University of Dhaka
Dept. of Computer Science and Engineering
2nd Year 1st Semester, Academic Year: 2021
CSE-2112: Object Oriented Programming Lab
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Lab 6: Lab Exam 2
Date   : March 3, 2022

Solve the following problem and submit the source files **in a zipped folder**.
Submission time ends at 12.25 PM. No late submission is allowed and no penalty system exists.

In this experiment you will build a class hierarchy for list data structure along with some standard operations. To maintain our simplified list, you should maintain two things: a 100-element integer array and a variable called "head" that indicates the last element of the array.

In this experiment, we will be dealing with integer lists only. There may be two types of integer lists: sorted and unsorted. A sorted list is always kept sorted whereas an unsorted list is not.

Every list has the following functions: adding an element, removing an element, searching for an element, and showing the contents of the entire list. Of these functions, showing a list, i.e., displaying the content of the array, is identical for all types of lists. Searching for an element may be efficiently implemented in a sorted list. Add and remove operations must be different in sorted and unsorted lists.

On top of your class hierarchy, you should have an interface where you should put the methods that differ among various types of lists, such as add. This interface should be implemented by a class named `myList` where you should put the common code. There should be at least two levels of inheritance/implementations in your hierarchy, i.e., three levels of classes.

Add a `demo` class that demonstrates all the functions with a variable of type `myList` but referring to objects of (a) sorted list and (b) unsorted list.

As always, you should try to use maximum code reuse as well as maximum ease of coding.