Assignment 04 (Due: Friday, December 5, 2014)

CSCE 322

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1 Instructions

This assignment will use Prolog to extract certain information about the state of a Chutes & Ladders game.

1.1 Data File Specification

The positions of players, chutes, and ladders will each be represented as lists of numbers. The board will be represented as a list of lists of numbers.

1.2 `percentChutesLadders(Chutes,Ladders,Board)`

The query `percentChutesLadders(Chutes,Ladders,Board)` will be successful when no more than 5% of the board spaces contain chutes or ladders.

1.3 `pathOfPlayer(Position,Chutes,Ladders,Board,Rolls)`

The query `pathOfPlayer(Position,Chutes,Ladders,Board,Rolls)` will be successful when `Rolls` is unified with the shortest valid path (fewest number of rolls) from the position of the player to the end of the board. There may be multiple shortest paths, and `pathOfPlayer(Position,Chutes,Ladders,Board,Rolls)` should report them all, if `;` appears in the query.

1.4 `clearPath(Position,Chutes,Ladders,Board,Rolls)`

The query `clearPath(Position,Chutes,Ladders,Board,Rolls)` will be successful when `Rolls` is unified with a valid path from the position of the player to the end of the board that does not encounter any chutes or ladders.

1.5 `validGame(Positions,Chutes,Ladders,Board)` (10 **Points Extra Credit**)

The query `validGame(Positions,Chutes,Ladders,Board)` will be successful when the state of the game satisfies these properties:

1. At most, 5% of the `Board` contains chutes or ladders
2. Player 1 does not have a shorter path to the end of the `Board` than the others players

1.6 README.txt

This file should contain any assumptions that you made and sources that you used during the completion of this assignment.

2 Compilation & Execution

Your program will be tested on `cse.unl.edu`, using `pl`. `csce322as04testcases.pl` will include test cases for testing your program. You can run the test cases with the commands:

```
[csce322as04testcases]
part01test01
```

from within `pl`. The number following `part` can be replaced with 02 . . . 04 and the number following `part` can be replaced with 02 or 10 to try different test cases. Entering a `;` will allow you to see every possible binding of results

3 Webgrader Warning

Prolog programs can take some time to run. If you need more than 30 seconds for a test to run, mention that in your README file.

4 Naming Conventions

You will be submitting at least 3 `.pl` files and 1 `README.txt` file. The filenames should be `csce322as04pt01.pl`, `csce322as04pt02.pl`, and `csce322as04pt03.pl`

Component	Points
`csce322as04pt01.pl`	20
`csce322as04pt02.pl`	35
`csce322as04pt03.pl`	35
`README.txt`	10
Total	100

5 Point Allocation

6 External Resources

Prolog - Wikibooks
Learn Prolog Now!
Prolog Tutorial Category:Prolog - Rosetta Code