

Artificial Intelligence Methods (G5BAIM)

(Coursework – 2000)

Introduction

The coursework should be handed into the Documentation Secretary (Gemma Barker) by 3:00pm on Thursday 27th April 2000.

Administration

- You should include a title page for this assignment. On it should be
 - Your name and username (*this should be top left*)
 - The course code and course name (i.e. G5BAIM – Artificial Intelligence Methods (AIM))
 - The lecturers name (i.e. Graham Kendall)
 - The title of the assignment (“Implementation of Search Techniques”)
- **Every** page should, at least, have a page number and your username on it
- When you hand in your assignment, please do not put it inside a plastic wallet. Stapled, top left, is probably the best idea (rather than a paper clip)
- Your assignment **must** be typed and should be no longer than three A4 sides. The font size used must be 10 or greater.
This limit does not include the title page, nor the program listing, which you are required to hand in, as an appendix.

Some of the above may sound a bit pedantic but when I have 100 pieces of coursework to mark, small things such as those listed above really does help ☺

Assignment

In the lectures we have looked at various search techniques. This assignment asks you to implement, and comment on, those techniques.

Take a look at the following 8-Puzzle problem

3	4	2
	5	6
7	8	1

Initial State

1	2	3
8		4
7	6	5

Goal State

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1. Using a programming language of your choice, implement a breadth first search that finds the goal state shown above, starting at the initial state shown. Answer the following questions
 - 1.1. How many nodes were expanded in finding the goal state?
 - 1.2. How many tiles were moved? State the order in which the tiles were moved to get from the initial state to the goal state?
2. Repeat 1, for depth first search and iterative deepening search
3. Repeat 1, for one of the other search algorithms (of your choice) that has been presented in the lectures
4. Experiment with different initial states, goal states and, perhaps, different problems (maybe a 15-Puzzle problem)

When implementing your program, if your choice of programming allows it, you should design and implement the program so that it follows the structure shown in AIMA (Russell/Norvig).

Marking Scheme

You should structure your answers using the following guidelines. The percentage figures show how each of the sections are weighted.

Report Structure	%
1) Justify your choice of programming language	5
2) Comment on your design and how you have implemented the various search techniques	15
3) How many nodes were expanded for breadth first search and how many tiles were moved, and in what order	5
4) As for 3 but for depth first search	5
5) As for 3 but for iterative deepening search	5
6) As for 3 but for your own choice of algorithm	5
7) Comment on the results from 3 to 6, above	10
8) Comment on your own experiments	40

The final 10% will be allocated as I see fit.

As I stated in the introductory lectures I will try to provide feedback on this assignment. This, as I said, is likely to be in the form of a “tick” sheet as it would simply take too much time to provide half an A4 sheet (say) of typed comment for 100 students. Please let me know what you think of the feedback you receive in the end of course comments form. If you do not find it useful, then I can change it for next year.

No doubt you’ll let me know if you have any questions.