

Project II: Wumpus World Game Report

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Introduction

The Wumpus world is a cave consisting of rooms connected by passageways. Lurking somewhere in the cave is the terrible Wumpus, a beast that eats anyone who enters its room. The Wumpus can be shot by an agent, but the agent has only one arrow and can only shoot him from an adjacent room. Some rooms contain bottomless pits that will trap anyone who wanders into these rooms (except for the Wumpus, which is too big to fall in). A 4x4 grid makes up the environment, the only mitigating feature of this environment is the possibility of finding gold while trying to avoid/shoot the Wumpus.

Predicate	Use
Dynamic	Introduces variables Breeze, Stench, WumpusLocation, pitLocation, goldLocation, and agentLocation. Limits the world to a 4x4 grid.
Safe([X,Y])	Checks if room with coordinates X and Y is safe or not.
Pit([X,Y])	Checks if room with coordinates X and Y contains a pit or not.
Wumpus([X,Y])	Checks if room with coordinates X and Y contains the Wumpus or not.
Breeze([X,Y])	Checks if there is a breeze in the room with coordinates X and Y.
isAdjacent([X,Y])	Checks if Room A is adjacent to Room B.
Stench([X,Y])	Checks if there is a stench in the room with coordinates X and Y.
GrabGold()	Checks if the gold was grabbed or not.
Gold([X,Y])	Checks if there is gold in the room with coordinates X and Y.
shootWumpus([X,Y])	Shoots the agent's arrow in the room with coordinates X and Y, and states if it had been killed or not.

First Scenario

Stench	Wumpus	Stench	Breeze
	Stench	Gold Breeze	Pit
	Breeze		Breeze
Agent (Start) Breeze	Pit	Breeze	

Snapshots of 1st Scenario

```

start, safe([1,1]).
true

start, pit([2,1]).
Breeze in [3,1]
Breeze in [1,1]
Breeze in [2,2]
Pit found.
true

start, wumpus([2,4]).
Stench in [3,4]
Stench in [1,4]
Stench in [2,3]
true

start, breeze([4,2]).
Breeze in [4,2]
true

start, wumpus([4,2]).
No Stench in [3,2]
No Stench in [4,3]
?- start, wumpus([4,2]).

```

```
start, gold([1,2]).
No Gold found
true
?- start, gold([1,2]).
```

Second Scenario

Stench	Wumpus	Stench Breeze	
	Stench Pit Breeze	Pit Breeze	Breeze Gold
	Stench Breeze	Breeze	Breeze
Agent (Start) Breeze	Pit	Breeze	Pit

Snapshots of 2nd Scenario

`start, gold([4,3]).`

Gold found
true

`start, breeze([2,3]).`

Breeze in [2,3]
true

`start, pit([2,2]).`

Breeze in [3,2]
No Breeze in [1,2]
Breeze in [2,3]
No Breeze in [2,1]
false

`start, safe([1,3]).`

true

`start, stench([4,3]).`

No stench in [4,3]
true

?- `start, stench([4,3]).`

Third Scenario

Stench			Breeze
Wumpus	Stench	Breeze	Pit
Pit Stench	Breeze		Breeze
Agent (Start) Breeze	Gold	Breeze	Pit

Snapshots of 3rd Scenario

`start, gold([2,1]).`

Gold found
true 1

`start, pit([4,1]).`

Breeze in [3,1]
Breeze in [4,2]
Pit found.
true 1

`start, pit([2,1]).`

Breeze in [3,1]
Breeze in [1,1]
Breeze in [2,2]
false

`start, wumpus([1,3]).`

Stench in [2,3]
Stench in [1,4]
Stench in [1,2]
true 1

?-
`start, wumpus([1,3]).`

```
start, gold([2,1]).
Gold found
true

start, pit([4,1]).
Breeze in [3,1]
Breeze in [4,2]
Pit found.
true

start, pit([2,1]).
Breeze in [3,1]
Breeze in [1,1]
Breeze in [2,2]
false

start, wumpus([1,3]).
Stench in [2,3]
Stench in [1,4]
Stench in [1,2]
true

?- start, wumpus([1,3]).
```

🚧 Limitations & Eventual Future Remedies

We tried three experiments, out of which we only won two times. For instance, the scenario in which we failed; we made the wrong decision which led us to losing the game. In order to remediate to this issue in the future, I personally believe our game agent has to be an intelligent one, and not one that relies on the humans to do so because if the code would be error-prone if we relied on a human, and not an intelligent agent, to play the game and make its own moves.