Fall 1999 **CMSC 651: Homework 2** Samir Khuller

Due in class: Oct 6.

In general, I expect people to write their own (and original?) solutions to homeworks. The study groups are there for you to talk about other problems on the book that you tried to solve, material covered in class and strategies for approaching problems etc.

(1) Problem 22-1 [CLR] page 458.

(2) Provide details of Boruvka's algorithm. Avoid using the union-find data structure (Boruvka came up with his algorithm well before union by rank and path compression were discovered!).

(3) Problem 21.3-1 (page 435). Suppose that a root x in a Fibonacci Heap is marked. Explain how x came to be a marked root. Argue that it does not matter to the analysis that x is marked, even though it is not a root that was first linked to another node and then lost one child.

(4) Problem 21.4-1 (page 438). Show that for any positive n, there is a sequence of F-heap operations that creates an F-heap consisting of one tree that is a linear chain of n nodes.

(5) Problem 21-1 (page 438).