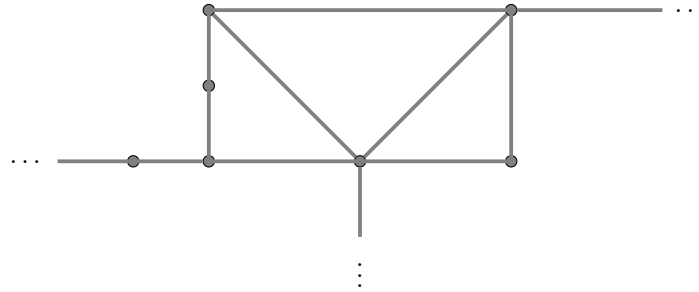


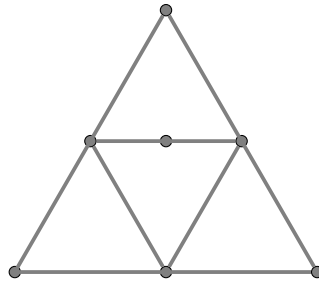
Math 1015: Homework #10

Question 1. This is a small portion of a larger graph:



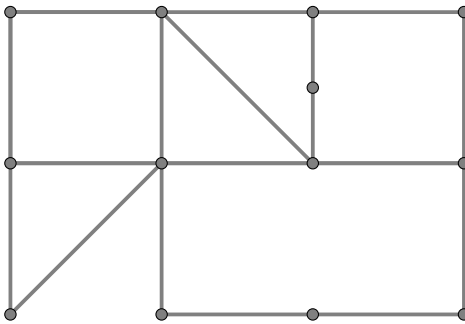
- Draw this graph, and indicate any edges which *must* be used in a Hamilton circuit, if it exists.
- Draw the graph again, indicating any edges which you know *cannot* be used in a Hamilton circuit, given the ones that you have already chosen in the previous part.
- Assuming additionally that we must use the edge which leaves the picture on the right side, decide for each of the other edges whether or not it would be used in a Hamilton circuit.

Question 2. Please explain why no Hamilton circuit can exist in this graph.

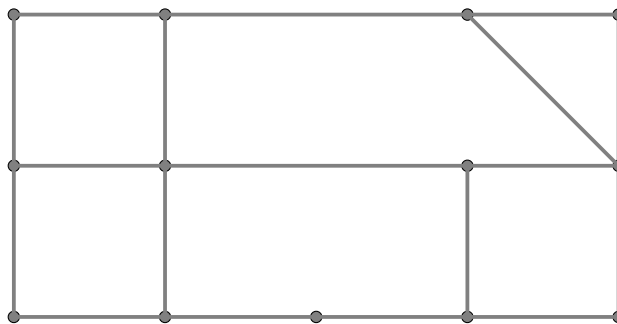


Question 3. For each of these, please find a Hamilton circuit in this graph, or explain that none can exist. (You should use the method we described in class— this will involve no guessing.)

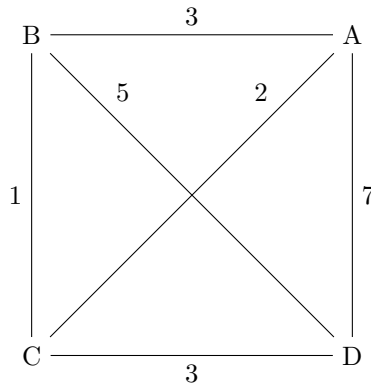
a)



b)



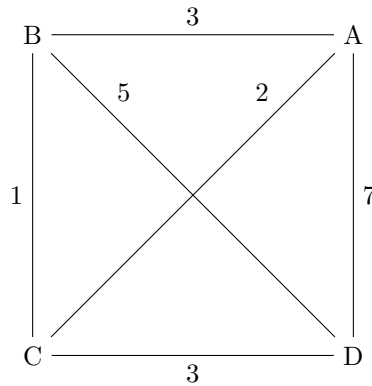
Question 4. For this graph:



Please find the minimal weight Hamilton circuit starting at A using the brute force algorithm.

Question 5. We said in class that the brute-force method always finds the best possible Hamilton circuit, 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?

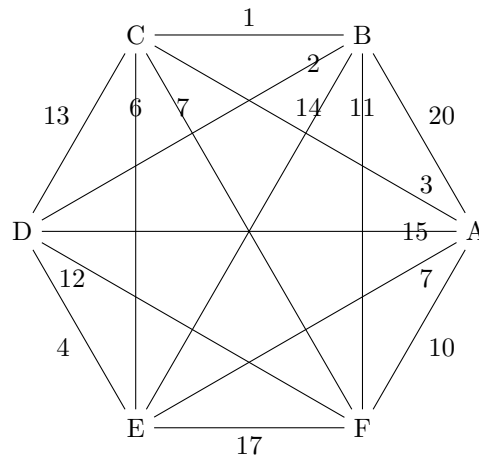
Question 6. For this graph:



- Please find a good Hamilton circuit starting at A using the Nearest Neighbor algorithm.
- Please find a good Hamilton circuit starting at A using the Sorted Edges algorithm.

Question 7. Please invent an example weighted graph where the sorted edges procedure does not choose the best possible Hamilton circuit.

Question 8. Consider this weighted graph:



- Please find the Hamilton circuit produced by the sorted edges procedure.
- Please use the repeated nearest neighbor algorithm to find a low-cost Hamilton circuit.
- Which of these procedures yielded better results?