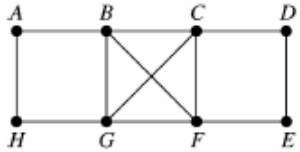
Hamilton Paths, & Circuits

7. In the following graph, determine a Hamilton circuit.

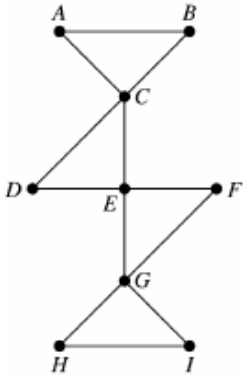


8. The Albertsons are visiting colleges for their daughter Rebecca in four different cities in Ohio. The Albertsons live in Cleveland, Ohio and are travelling to Columbus, Cincinnati, Akron, and Athens. How many ways can the Albertsons visit each city and return to their home in Cleveland?

9. Ignacio lives in Houston, Texas and has job interviews in Philadelphia, Pennsylvania; Miami, Florida; and San Diego, California. The cost of one-way flights between these four cities are as follows: Houston to Philadelphia is $225, Houston to Miami is $197, Houston to San Diego is $335, Philadelphia to Miami is $260, Miami to San Diego is $400, and Philadelphia to San Diego is $445.

    a) Represent this traveling salesman problem with a complete, weighted graph showing the prices of flights on appropriate edges.
    b) Use the brute force method to determine the least expensive route for Ignacio to visit each city once and return home to Houston. What is the cost when using this route?
    c) Use the nearest neighbor method to approximate the optimal route for Ignacio to visit each city once and return home to Houston. What is the cost when using this route?

7. In the following graph, determine a Hamilton circuit.

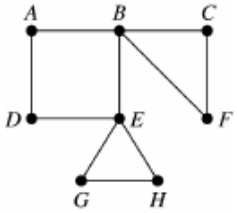


8. Kevin has four errands to run. He needs to go to the grocery store, the bank, the drug store, and the library. How many different ways can Kevin do each errand and return home?

9. Yvonne is taking time off from her job in Topeka, Kansas and visiting several National Parks. She would like to visit Yellowstone, Yosemite, and Grand Canyon National Parks. The cost of one-way flights between these places are as follows: Topeka to Yellowstone is $275, Topeka to Yosemite is $303, Topeka to Grand Canyon is $400, Yellowstone to Yosemite is $150, Yellowstone to Grand Canyon is $240, and Grand Canyon to Yosemite is $165.

   a) Represent this traveling salesman problem with a complete, weighted graph showing the prices of flights on appropriate edges.
   b) Use the brute force method to determine the least expensive route for Yvonne to visit each city once and return home to Topeka. What is the cost when using this route?
   c) Use the nearest neighbor method to approximate the optimal route for Yvonne to visit each city once and return home to Topeka. What is the cost when using this route?

7. In the following graph, determine a Hamilton circuit.



8. Alicia lives in Washington, D.C. and wants to take a road trip to visit her friends from college who live in the following cities: New York, Boston, Philadelphia, Dover, and Baltimore. How many ways can Alicia visit each city and return home to Washington, D.C.?

9. Robert decides to take a walk to run his errands. He needs to walk to the drug store, the post office, and the dry cleaners. The distances between these four locations are as follows: home to the drug store is 0.6 miles, home to the post office is 0.5 miles, home to the dry cleaners is 0.7 miles, the drug store to the post office is 0.2 miles, the drug store to the dry cleaner is 0.5 miles, and the dry cleaner to the post office is 0.2 miles.

   a) Represent this traveling salesman problem with a complete, weighted graph showing the prices of flights on appropriate edges.
   b) Use the brute force method to determine the shortest route for Robert to visit each location once and return home. What is the distance when using this route?
   c) Use the nearest neighbor method to approximate the optimal route for Robert to visit each location once and return home. What is the distance when using this route?