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Homework Assignment 1: Knowledge Based Agents with CP0 Logic

Grau en Enginyeria Informàtica

# Introduction

This work had the goal to develop an intelligent agent that, having a grid of n x n cells with some envelopes hided, the agent had to find it out using a sensor to discover the position of the envelopes in the world. The agent located in a position (x, y) can receive these different readings from his sensor:

1. If there are some envelopes at positions {(x + 1, y – 1), (x + 1, y), (x + 1, y + 1)}, it will receive the reading: 1.
2. If there are some envelopes at positions {(x + 1, y + 1), (x, y + 1), (x - 1, y + 1)}, it will receive the reading: 2.
3. If there are some envelopes at positions {(x - 1, y – 1), (x - 1, y), (x - 1, y + 1)}, it will receive the reading: 3.
4. If there are some envelopes at positions {(x + 1, y – 1), (x, y - 1), (x - 1, y - 1)}, it will receive the reading: 4.
5. If there is an envelope at position (x, y), it will receive the reading: 5.

# **Our agent knowlegde**

# Propositional logical formulas

To build our Γ we started defining our variables:

* : We will use this variable to know the detector’s response in a certain position and for modelling the new readings we obtain at the current time.
* : We will use this variable to indicate that in the position (x, y) there can be an envelope and for modelling the new state resulting after we use the information from the new readings.
* : We will use this variable to save the informations about the envelopes into our agent’s memory and for modelling the previous state, just before we get a new sensor reading.

Our set of clauses:

For all position that can only have one sensor reading we create a clause that means that if there’s no sensor reading, there can’t be an envelope.

For all corners, that can be detected by two different sensors, we create a clause that means that if both sensors don’t give a reading, there can’t be an envelope since we know that there isn’t an envelope if only one server gives the reading.

//TODO convert to CNF