CS 188
Spring 2023

# Regular Discussion 3

## 1 Local Search

1. Give the name of the algorithm that results from each of the following special cases:

   (a) Local beam search with $k = 1$.

   (b) Local beam search with one initial state and no limit on the number of states retained.

   (c) Simulated annealing with $T = 0$ at all times (and omitting the termination test).

   (d) Simulated annealing with $T = \infty$ at all times.

   (e) Genetic algorithm with population size $N = 1$.

2. When might local search (i.e. hill climbing) be better than using A* search? When might it be worse? There are many possible answers.

# Q2. Propositional Logic

**(a)** Provide justification for whether each of the following are correct or incorrect.

**(i)** $(X \vee Y) \models Y$

**(ii)** $\neg X \vee (Y \wedge Z) \models (X \implies Y)$

**(iii)** $(X \vee Y) \wedge (Z \vee \neg Y) \models (X \vee Z)$

**(b)** Consider the following sentence:

$$[(Food \implies Party) \vee (Drinks \implies Party)] \implies [(Food \wedge Drinks) \implies Party] \ .$$

**(i)** Determine, using enumeration, whether this sentence is valid, satisfiable (but not valid), or unsatisfiable.

**(ii)** Convert the left-hand and right-hand sides of the main implication into CNF.

**(iii)** What do you observe about the LHS and RHS after converting to CNF? Explain how your results prove the answer to part b.i.