Problem 1. Disjoint Sets
a) Weiss problem 8.1 (b) and (c) only. You do not need to show all the intermediate results, but, as usual, including at least some of them will help us if it is necessary to award partial credit.

b) Weiss problem 8.2. If there is more than one possible answer, simply choose one of them.

c) Weiss problem 8.4.

Problem 2. Topological Sort
Topological sort is discussed in section 9.2 of Weiss. Though we haven’t covered it in class yet (at the time of assigning this homework), it is well-explained in the text and is quite straightforward. Read and learn.

a) Weiss problem 9.1. Use a queue during the sort, and assume that the vertices appear on an adjacency list in alphabetical order.


Problem 3. Extra Credit
The input to this problem consists of a list of 7-digit phone numbers written as simple integers (e.g., 5551212 represents the phone number 555-1212). No number appears in the input more than once, but there is no other limit on the size of the input.

Write a program that prints out the phone numbers in the list in ascending order.

Your solution must obey the following constraint: it must not use more than 2MB of memory. (And, of course, it cannot use any external storage — disks, tapes, punched cards, iPods, the network, etc.)

Extra-Extra Credit: Implement your solution to this problem in C, C++, Java, or some other similar language.

Extra-Extra-Extra Credit: Implement your solution in x86 assembly language. Try to use as few instructions as possible. (You may substitute a different assembly language, but it would be best if it were one that someone on the course staff has seen before. Please check with us first if you want to use assembly language for some machine other than x86.)