EECS 348 Introduction to Artificial Intelligence

Practice Midterm Exam

May 11, 2010

Partial credit will be given, so feel free to explain your work.

1. (10 points total) You have a list of the top 10 restaurants in the country, and want to eat at all of them. You don't want to visit two steakhouses in a row, but otherwise simply want to minimize your total travel time.

   (a) (6 points) Express your situation as a search problem. That is, define the states, operators, and goal test you will use.

   (b) (1 point) What search algorithm would you use for this problem?

   (c) (3 points) Assume you're using A* search. Devise a heuristic that is admissible, and another that is inadmissible. With which will you obtain optimal solutions?

2. (10 points total) Consider the Tic-Tac-Toe board in Figure 1.

X	O	X
O	O	
	X	

Figure 1: Minimax Example

(a) (6 points) X is to move. Draw the full minimax tree for this problem.

(b) (2 points) According to the minimax algorithm, which move should the maximizing player make?

(c) (2 point) Describe behavior for the O player in which the Minimax move given above is not optimal.

3. (4 points total) Describe four problems, where each one is best solved by a different technique from the following list: Constraint Satisfaction with Arc Consistency, Uninformed Search, A* Search, and Minimax. Each problem should be described in two-three sentences each, and invent these (don't use standard examples from class).

4. (6 points) Say you had a meeting to convince Loebner to make one *incremental* change to the Loebner prize that would improve the contest. In about five sentences, what would your change be, and why?