Homework Assignment 3
CSCI 2405
Spring 2020
Section 001

Due: 3/18

1. For which values of m and n is $K_{m,n}$ a tree?

2. How many vertices does a full 5-ary tree with 100 internal vertices have?

3. How many vertices and how many leaves does a complete m-ary tree of height h have?

4. How many vertices must be removed from a connected graph with n vertices and m edges to produce a spanning tree?

5. Show a diagram of a depth-first spanning tree of each of the following graphs.

   (a) K_5

   (b) $K_{3,4}$, starting at a vertex of degree 3.

   (c) Q_3

6. Show a diagram of a breadth-first spanning tree of each of the following graphs.

   (a) K_5

   (b) $K_{3,4}$, starting at a vertex of degree 3.

   (c) Q_3

7. What does a depth-first spanning tree of K_n look like for positive integers n?

8. What does a breadth-first spanning tree of K_n look like for positive integers n?

9. Show a backtracking tree that finds a subset, if it exists, of set 27, 24, 19, 14, 11, 8 with sum

   (a) 20

   (b) 41

(c) 60

10. Characterize the number of trees in a spanning forest of a graph in terms of the graph's connectivity.

11. How many edges must be removed from a graph with n vertices, m edges and c connected components to produce a spanning forest?