

Assignment 2

Introduction to Artificial Intelligence

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September 26, 2022

1 Implementation details

For this assignment, we implemented a `solve()` function inside `main.py` that can be run with the task ID for every task from 1 to 5.

The implementation defines a class `Node` that encapsulates the information of every tile on the map, containing its position, heuristic functions `g`, `h` and `f` and its parent and child nodes.

The agenda loop and open and closed list nodes were built following the provided pseudo-code. For task 5, we also added a piece of code for handling the moving goal that recomputes the distance heuristic on every open node.

We also added some statistics for every task such as explored node count, time elapsed and maximum length of open node list.

2 Results

We ran the code for every task and got the following results:

Task 1

- Time elapsed: 0.042 seconds
- Nodes explored: 147
- Max length of open node list: 15
- Path length: 37

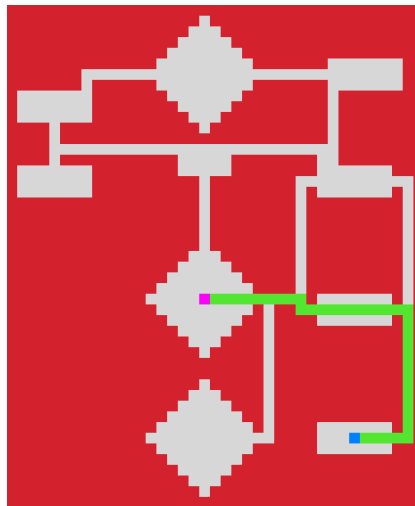


Figure 1: Task 1 path.

Task 2

- Time elapsed: 0.077 seconds
- Nodes explored: 236
- Max length of open node list: 27
- Path length: 71

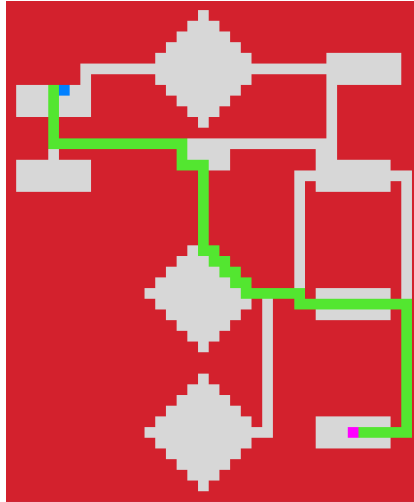


Figure 2: Task 2 path.

Task 3

- Time elapsed: 0.112 seconds
- Nodes explored: 188
- Max length of open node list: 18
- Path length: 36

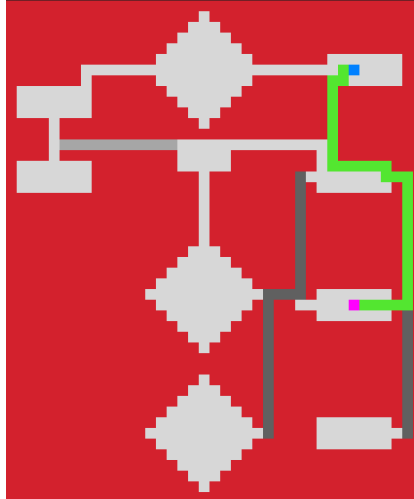


Figure 3: Task 3 path.

Task 4

- Time elapsed: 0.093 seconds
- Nodes explored: 191
- Max length of open node list: 19
- Path length: 50

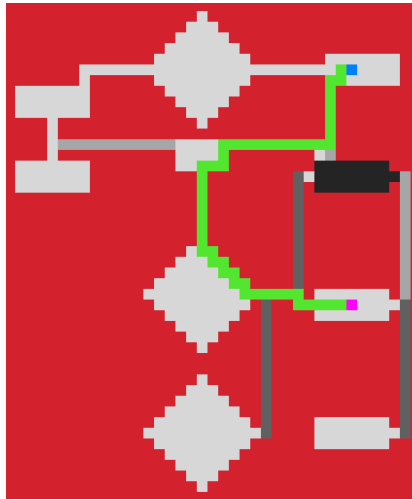


Figure 4: Task 4 path.

Task 5

- Time elapsed: 0.055 seconds
- Nodes explored: 112
- Max length of open node list: 22
- Path length: 26

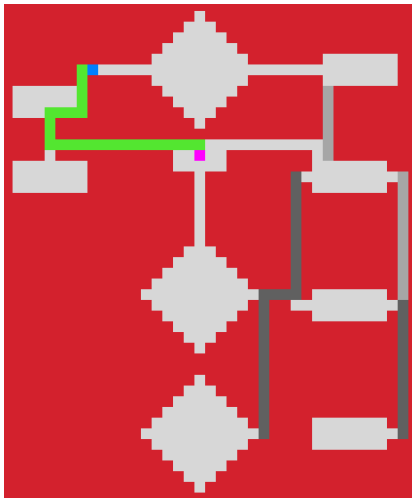


Figure 5: Task 5 path.