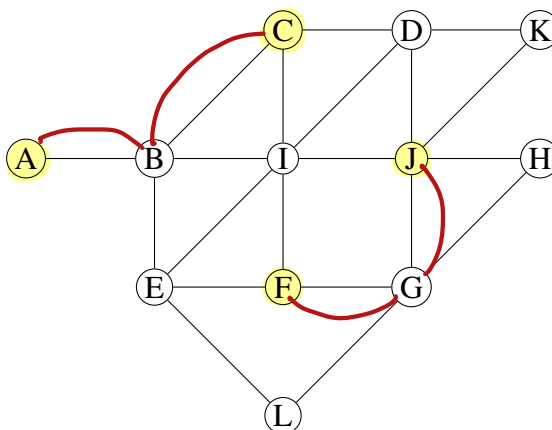


Name: Solutions score: _____ / 10

There are 10 points possible on this quiz. No aids (book, notes, etc.) are permitted. You may use a non-programmable calculator. **Show all work and supporting calculations for full credit. Explain how you get your answers.**

1. Consider the following graph.



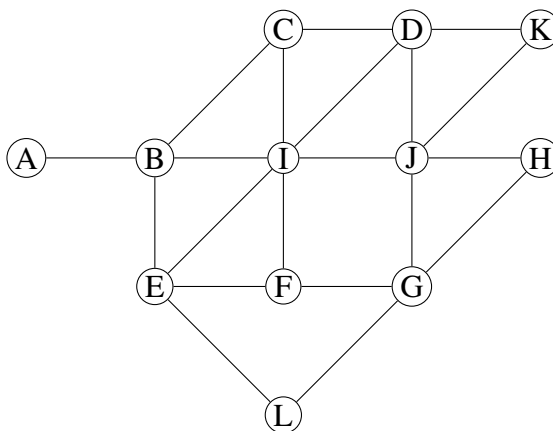
- (a) (2 point) This graph does **not** contain an Euler circuit. How can you tell?

There are 4 odd-degree vertices, highlighted above.

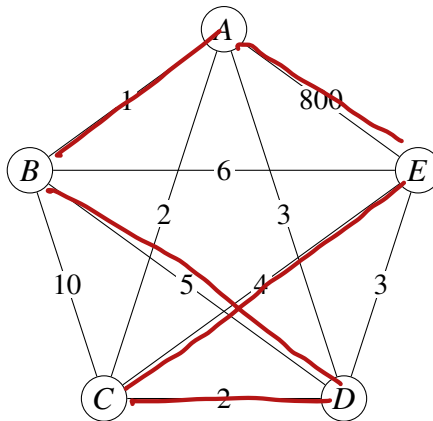
How do we know 4 is the min # edges? There are 4 odd-deg vtx so to duplicate using 3 or fewer edges, one pair would have to be connected with an edge, which is not the case. So 4 is optimal.

- (b) (3 points) **Eulerize** the graph using as few edge duplications as possible. You may do so on the graph provided above, but you must also list your duplicated edges below. Another copy of the graph is provided below in case you need to make corrections. If you do work on both graphs, please *clearly indicate which one contains your final answer*.

Write your duplicated edges here: AB, BC, FG, GJ



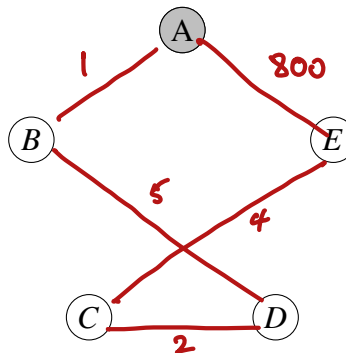
2. Consider the following graph.



- (a) (3 points) Use the **Nearest Neighbor** (NN) algorithm starting at vertex A to find a Hamiltonian circuit. You should draw your circuit below, and also give your answer as a list of vertices, along with the total weight.

Order Added

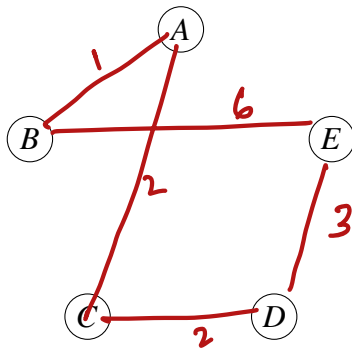
AB
BD
DC
CE



Circuit (List vertices): A B D C E A

Total weight of circuit: 812 (ugh!)

- (b) (2 points) Can you find a lower weight Hamiltonian circuit than the one you found in part (a)? If so, draw the circuit below, list the vertices in order, and state the total weight. If not, explain why it is not possible.



You can provide any cheaper circuit to answer this question.

Cheaper circuit, if possible (list vertices): A B E D C Total Weight 14