In the name of GOD

Artificial Intelligence (May 2020)
Homework#3: Wumpus world in Prolog

Due date: 15th June 2020

You will be considering the Wumpus world introduced in Russell and Norvig (**2009**) Chapter 7. For this programming assignment you'll use Prolog's ability to do inference in order to write an agent that will make safe moves within its world.

Software and Files:
You will need to download and install your own version of SWI-Prolog. It is freely available from http://www.swi-prolog.org/ for major operating systems. (version 8 or above 8 will have been recommended).

You have three file named **wumpus_world.pl**, **utils.pl**, and **my_agent.pl**. The first two files comprise a simulator for the Wumpus world. The third is an empty agent skeleton program. Your assignment is to flesh out the details in **my agent.pl**

Help for Running Code:
Start SWI-Prolog:

```
swipl
```

Load the world simulator:

```
?- [wumpus_world].
```

Load the agent:

```
?- [my_agent].
```

Run the agent:

```
?- evaluate_agent(1, Score, Time).
Correct to: "wumpus:evaluate_agent(1, Score, Time)"? y
```

If you read the output, you'll see the default agent just moves forward. It does this in the world shown in Russell and Norvig's Figure 7.2, which causes the agent's dead rather soon. (You use ^D to exit the programming environment.)
You will need to edit my agent.pl produce a more rational movement. To do this you will need to define an intelligent run agent(Percept,Action) like **Figure 2**.

The percepts are provided as a list of five elements [Stench, Breeze, Glitter, Bump, Scream], where you receive a "yes" or a "no" in the respective position. There is also an init agent function which you can use for initialization. The simulator knows the total state of the world like **Figure 1**, while your agent will know only what it senses through its perceptions. Initially the agent knows only the perceptions in position (1,1) and in order to acquire other information must be moved in other cells of the grid. Your agent must maintain its own state, containing all the information that gradually becomes available. The state will have to be update with the new perceptions every time an action is executed, and this information must be represented so as to permit reasoning (via interference) as to what operations are safe.

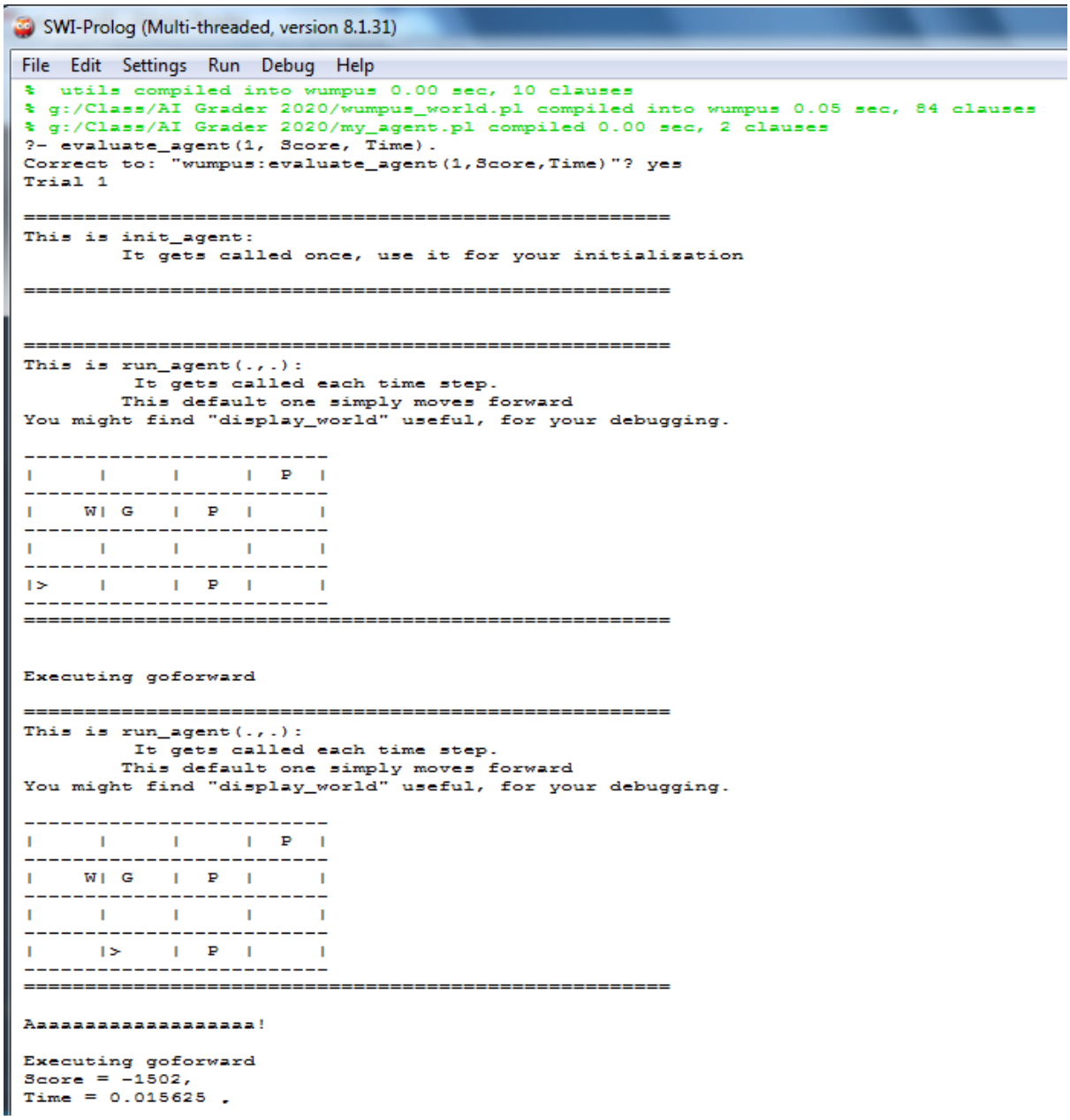

Figure1. wumpus world environment

```
%my_agent.pl

%   this procedure requires the external definition of two procedures:
%
%     init_agent: called after new world is initialized.  should perform
%                 any needed agent initialization.
%
%     run_agent(percept,action): given the current percept, this procedure
%                 should return an appropriate action, which is then
%                 executed.
%
% This is what should be fleshed out

init_agent:-
  format('\n=========================================================\n'),
  format('This is init_agent:\n\tIt gets called once, use it for your initialization\n\n'),
  format('=========================================================\n\n').

%run_agent(Percept,Action):-
run_agent(_, goforward ):-
  format('\n=========================================================\n'),
  format('This is run_agent(.,.):\n\t It gets called each time step.\n\tThis default one simply moves forward\n'),
  format('You might find "display_world" useful, for your debugging.\n'),
  display_world,
  format('=========================================================\n\n').
```

Figure2.my_agent file with initialization code

Important Notes:

- Pay extra attention to the due date. It will not extend.
- Be advised that submissions after the deadline would not grade.
- You should upload this homework like previous exercises on schoology
- Maybe this homework has an online presentation and attention that