

Search Assignment

Search Problem: Due – October 14

In this assignment, you are to implement, at least, three search algorithms for Gridworld (see below).

Requirements

- You are to write a single program. The goal of the program is for you to “locate” the gold and avoid falling into a hole. If you fall into a hole, then you die. You must implement **two** of the following search methods, one from each group

Group 1

1. Breadth-first search or
2. Depth-first search

Group 2

3. Uniform-cost – cost of 1 for each square
4. Best-first search

- When starting, the program should query the user as to which search algorithm to use and the grid location to start (example – 0,0 or 2,1, or any format that will accommodate your program). You need to locate “only one – not all” of the gold elements.
- The codes are as follows:
 - a. G indicates Gold (or Goal)
 - b. Holes are pits and you cannot move.
- *Hint – You definitely want to look for repeated states to make sure you don't get caught in a loop.*

Here is the Gridworld map that you must use.

- The origin $\langle 0, 0 \rangle$ is in the lower left corner. This would result, in the initial location for a hole as $\langle 2, 1 \rangle$.
- Your program should return the
 1. Solution path, the total number of nodes expanded.
- Your program must be documented. Your name must appear in the file, and you must use comments to describe what your programs are doing.

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You should submit the code for this program, test runs, a readme file that describes how to run and load your programs, documentation for each search program, and **a brief discussion about the 'efficiency' of the searches that you chose. Obviously, depending on where you start, you may or may not get the same numbers?**

The grade for this portion of the project will be based on the following:

- Accuracy of your code
- Thoroughness
- Efficiency of code
- Style
- Documentation

Students should use the project program on the CSP machines to turn in their programs. The name for this part of the project is: *gridworld*