Introductio to Artificial Intelligence: Assignment 2

Introduction

Welcome to the second - and last - assignment for our Introduction to Artificial Intelligence course. In this assignment, you'll be addressing three different topics:

1. **SEARCH AND HEURISTICS**: In this part of the assignment, you will be implementing the A* search algorithm, an essential tool in AI for pathfinding. You will have to implement the algorithm in the context of a maze solver.
2. **LOGIC**: In this section, you'll explore logical constructs and their applications, making a propositional logic implementation of the *Knights and Knaves* puzzle. You will have to implement the knowledge base and check the model to find out which statements are true and which aren't.
3. **BAYESIAN NETWORKS**: Implement probabilistic inference with Bayesian Networks. Using the `pgmpy` library, you'll design a network and calculate the likelihood of specific events.

Instructions

You will be provided with a jupyterlab notebook to fill in. This notebook contains all instructions you need to carry out the exercises, and a few extra questions to help you reflect on the assignment. Feel free to look back at all exercises and examples explored in class during the course. Figure 1, 2 show you the correct output for the first two parts, respectively. The solution for Part 3 is probability = 0.0006825. Once you are done with the assignment, upload it in Moodle. The deadline is the 15th of October (midnight). Good luck and enjoy!

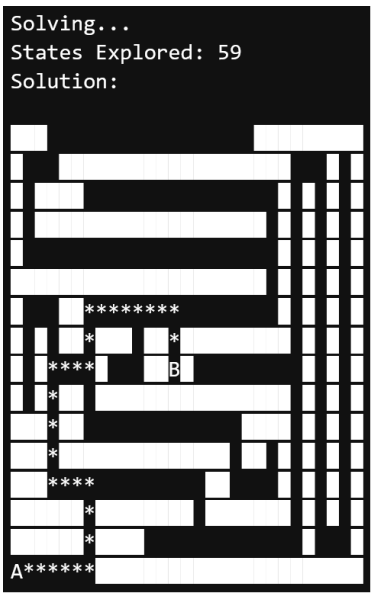

Figure 1: Correct solution for the maze solver (part 1).

```
Puzzle 0
    A is a Knave
Puzzle 1
    A is a Knave
    B is a Knight
Puzzle 2
    A is a Knave
    B is a Knight
Puzzle 3
    A is a Knight
    B is a Knave
    C is a Knight
```

Figure 2: Correct output for the 4 knights and knaves puzzles (part 2).