

Lab Sheet for AI Techniques, Part 3/7**Task 1**

Which of the following statements are true and which are false? Explain your answers.

- (a) Depth-first search always expands at least as many nodes as A* search with an admissible heuristic.
- (b) $h(n) = 0$ is an admissible heuristic for the 8-puzzle.
- (c) A* is of no use in robotics because percepts, states, and actions are continuous.
- (d) Breadth-first search is complete even if zero step costs are allowed.

Task 2

Use A* search to work out a route from Zerind to Bucharest. Provide the search tree for your solution showing the order in which the nodes were expanded, and the cost $f(n)$ at each node. Use the Romania map on slide 51 from week 11/12.

Task 3 (optional)

Study the implementation of A*-search for a maze using Python at

<http://www.laurentluce.com/posts/solving-mazes-using-python-simple-recursivity-and-a-search/>. Copy the code into your Python environment and observe its performance for different mazes. (This is another opportunity to improve your Python coding skills before using them for more complicated tasks later on in this module.)