BBM 205 - Discrete Structures: Quiz 6 - Solutions
Date: 20.11.2018

Name:
Student ID:

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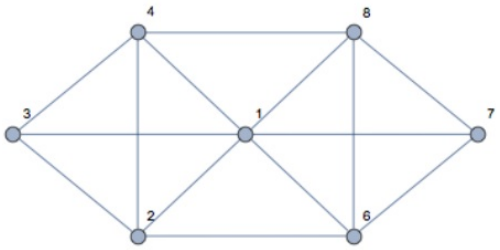


1. (a) (3 points) Is there an Eulerian tour in the graph above?

   Solution: No.

   (b) (3 points) Is there an Eulerian walk in the graph above?

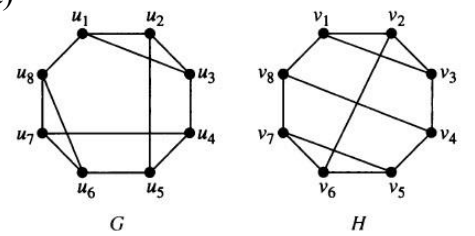
   Solution: Yes, the order of vertices on the walk is: 3-4-2-3-1-6-2-1-4-8-1-7-8-6-7.

   (c) (4 points) What is the condition that there is an Eulerian walk in an undirected graph?

   Solution: Only two of the vertices have odd degree and all other vertices have even degree.

2. (10 points) Determine if the two graphs below are isomorphic. If they are, provide an isomorphism function. If not, explain why.

a)



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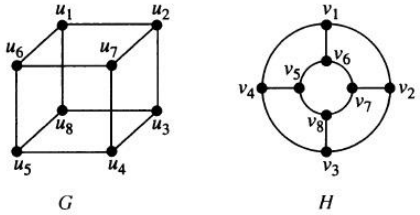
b)



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Solution:

(a) Yes. The isomorphism function is as follows:

$$f(u_1) = v_2, f(u_2) = v_1, f(u_3) = v_3, f(u_4) = v_4,$$
$$f(u_5) = v_8, f(u_6) = v_7, f(u_7) = v_5, f(u_8) = v_6.$$

(b) Yes. The isomorphism function is as follows (note that there can be more than one isomorphism function in this example):

$$f(u_1) = v_1, f(u_2) = v_2, f(u_3) = v_7, f(u_4) = v_8,$$
$$f(u_5) = v_5, f(u_6) = v_4, f(u_7) = v_3, f(u_8) = v_6.$$