



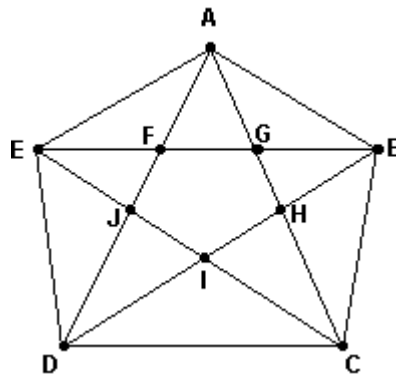
NATIONAL PARALEGAL COLLEGE

717 EAST MARYLAND AVENUE, PHOENIX, AZ 85014-1262 TEL:
800-371-6105 FAX: 866-347-1561 E-MAIL:
INFO@NATIONALPARALEGAL.EDU WEB:
[HTTP://NATIONALPARALEGAL.EDU](http://nationalparalegal.edu)

Ideas in Math: MAT-201

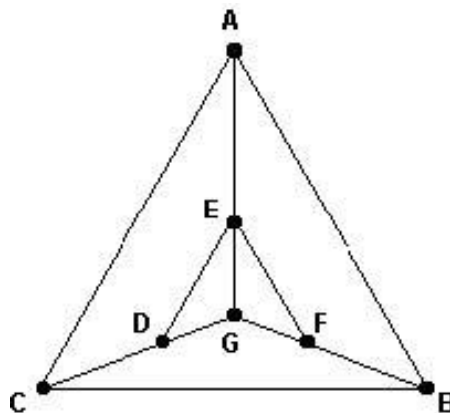
Assignment #2

- 1) Use the letters labeling the vertices to describe a Hamiltonian circuit for the graph below.



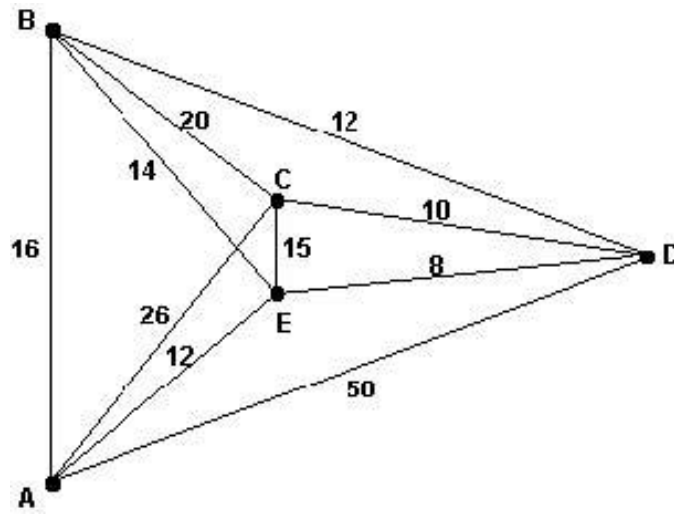
Ans:

- 2) Use the letters labeling the vertices to describe a Hamiltonian circuit for the graph below



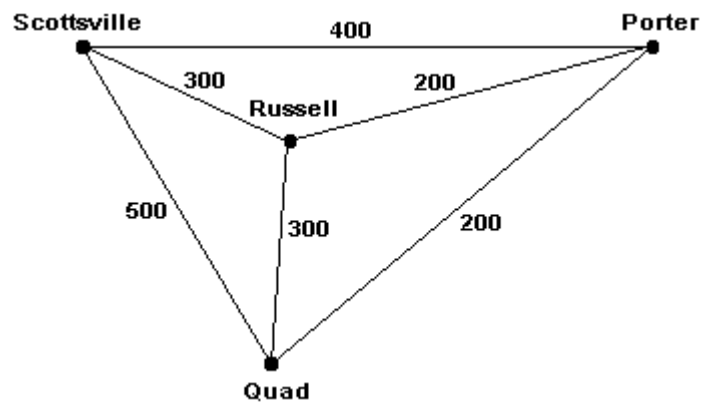
Ans:

- 3) For the graph below, compute the cost of the Hamiltonian circuit obtained by using the nearest-neighbor algorithm, starting at A?



