Gebze Institute of Technology
Department of Computer Engineering
CSE 241/501
Object Oriented Programming
Fall 2014
Homework # 8
Due date Dec 16th 2014

In this homework, you will write a set of templated classes in a hierarchy. These classes are
- Abstract base class Container: Container is a templated abstract class that can hold a group of values of templated type. This class will have pure virtual functions for
  - add : adds an element to the container, throws exception if there is an error
  - remove: removes an element from the container, throws exception if there is an error
  - delete: deletes an element from the container, throws exception if there is an error
  - search: searches an element in the container, throws exception if there is an error
  - first: returns the first element of the Container
  - next: returns the next element of the Container since the last call to the function next. If function first is called before this function, it returns the second element.
  - Also write other useful pure virtual functions here such as size and empty.
- Container class will have the following concrete functions, these functions will not be redefined or overridden
  - addAll: takes a Container reference as parameter and adds the contents of the other Container to this Container
  - removeAll: takes a Container reference as parameter and removes the contents of the other Container from this Container
  - toVector: converts the Container to an STL vector and returns it

The following concrete classes will derive from Container.
- SetContainer is a container class, it does not allow any repeated elements, each element is unique
- SortedSetContainer is a container class, it is like SetContainer but it keeps its elements always sorted
- SortedContainer is a container class, it keeps its elements sorted but allows duplicate elements

Write a global function that takes an array of Container pointers. This function will return the tottal number of elements in the sorted containers only.

Test each of your classes and your function with several examples and attach your test results.

Below are other rules
- You may use STL classes to keep elements
- Use name spaces and separation of interface and implementation, and other good programming practices