CSI 35, Homework 8 on section 10.1 - 10.3

Extra Credit

Due by Wed, Nov 9.

Here are ten questions for you to try. They are extra credit so you can use them to make up for any earlier low scores.

Write all your working out and answers on your own notepaper. Please use lots of space. It is very important that you show clearly any work you had to do to get your answers.

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(1) What kind of graph would be best to model the NYC subway system. Explain if multiple edges, loops or directed edges would be needed.

(2) **(a)** Draw a graph with 6 vertices so that the vertices have degrees $2, 2, 5, 5, 5, 5$ respectively.

    (b) What does the Handshaking Theorem say about this graph?

    (c) Check that the Theorem is true for the graph you drew.

(3) Page 665, Question 8

(4) Draw each of these graphs:

    (a) K_7 **(b)** $K_{1,7}$ **(c)** $K_{3,4}$ **(d)** C_7 **(e)** W_7

(5) Page 666, Question 24

(6) For which values of n are these graphs bipartite?

    (a) C_n **(b)** W_n **(c)** K_n **(d)** $K_{2,n}$

(7) Page 675, Question 14

The next three questions are on isomorphism. Show that the two graphs in each question are not isomorphic by finding they have different numbers of vertices, edges or different degrees. Or show that they are isomorphic by using a function f to match their vertices and then show that the corresponding adjacency matrices are the same.

(8) Page 676, Question 34

(9) Page 676, Question 36

(10) Page 676, Question 38