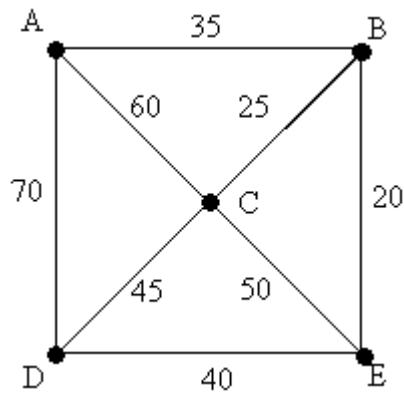
Ans:

- 4) Use the brute force algorithm to solve the traveling salesman problem for the graph of the four cities shown below.



Ans:

- 5) For the graph below, what is the routing produced by using the sorted-edges algorithm to solve the traveling salesman problem.



Ans:

- 6) The local cafe offers three different entrees, 10 different vegetables, and four different salads. A "blue plate special" includes an entree, a vegetable, and a salad. How many different ways can a special be constructed?

Ans:

- 7) "A Thousand Choices Ice Cream" wants to offer at least a thousand different choices for its customers. Assuming each customer will order a cone, ice cream flavor, topping, hot topping how would they create thousand different choices?

ANS:

Cone

Ice Cream Scoop

Topping

Hot Topping

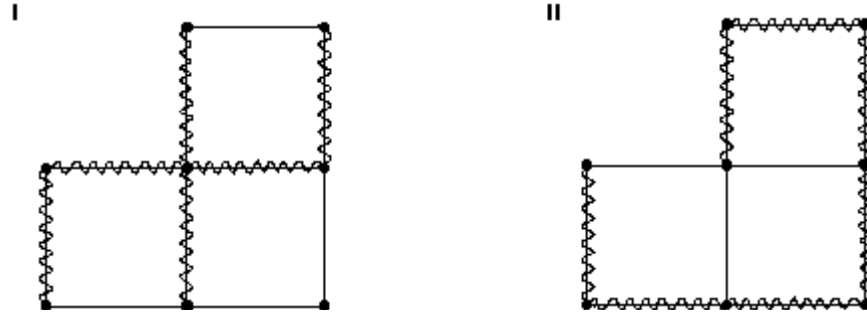
- 8) What is an advantage of a *heuristic* algorithm?

Ans:

- 9) The route of a neighborhood garbage truck generally follows an Euler circuit. Under what circumstances should it instead follow a Hamiltonian circuit?

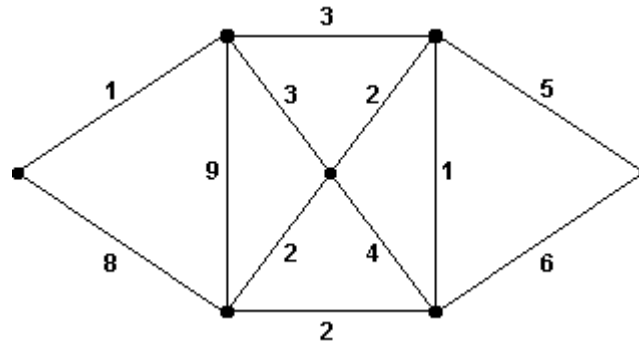
Ans:

- 10) For each of the two diagrams, do the wiggled edges represent spanning trees? Explain



Ans:

- 11) Use Kruskal's algorithm for minimum-cost spanning trees on the graph below. Compute the cost of the tree you found



Ans:

- 12) Suppose a pizza delivery person needs to take pizzas to 10 houses in different neighborhoods and then return to pick up the next set to be delivered. Indicate whether each technique is likely to be useful in solving this problem.
- A) finding an Euler circuit on a graph.
 - B) applying the nearest-neighbor algorithm for the traveling salesman problem.
 - C) applying Kruskal's algorithm for finding a minimum-cost spanning tree for a graph.

Ans: A.

B.

C.

- 13) Suppose a college campus decides to install its own phone lines connecting all of the buildings where calls may be relayed through one or more buildings before reaching their destination. Indicate whether each technique is likely to be useful in solving this problem.
- A) finding an Euler circuit on a graph.
 - B) applying the nearest-neighbor algorithm for the traveling salesman problem.
 - C) applying Kruskal's algorithm for finding a minimum-cost spanning tree for a graph.

Ans: A.

B.

C.