

Homework Assignment 2

(200 points)

Assigned Date: Wednesday, October 7, 2009

Due Date: 4:00 PM Thursday, October 21, 2009

Educational Goal

Become familiar with uninformed and informed 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, and report the solution path from the initial state to the goal state.

- (40%) Uninformed Search: Implement breadth-first search and depth-first search, respectively. The program should be able to avoid repeated state in order to find the goal state.
- (40%) Informed Search: Implement A* search.
- (20%) 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. Follow the language requirements for programming assignments posted at http://www.cs.umb.edu/~ding/classes/470_670/student.htm
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_ hw2. For example, student John Smith should name his file as AI_Smith_John_hw2.zip.
6. No hard copies or soft copies results in 0 points.