CSci 1302 Assignment 11  
Due Wedn., December 14th

Problem 1 (4 points). Exercises 17, 18, 21, 23 p. 663.


Problem 3 (4 points). Exercises 32, 34 p. 682.


Problem 5 (6 points). 2b, 3b, 4b pp. 695-696. Also, write down the adjacency list for each of the three graphs.

Problem 6 (5 points). Exercises 7, 18 p. 696.

Problem 7 (10 points). You are given the following adjacency matrix A of an undirected graph:

\[
\begin{pmatrix}
1 & 1 & 0 & 1 \\
1 & 1 & 1 & 0 \\
0 & 1 & 0 & 2 \\
1 & 0 & 2 & 0
\end{pmatrix}
\]

1. compute \(A^2\) and \(A^3\).

2. based on the matrix \(A^2\) that you computed, how many walks of length 2 are there between the following vertices:
   - \(v_1\) and \(v_2\),
   - \(v_3\) and \(v_4\).

3. based on the matrix \(A^3\) that you computed, how many walks of length 2 are there between the following vertices:
   - \(v_1\) and \(v_1\),
   - \(v_1\) and \(v_3\),
   - \(v_3\) and \(v_3\).

4. Draw the graph according to the adjacency matrix. List all the walks of length 2 between the vertices given in part 2 and those of length 3 between the vertices given in part 3. If you seem to be getting different results from those given by the matrices, you need to check you computations in part 1 (or your graph).
**Problem 8 (4 points).** Exercises 3, 4 p. 703, 7, 8 p. 704.

**Problem 9 (8 points).** Exercises 15, 16, 17, 18 p. 721.

**Problem 10 (4 points).** Exercise 33 p. 722.

**Problem 11, The Last One! (8 points).** You are given a simple graph with the following adjacency list:

\[
\begin{align*}
v_1 &: v_2, v_5, v_7 \\
v_2 &: v_1, v_3, v_4 \\
v_3 &: v_2, v_5 \\
v_4 &: v_2, v_5 \\
v_5 &: v_3, v_4 \\
v_6 &: v_1 \\
v_7 &: v_1, v_8 \\
v_8 &: v_7
\end{align*}
\]

Show the order in which the vertices of the graph are visited in the Breadth-first Traversal (BFT) and in the Depth-First Traversal (DFT). You might want to draw the graph.