Name: Vagif
Surname: Khalilov
Group: BS20-04

Introduction to Artificial Intelligence

Assignment 1: Book Finding

Algotihms:

- Backtracking

  Inside this algorithm, the usual dfs is used. However, in addition to Harry, he can decide which cell to step on, not only depending on whether he was on the cell or not but also depending on whether the inspector is located on it. Roughly speaking, Harry has his own memory, which shows whether he was in a cage (that is, he knows that it is safe), whether he was near her (that is, he probably knows that there may be inspectors near this cage), or it is the contents of this cell that he does not know at all. How Harry's memory works depends on the perception scenario. Since it is impossible to iterate over all possible options, this algorithm cannot find the most optimal path.

- A*

  This algorithm differs significantly from backtracking. With the help of the A* algorithm, you can find the optimal path, this is also confirmed by testing. Inside the algorithm, a wave approach is applied, which is also used in BFS, Dijkstra's algorithm and the like. For each unvisited cell, we calculate the total weight (W) needed to reach that cell based on the final cell (G) and a heuristic function (H). Since going to almost every cell is the same as another, the value of the heuristic is almost always 1. As with going back, Harry also has a memory that builds depending on the scenario.

$$W=G+H$$