

**Homework 7** Due Thursday Oct. 22, 2009 in class

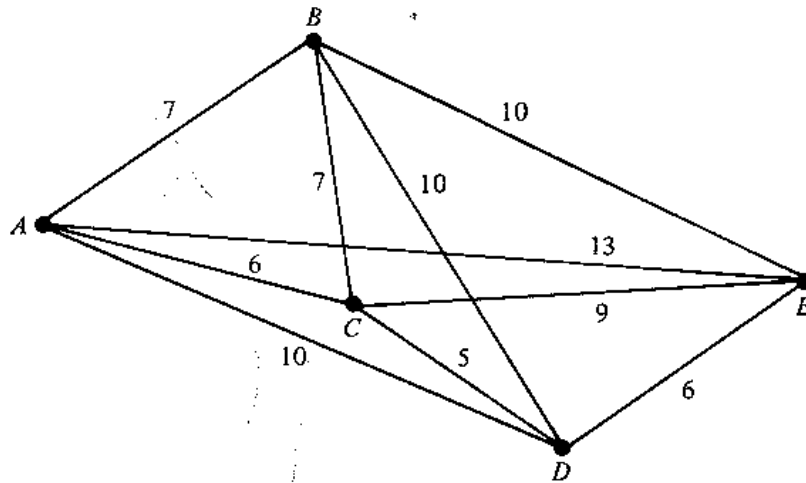
I. **LISP Problem. Use the Computer Assignment Guidelines**

{This problem is hard. Do not wait until the last minute to start working on it}

Implement the traveling salesman problem(s) below:

A traveling salesman has  $n$  number of cities to visit. He wants to know the shortest route which will allow him to visit all cities one time and return to his starting point. Test your program with the following three cases: (a) The problem in section 1.1.6.1 of the 1980 Nilsson text (see below), (b) the cities {Jacksonville, Tallahassee, Gainesville, Tampa, and Orlando} starting in Gainesville, and (c) any 8 cities of your choice. Hint: You may want to use a Branch-And-Bound or similar method rather than brute force. All distances are available on the web or use your own estimates.

**1.1.6.1. A Traveling Salesman Problem.** A salesman must visit each of the 5 cities shown in the map of Figure 1.5. There is a road between every pair of cities, and the distance is given next to the road. Starting at city  $A$ , the problem is to find a route of minimal distance that visits each of the cities only once and returns to  $A$ .



*Fig. 1.5 A map for the traveling salesman problem.*