

**CS 181b**  
Advanced Topics in Algorithms  
Spring 2002  
Problem Set 2a  
Due Thursday, January 31 in class

1. **[20 Points] ACN Programming Competition!** You are competing in the International ACN (Association of Computer Nerds) Programming Competition. In one of the programming problems, you need to implement a queue. Unfortunately, you are pressed for time. Fortunately, you already have good working code for a stack. You may assume that the stack is implemented efficiently and supports operations PUSH, POP, and SIZE (which returns the number of items on the stack) in time  $O(1)$ . Show how 2 stacks can be instantiated to implement a queue. Moreover, show that the amortized running time for ENQUEUE and DEQUEUE are  $O(1)$  using this 2-stack implementation.