example agent that just makes random moves. You will need to download this code*. The example agent is in the file `wwagent.py` and the wumpus simulation is in the file `wwsim.py`. You should not change the `wwsim.py` file AT ALL. You should copy and edit the `wwagent.py` file to build your agent.

You need to build your rational agent so that it meets the following four performance criteria:

1. It only ever moves to wumpus world locations that exceed a threshold of 0.8 of being safe (no pit or wumpus in 80% of the models).
2. It always identifies whether a location is safe at the earliest time possible given percepts
3. If there is more than one safe location, it prioritizes safer locations and previously unvisited locations.
4. If the gold is reachable, the agent will eventually find it and win the game.

Furthermore, you need to implement your reasoning using an implementation of truth-table enumeration to determine at the earliest moment possible given the percepts whether a location is safe for the wumpus or not. You cannot use any other method to do this. The bulk of the grade will be given for this. You do not need to represent the rules of wumpus world declaratively – you can build them into a procedure that calculates the truth table for the Knowledge Base.

Extra credit will be given if you can demonstrate an effective implementation of probabilistic filtering for item 2.

You may use whatever method (from class or otherwise) you see fit to implement the other performance specifications, 3 and 4 in the list above.

You will submit the following:

1. Your version of `wwagent.py`, well written and documented, using the usual method.
2. A document that describes your implementation and shows, by way of evidence you collected from running the program, that your agent is rational according to the criteria 1 through 4.

*This code is modified from Greg Scott's public github <https://github.com/gregscott94/wumpus-world>, which itself has a lot of the AIMA (Norvig & Russell) code. Its unlikely any of this code will be of use to you, other than what I have given you here