

**CSC242: Homework 1.6**  
**AIMA Chapter 4.1.3–4.1.4**

1. What are the advantages and disadvantages of keeping track of more than one state during local search?
2. Compare parallel local search with local beam search.
3. 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  $N = 1$ .
4. Suppose you're working on a problem at your job. Your officemate suggests an approach based on hill climbing. The boss asks for your opinion on the spot. You have about 10 seconds. What would you say?
5. Give a hill climbing algorithm for solving Travelling Salesman problems: "Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city?" (Wikipedia)
6. Apply local beam search with  $k = 2$  and  $k = 3$  to the "polygon world" pathfinding problem from the previous homework (like AIMA 3.31). Make up different configurations to test local beam search against basic hill climbing.