

CSci 1302 Assignment 11

Due Wedn., December 14th

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

Problem 2 (6 points). Exercise 2 p. 680.

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

Problem 4 (2 points). Exercises 39 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:

$$\begin{matrix} 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \\ 0 & 1 & 0 & 2 \\ 1 & 0 & 2 & 0 \end{matrix}$$

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:

$v_1 : v_2, v_6, v_7$

$v_2 : v_1, v_3, v_4$

$v_3 : v_2, v_5$

$v_4 : v_2, v_5$

$v_5 : v_3, v_4$

$v_6 : v_1$

$v_7 : v_1, v_8$

$v_8 : v_7$

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.