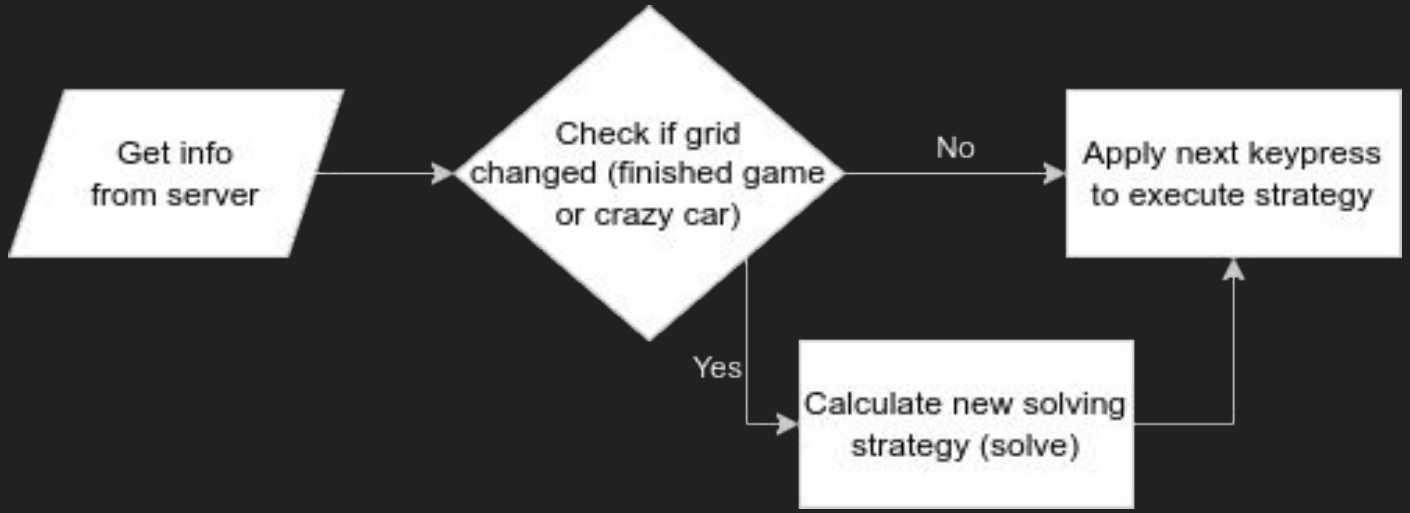
RUSH HOUR

Artificial Intelligence
University of Aveiro

Pedro Ferreira, nº 98620
Júlia Abrantes, nº 104170
Samuel Teixeira, nº103325

Flowchart (*student.py*)



Flowchart (*solve* function)

Heuristics Used

- H1: Piece Moved is different from the previous one
- H2: Distance from player car to exit
- H3: Number of blocking pieces

Benchmarks

- Due to **A*** and **graph search** algorithm, a solution can be found quickly and with less steps;
- To implement the A* algorithm, we used a **priority queue** for the open nodes (for speed purposes);
- Using the 1st heuristic, we were able to reduce the number of times the cursor selects and unselects pieces (since it favors strategies with sequential moves using the same piece);
- Comparing to the 1st working iteration (using Breadth-first search), this algorithm is about **100x faster.**

Level	Avg Moves	Avg Open Nodes	Agv Time
1	5	0	0
2	6	1	0
3	9	18	0
4	7	28	0
5	11	58	0.01
6	10	22	0
7	13	764	0.26
8	14	3926	1.58
9	15	12296	5.93
10	13	2672	0.83
11	16	20393	11.84
12	21	347	0.12
13	21	846	0.29
14	24	297	0.09
15	24	1654	0.46

Complete benchmarks can be found at ***results/benchmarks.csv***