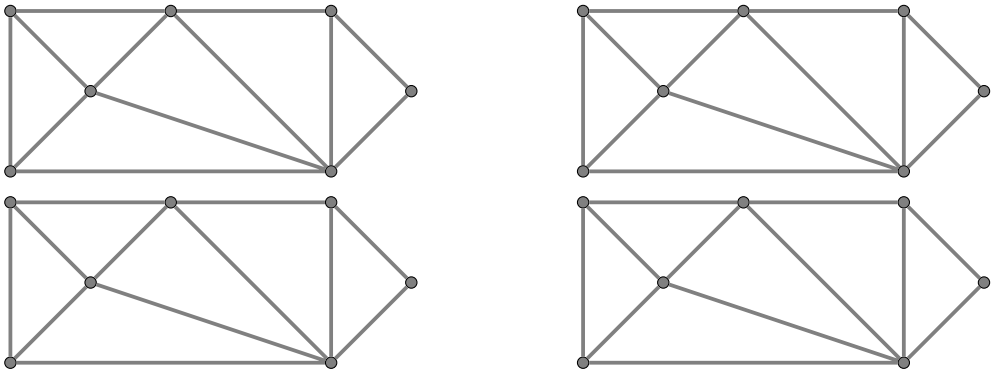
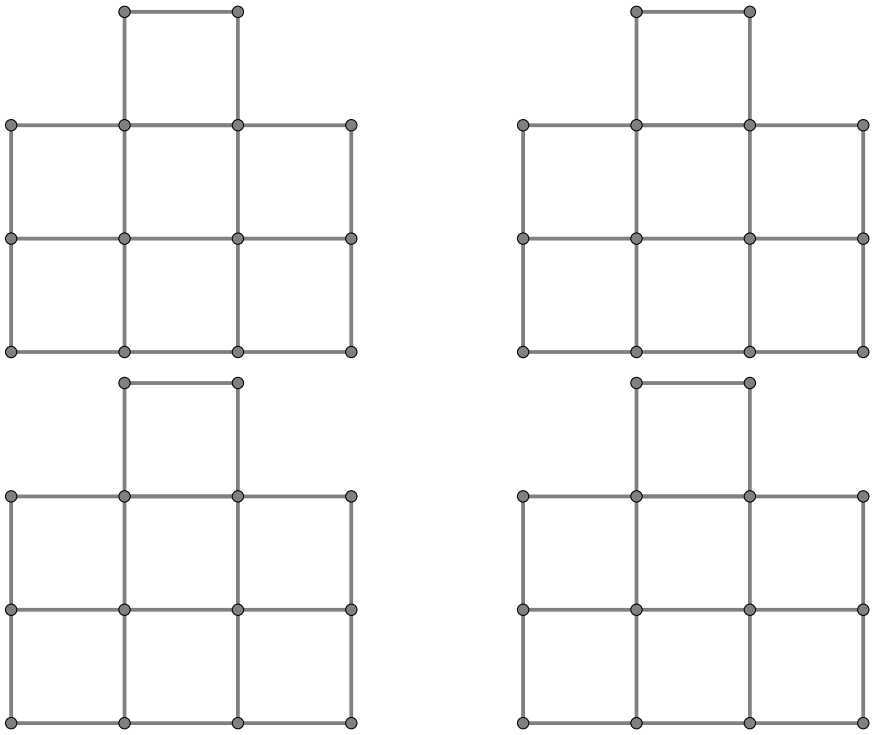
Math 1015: Homework #10

Question 1. For each part find a minimum duplication circuit, and a minimum duplication path. I'll give you several pictures in case you mess it up.

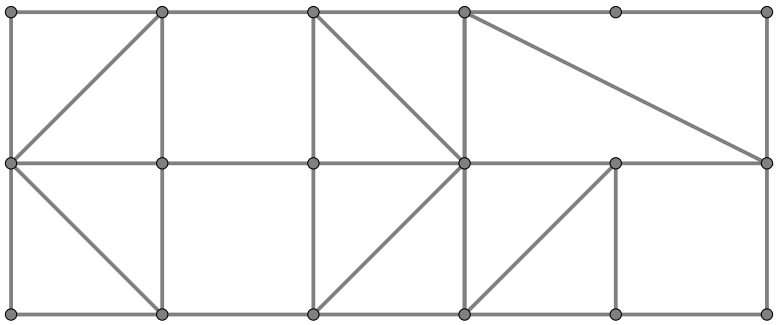
a)



b)



Question 2. Both parts are about this graph:



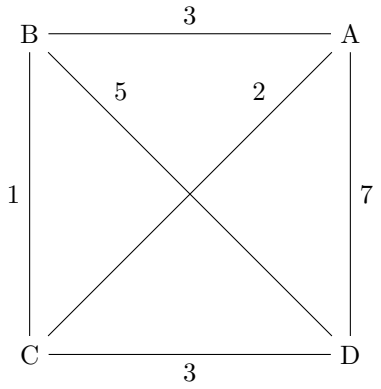
a) Please explain why there is an Euler path.

b) Please indicate on the graph which edges you would duplicate in order to form a minimum duplication circuit.

c) Please explain why it's not very interesting to find a minimum duplication path, given what you've already done.

Question 3. We said in class that the brute-force method always finds the best possible solution to the Traveling Salesman Problem, while the nearest-neighbor and the sorted-edges sometimes find answers which aren't very good. In this case, what is the point of using nearest-neighbor or sorted-edges at all?

Question 4. For this graph:

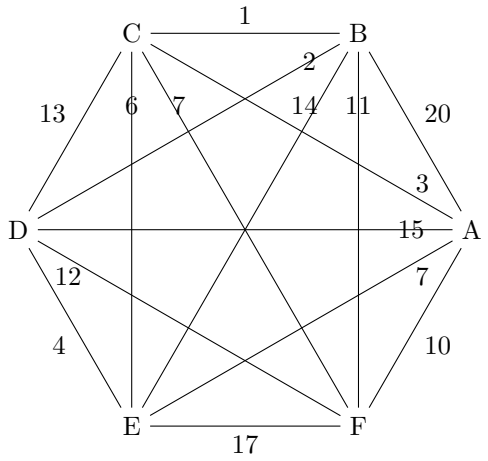


a) Please find the best possible solution to the Traveling Salesman Problem starting at A using the brute force algorithm.

b) Please find an approximate TSP solution starting at A using the Nearest Neighbor algorithm. Did the Nearest Neighbor algorithm give the best possible solution to the Traveling Salesman Problem?

c) Please find an approximate TSP solution using the Sorted Edges algorithm. Write your answer so that it starts and ends at A. Did the Sorted Edges algorithm give the best possible solution to the Traveling Salesman Problem?

Question 5. Consider this weighted graph:



a) Please use the Nearest Neighbor algorithm starting at A to find an approximate solution to the TSP.

b) Please use the Sorted Edges algorithm to find an approximate solution to the TSP. Write your answer so that it starts and ends at A.