Lab Mid Term Exam

Marks

1. Write a program to reverse an array. 10

Sample input	Sample output
5 6 2 3 3 5	5 3 3 2 6

2. Write a program to remove duplicate numbers from an array and print the remaining elements in sorted order. You have to do this in O(nlogn). 15

Sample input	Sample output
5 6 3 2 3 5	2 3 5 6

3. Write a program to sort the numbers in non-increasing order using quick sort. You have to take random index as a pivot element. 15

Sample input	Sample output
5 6 3 2 3 5	6 5 3 3 2

4. Write a recursive function to check if a given word is a palindrome. 15

Sample input	Sample output
abcba	Yes
abcaa	No

A palindrome is a word which reads the same forward and backward.

5. Write a recursive function to find the maximum element in an array. 15

Sample input	Sample output
5 1 3 5 2 4	5

6. Take the Singly linked-list class from Github. 15

Link:
https://github.com/phitronio/Data-Structure-Batch2/blob/main/Week%204/Module%2013/1.cpp

Add the following functions to the class.

- **int getLast()** -> This function will return the last node of the linked list. If the linked list is empty then return -1.
  Sample Input: [3, 2, 6, 4, 5]
  Sample Output: 5
- **double getAverage()** -> This function will return the average of all elements in the linked list.

Sample Input: [3, 2, 6, 4, 7]
Sample Output: 4.4

7. Take the Doubly linked-list class from Github. 15
   Link:
   https://github.com/phitronio/Data-Structure-Batch2/blob/main/Week%204/Module%2014/1.cpp
   Add the following functions to the class.
   - **void swap(i , j)** -> This function will swap the i-th index and j-th index.
     Sample Input: [3, 2, 6, 4, 7], i = 1, j = 4
     Sample Output: Doubly Linked list containing the elements [3,7,6,4,2]
   - **void deleteZero()** -> This function will delete all the nodes that have data=0.
     Sample Input: [0, 2, 0, 0, 5]
     Sample Output: Doubly linked list containing the elements [2, 5]