The Final examination will be Tuesday, Dec.15, from 8 - 9:50 AM in ITT 328. It will be closed book and notes, except for three 8.5" x 11" sheets of paper (front and back) with notes. The test will be comprehensive, but focus on material covered since test 2.

New topics covered since Test 2 on the Final exam are:

**Chapter 9. Pointers**
- Declaration of a pointer variable using ‘*’, e.g., "int * myPtr;"
- Address of operator (&) and indirection operator (*)
- Relationship between arrays and pointers
- Pointer arithmetic, “walking” pointers down an array, comparing pointers
- Pointers as function parameters (relationship between pointer parameters and pass-by-reference), returning pointers from functions
- Dynamic memory allocation, null pointer

**Chapter 10. Characters, Strings and the string Class**
- General idea of the C++ library functions for characters (cctype): isalpha, toupper, etc.
- General idea of the C++ library functions for C-Strings (cstring): strlen, strcpy, etc.
- C++ string class: definition of string objects, supported string operators (>>, <<, =, etc.), and string class member functions (append, length, c_str, find, replace, etc.)
- getline

**Chapter 11. Structured Data (skip section 11.11 on Union)**
- Definition of a structure (struct)
- Accessing structure members using the dot operator (.)
- Array of structures
- Structures as function arguments
- Returning a structure from a function
- Pointers to structures ("->" operator)
- Enumerated data types

**Chapter 19. Recursion (skip sections 19.3, 19.5, and 19.7)**
- General idea of recursion (be able to trace recursion using the run-time stack)
- Recursive examples of “study”: countDown, power, factorial, fibonacci, binary search, merge sort (from class), quick sort
- Problem of solving fibonacci recursively via recursive divide-and-conquer algorithm (lab 14), and the general solution using dynamic programming (lab 14)