CS557E: Artificial Intelligence

Washington University of Virginia

Assignment 1

1. **Exercise 1** (25 Points)
   Define in your own words:
   - Intelligence
   - Artificial Intelligence
   - Agent
   - Rationality
   - logical reasoning.

2. **Exercise 2** (25 Points)
   What's the difference between a world state, a state description, and a search node? Why is this distinction useful?

3. **Exercise 3** (25 Points)
   Give the name of the algorithm that results from each of the following special cases:
   - Local beam search with k = 1.
   - Local beam search with one initial state and no limit on the number of states retained.
   - Simulated annealing with T = 0 at all times (and omitting the termination test).
   - Simulated annealing with T = ∞ at all times.
   - Genetic algorithm with population size N = 1.

4. **Exercise 4** (25 Points)
   Which of the following are true and which are false? Give brief explanations.
   - 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.
   - 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.
   - A perfectly rational backgammon agent never loses.