Washington State University
School of Electrical Engineering and Computer Science
Fall 2019

CptS 440/540 Artificial Intelligence
Homework 5
Due: October 3, 2019 (11:59pm)

General Instructions: Your submission for this homework should be a zip file containing your Agent.h and Agent.cc files (or a PyAgent.py file), and an optional readme.txt file. Put your files into one zip file and submit as an attachment under Content → Homework 5 for the course CptS 440 Pullman (all sections of CptS 440 and 540 are merged under the CptS 440 Pullman section) on the Blackboard Learn system by the above deadline. Note that you may submit multiple times, but we will only grade the most recent entry submitted before the above deadline.

For this homework you will implement an agent to play the Wumpus World game that utilizes concepts from search and logic. Specifically,

1. Implement a strategy for moving the agent around the world. The strategy can be random or systematic, but should eventually visit all safe locations.
2. Implement a strategy to avoid the Wumpus by reasoning about the Wumpus's location based on Stench information. For example, knowing three Stench locations is sufficient to locate the Wumpus. In some cases one or two Stench locations, combined with some non-Stench locations, is sufficient. Implement this type of reasoning in your agent (hard-coded rules are fine).
3. Implement a strategy for remembering and reusing the agent's path to the gold. First, the path should be reversed so the agent can return to (1,1) and CLIMB. Second, since the agent will have multiple tries on each world, it should rerun this path on subsequent tries to win the game more easily. This path should be optimized to remove redundancy (e.g., remove loops that revisit the same location, eliminate bumps, etc.).
4. *For the test worlds, the gold will never be collocated with the Wumpus, and there will be no pits. The test worlds will vary in size*.
5. Submit a zip file with your Agent.h and Agent.cc files, or PyAgent.py file, along with an optional readme.txt file containing any information you think we may need about your agent. Your agent should not require any user input. Your agent will be tested by copying only your Agent.h and Agent.cc files, or PyAgent.py file, into a fresh copy of the simulator code, and compiling and running it on several test worlds. Your agent will be given 10 tries on each test world. Your grade will be based on satisfying the above requirements, *your agent's scores on the test worlds*, and good programming style (see the course website for links to style guides).