

Assignment 2

CS438: Artificial Intelligence

Spring 2025

Due date: March 18, 2025

Submissions: Submit your written answers as a PDF on Blackboard by the posted deadline.

Problem 1 (Ch. 5) [3pts – 1 pt each (0.5 answer, 0.5 explanation)]

Which of the following are true and which are false? Give brief explanations.

- a. In a fully observable, turn-taking, zero-sum game between two perfectly rational players, it does not help the first player to know what strategy the second player is using—that is, what move the second player will make, given the first player's move.
- b. In a partially observable, turn-taking, zero-sum game between two perfectly rational players, it does not help the first player to know what move the second player will make, given the first player's move.
- c. A perfectly rational backgammon agent never loses.

Problem 2 (Ch. 6) [2pts]

The tree structured CSP solution (Figure 6.10 in Section 6.5) makes arcs consistent starting at the leaves and working backwards towards the root. Why does it do that? What would happen if it went in the opposite direction?

Problem 3 (Ch. 6) [2pts]

Define in your own words the terms constraint, backtracking search, arc consistency, and cycle cutset.

Problem 4 (Ch. 6) [3pts]

Explain why it is a good heuristic to choose the variable that is most constrained but the value that is least constraining in a CSP search.