COMP 312
Assignment 5
Due at 9:00 a.m., Thursday, March 31, 2005
All problems are of equal value.

Reading
Brassard & Bratley, Chapter 6, with emphasis on sections 6.1, 6.2, 6.3, and 6.6.

Practice
Brassard & Bratley, 6.2, 6.4, 6.5, 6.9, 6.10, 6.11, 6.12, 6.19, 6.20.

To Be Handed In
5. You are planning a drive from Middletown to Las Vegas (in search of your fortune). You car gas tank when full will take you 500 miles. You have available a map which shows the exact distance between gas stations along your planned route. Describe a greedy algorithm for deciding which stations to stop at in order to minimize the number of stops you have to make. Show your algorithm is correct. What is the running time of your algorithm?

Bonus
You are on the ground floor of a 4 storey building (i.e., ground floor, first floor, second floor, third floor). There are four light switches, one for each floor, in front of you. Your job is to figure out which switch belongs to which floor. You can turn switches on and off as many times as you wish but you are only allowed to go upstairs and check the result of your experimenting once. You are not allowed to go outside and look if lights went on. You must stay inside on the ground floor and go up and down the stairs, possibly visiting all floors, exactly once. (Note: it is easy to figure out which switch is for the ground floor so the real problem is to assign the other three to floors.)