Test 2 – algorithms

Total time: 1h

Keep the code clean and properly formatted.

Make a program with a function for the following problem.

You need to use command line arguments (first argument is the input file name and the second argument is the output file name

Grade starts from 2p.

Find the shortest way to a bus stop 8p

You are given a two-dimensional integer matrix containing 0s, 1s, 2s and 3s where

- 0 represents an empty cell
- 1 represents a wall
- 2 represents a house
- 3 represents a bus stop

Your program should output a number S representing the shortest path from the house to any bus stop.

You can move up, down, left and right but you can't move through a house or a wall cell. If there is no path then output the value -1.

You should use a **graph traversal** technique to find the solution.

Input.dat

0 1 3 0

1 1 1 1

0 3 0 0

0 0 0 2

Output.dat

3

Explanation:

We can go from the house at matrix[3][3] to the bus stop at matrix[2][1] with 3 moves (left-> left->up is one possible solution)

If we remove the bus stop at matrix[2][1] then we can't reach any bus stop because of the walls

Simplified version -2p (max grade 8)

Instead of the length of the shortest path, just output a 1 if a path exists (regardless of it's length) and -1 if there is no path

Extra +2p

Solve any version of the previous problem but without a graph traversal.

Good luck 😊