

ECE 1320 Optimization Methods
Winter 2003

Homework 6: Due in class Thursday February 27 2003

- This test contains 3 problems. They allow you to earn 100 points.
- Show your work, as partial credit can be given. You will be graded not only on the correctness of your answer, but also on the clarity with which you express it. **Be neat.**
- **No late submissions will be accepted.**
- Only homework returned in a 9in \times 12in envelope will be accepted. (If you cannot find such envelope, ask the Instructor.) Please, write your name and the class name (ECE 1320) on the envelope (write clearly, please).
- For the six problems an e-mail to the TA should be sent that contains the code and the executable of a program that implements the solutions to the problems as functions.

Write your name here: _____

- **Problem # 1 [25 points]**. Define a new class *stack* that implements a *linked stack* according to the definition given in class, and to the “classic” definition of stack that can be found in any book on data structures (e.g., in the textbook from page 119 to page 125). You might want to define auxiliary classes as well, such as the class that defines objects that are “stack nodes.”
- **Problem # 2 [25 points]**. Define a new class *queue* that implements a *linked queue* according to the definition given in class, and to the “classic” definition of queue that can be found in any book on data structures (e.g., in the textbook from page 128 to page 133). You might want to define auxiliary classes as well, such as the class that defines objects that are “queue nodes.”
- **Problem # 3 [50 points]**. A *palindrome* is a string of characters that reads the same forwards as backwards. Write a Boolean C++ function that using only a constant number of stacks and queues (and no other data structures) and a constant number of integer and character variables determines if a given string is a palindrome. Assume that the string is input by the user one character at a time (the user enters the character '#' to indicate that s/he has finished entering the string).