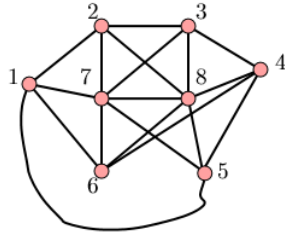Quiz 9 Solution.

Problem 1a. Explain why this graph is Eulerian.

Solution: The degree sequence of this graph is $6, 6, 4, 4, 4, 4, 4, 4$. As the degree of every vertex is even and the graph is connected, by theorem learned in class/recitation, the graph will be Eulerian.

Problem 1b. Use the algorithm developed in class, with vertex 1 as the source, in order to find an Eulerian circuit in the above graph.

Many possible examples exist. Just remember to avoid traversing across a bridge (cut-edge) if doing so would disconnect the graph and remove your ability to return to the remaining edges.

One such example would be the multicycle: (123451675864837827).

Problem 2. Is the graph $K_{8,8}$ Hamiltonian?

Yes. Label the vertices in each part as $a_1, a_2, \ldots, a_8, b_1, b_2, \ldots, b_8$ respectively. One such example of a Hamiltonian circuit is $a_1 b_1 a_2 b_2 a_3 b_3 \ldots a_8 b_8 a_1$. Many other examples exist, but suffice to say that when creating such a circuit, you have the option of continuing to any unused vertex in the other part and once all vertices have been visited returning to the starting vertex.