

Programming Assignment 1

(100 points)

Assigned Date: Thursday, September 22, 2011

Due Date: 11:59 PM Thursday, October 6, 2011

Educational Goal

Become familiar with uninformed search strategies.

Requirements

Implement the Vacuum World example (Lecture “Solving Problem by Searching”, slides 13 and 14). Goal State is either State 7 or State 8. A vacuum could be in any state, initially. Write a program that takes any number between 1 and 8 as an initial state, output the states it visits, calculate total path cost (each step costs 1), and report the solution path from the initial state to the goal state.

- Uninformed Search: Implement breadth-first search, depth-first search, and interactive deepening, respectively. The program should be able to avoid repeated state in order to find the goal state.
- Based on your experimental results, write a report with minimum 500 words to discuss the strength and weakness of the 3 search strategies.

Submission Requirements

1. You will be asked to demonstrate the program at the Unix lab.
2. Your program should be well-documented. Variable names and function names should be self-descriptive. Major functions should be explained clearly in comments. The program outputs should be presented in a clear sequence.
3. Test your program thoroughly using 9 inputs one by one. The 9 inputs are number 1, 2, 3, 4, 5, 6, 7, 8, and 100. Here 100 is an invalid input and the program should inform that it is an incorrect input. Submit the outputs of the 9 test cases.
4. Turn in the paper copy and soft copy of all the files of this assignment. Submit a single zipped file of all the files of this assignment through your UMassOnline account at <http://boston.umassonline.net/index.cfm>. Submit the paper copy along with the cover page in class. Paper copy should be bound firmly together as one pack (for example, staple, but not limited to, at the left corner). 5 points will be deducted for unbounded homework.
5. Name your file with AI_ lastname_ firstname_ pr1. For example, student John Smith should name his file as AI_Smith_John_pr1.zip.
6. No hard copies or soft copies results in 0 points.