Clue in Prolog
– A Didactic Example –

Luciano Santos

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1 Introduction

This is the documentation for a simple script in SWI-Prolog that plays the game Clue[1]. This implementation follows a didactic approach, not aimed at creating an advanced AI system that employs complex strategies and human behaviour models to master the game. It simply illustrates how a declarative language can be used to play a relatively simple game based on a certain set of rules.

The implementation is based on the rules for the 2002 version of the game (see PDF on the root folder) and the board on Figure 1.

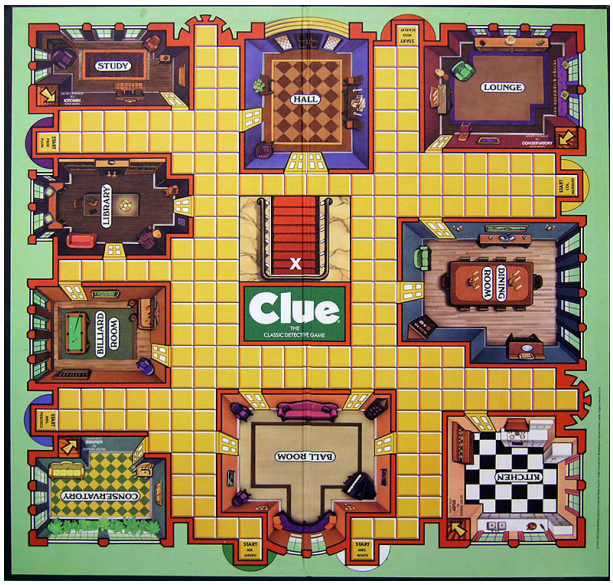

Figure 1: The game board.

The following principles were observed in this implementation to make it simple:

- no long-term planning – for each action and information received, the agent updates its 'knowledge base' and, on each turn, it makes an independent decision based on the current knowledge, instead of following a planned route;
- no lucky guesses – the agent only makes an accusation if it's certain that it's true;
- no poker face – the agent only acts to acquire more information, and will not make a move or guess for the sole purpose of misleading other players;

[1] `http://www.hasbro.com/en-us/toys-games/hasbro-games:clue` (accessed on August, 2016)

- no mind reading – the agent will not infer information from other players actions, except facts that can be logically proven; it will not try to predict how people would or should behave, however, it will assume that everyone will play strategically, *e.g.*, if the player to the left has already shown a certain card before, that card will not be used on a next guess, because a smart player would keep showing the same card over and over again, even if she had a different one to show.

The sections below describe the rationale and the details of this implementation. Section 2 explains how the game board and the current position of each player is stored internally and how the agent finds the shortest path to a given goal. Section 3 describes how the knowledge acquired as the match progresses is represented, and how the game decides which action to take on each turn. Finally, Section 4 brings the predicates that allow the final user to start a new game and interact with the agent.

2 The Board

3 The Data

4 The Interface