

# DSA Problem Sheet

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(Lab Evaluation)

## Question

In today's lab, you are being provided with a segment of code that reads an integer list (all values are distinct) from the file and creates a class object *list1* which contains the array of integers (check the class definition). Write functions that perform each of the following tasks.

**Note: None of those functions below have direct access to the list. You may have to use the *swap()* and *compare()* functions appropriately**

1. **int getIndexOfSecondLargest(class list lst):** Returns the index of the second largest element in the list.
2. **bool isSorted(class list lst):** Returns true (1) if the list is sorted and false (0) otherwise
3. **int quickFix(class list lst,int i):** Places the *i*th element in *lst* in an appropriate place *j* (as in quick sort) and rearranges the elements such that all the elements in the list to the left of *lst[j]* are less than *lst[j]* and all the elements to the right are greater than *lst[j]*. Further, the function returns the index *j* at which the element gets placed. Each element in the list can participate in at most two swaps.
4. **int findkSmallestIndexPartiallySorted(class list lst,int k):** Returns the index of the  $k^{th}$  smallest element in the list. The input list is of even size and guaranteed to have first half of the list and the second half independently sorted. Your function is not supposed to modify the list (You may assume *k* to be less than *n*).

You may uncomment the appropriate statements in the main function to test your code.