CSCI 2170   Spring 2006
Review for test 1 (February 9th)

- 1D, 2D and parallel array

- struct type
  - define struct type
  - member access
  - function with struct type parameter
  - array of structs
    - access member of an array element
    - iterate through members of an array
    - sort an array of structs
    - pass struct array to function

- enumeration type

- typedef
  - create alias of existing type and user defined type using typedef

- conditional compilation (#ifndef / #define / #endif)

- ADT
  - What is an ADT?
  - What is data abstraction?
  - How is information hiding achieved in data abstraction?
  - Define data and operation of an ADT

- C++ class
  - What is a constructor?
  - What is a destructor?
  - When are constructor and destructor called?
  - What is default constructor?
  - What is copy constructor?
  - When is it necessary to provide explicit destructor for a class?
  - Why are there private and public member functions?
  - How some class members are defined as private while others are public?
  - What is an object? How to create an object?
  - What is data encapsulation?
  - **Be able to define and implement a class given description**
  - Be able to compile and execute programs using separate header and implementation files
  - Be able to implement an array-based implementation of the ADT list
  - Be able to define overloaded functions and overloaded operators for a given class

Sample Questions:

- struct related
    1. Define an enumeration type "HouseType" which can be used to represent different types of houses. The type of houses included in this type are : Colonial, Cape Cod, Georgian, Victorian, and Contemporary.
    2. Define a struct type "HouseStruct" that can be used to store information about a house that is currently for sale. Each house record should include the following information:
        - Price of the house;
        - Date the house was built; ← define a struct DateStruct for this
        - Square footage of the house;
        - Number of bedrooms in the house;
        - Number of bath rooms in the house;
        - Type of house; ← use the type defined in question 1
    1. Create an array "AllHouses" of size 2000 of type "HouseStruct"
    2. Write a function "ReadData" that will read information about houses that are on the market from a data file, called "HouseInfo.dat". Each record is stored in the data file one piece of information per line, like this:
        - 210000
        - 5 12 2002
        - 3200
        - 4
        - 2
        - Colonial
    3. Write a function "SortByPrice" which sorts all house records in ascending order of price.
    4. Write a function "SearchByPrice" which displays all houses that have price between "minPrice" and "maxPrice" supplied by the user.
    5. Write a function "SearchByStyle" which displays all houses that have the same style as the one supplied by the user.

- **class related**
    1. Define a class "randomNumberClass". Show the header file and the implementation file.
        The data of the class include:
        - Random number : a random number in the range [lower, upper]
        - Lower: lower bound of the random number generated
        - Upper: upper bound of the random number generated

        The member functions of the class include:
        - Default constructor: Create a random number object that generates random number in the range of [0, RAND_MAX]
        - Second constructor: Create a random number object that generates random number in the range of [lower, upper], where "lower" and "upper" are supplied by the client program
        - Copy Constructor:
        - Draw : Generate and return a random number in the defined range
        - DisplayRange: Display the range defined for this random number generator
        - SetRange: Change the range (both lower and upper) values that supplied by the client program.
        - Overloaded assignment operator