CS161: Fundamentals of Artificial Intelligence

Winter 2022 - Midterm Study Guide

February 12, 2022

1 Material

The following items are in the scope of the midterm:

1. What are common definitions of AI? What is the Turing test?

2. Basic LISP programming, lists, recursion

3. Systematic search strategies:

   - Edition 3 & 4: Sections 3.0-3.4

4. Informed search strategies:

   - Edition 3: Section 3.5, excluding consistency, RBFS, MA* and SMA*
   - Edition 4: Section 3.5.0-3.5.3, excluding consistency; Section 3.5.5, excluding RBFS, MA* and SMA*

5. Heuristics:

   - Edition 3: Section 3.6
   - Edition 4: Section 3.6.0-3.6.3, excluding effective depth

6. Local search strategies:

   - Edition 3 & 4: Section 4.1

7. Game playing:

   - Edition 3: Sections 5.0-5.4.2, 5.4.4, and 5.5, excluding alpha-beta pruning
   - Edition 4: Sections 5.0-5.3.2, 5.3.4, and 5.5, excluding alpha-beta pruning

8. Constraint satisfaction:

   - Edition 3 & 4: Sections 6.0-6.2.2, 6.3.0-6.3.2

2 Topics

The following items will almost certainly be on the midterm and determine a large part of your score.

1. Simple LISP programming questions.

2. Label nodes in a search tree according to the order in which they will be expanded/generated for any of the search algorithms.

3. Determine branching factors and solution depths of search problems.

4. Determine admissibility and consistency of heuristics.

5. Determine completeness, optimality, time, and space complexity for any of the algorithms.

6. Perform steps of constraint satisfaction backtracking search, for various choices of variable order, valueselection, and constraint propagation.

7. Compute minimax or expectiminimax values to solve a game.