Assignment A1: Random Actions in Wumpus World

CS 4300
Fall 2017

Assigned: 22 August 2017

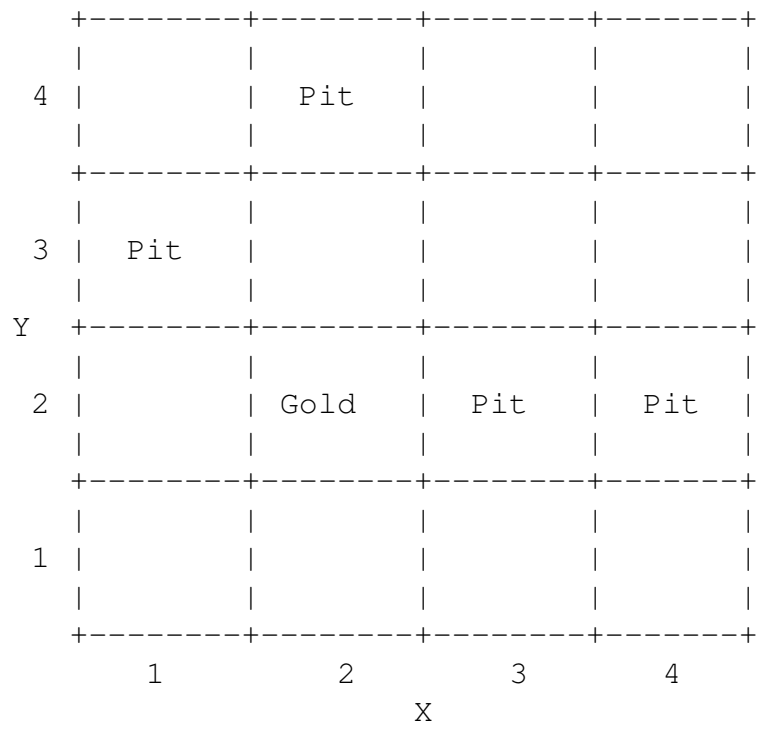
Due: 31 August 2017

For this problem, handin a lab report pdf (include name, date, assignment and class number in pdf) which studies statistics for a Wumpus World exploring agent. You should handin the report pdf as well as the source code used in the study. The code should conform to the style requested in the class materials. You will find the Wumpus World Matlab code in the class code link, in subdir A1; use CS4300_WW2 (with a fixed board layout). In addition, please turn in a hardcopy of the report in class before the start of class on August 31, 2017 Two-person teams need to have one person do report sections 1,3,5, and the other do 2,4, and 6, and each their own part of section 7; these sections need to be attributed to the person doing them. Write a lab report in the format (please do not deviate from this format!) described in the course materials. Discuss the statistical framework to establish a confidence interval on the means, and any hypothesis tests.

For the Wumpus board given below, determine the likelihood that the agent described below arrives at the square with the gold.

1. Develop an agent (named CS4300_agent1.m) function that randomly (uniformly) selects actions from FORWARD, RIGHT, LEFT in the Wumpus World. The starting location for each trial should by $x = 1, y = 1$ and facing right (toward square $[2, 1]$).
2. Run 2000 trials and determine the mean and variance of the number of steps the agent survives and the percentage of times the agent arrives at square $[2, 2]$. Determine the impact of varying the maximum number of steps allowed (i.e., *max_steps* in CS4300_WW2). Also give the 95% confidence intervals for these.

The board layout is:



Develop the agent function according to the following header:

```
function action = CS4300_agent1(percept)
% CS4300_agent1 - random agent example
%    It randomly either changes direction or moves forward
% On input:
%     percept (1x5 Boolean vector): percept values
%       (1): Stench
%       (2): Pit
%       (3): Glitters
%       (4): Bumped
%       (5): Screamed
% On output:
%     action (int): action selected by agent
%       FORWARD = 1;
%       ROTATE_RIGHT = 2;
%       ROTATE_LEFT = 3;
%       GRAB = 4;  -- NOT USED
%       SHOOT = 5;  -- NOT USED
%       CLIMB = 6;  -- NOT USED
```

```
% Call:
%     a = CS4300_agent1([0,1,0,0,0]);
% Author:
%     <Your name>
%     UU
%     Fall 2017
%
```