Advance Data Structures and Algorithms Lab

Questions

Q1. Alice has given a task to Bob. She has given Bob an array of integers and some queries. There is a pointer at the starting of the array. There are 3 types of queries:

i. L X - it means shift the pointer X times left
ii. R Y- it means shift the pointer Y times right
iii. I Z N – it means insert Z numbers of element of value N right to the pointer

Find the resulting array after k queries in the array.

Example:

Array – [1,3,5,2,5]

Queries –

R 2

L 1

I 2 3

Output: 1 3 3 3 5 2 5

Find the most suitable data structure to perform the all operations. Also write a program for it.

Q2. A boat can carry at most K kgs and at most 2 persons excluding the boatman at a time. There are N peoples who want to cross the river by the boat. Find the optimize way to find number of trips that boat has to make to cross all persons from one shore to another.

Example:

Persons weight – [3,3,5,2,1,4,5,1,5]

K = 5

Ans = 6

Q3. Given a collection of candidate numbers (`candidates`) and a target number (`target`), find all unique combinations in `candidates` where the candidate numbers sum to `target`.

Each number in `candidates` may only be used **once** in the combination.

Note: The solution set must not contain duplicate combinations.

Example 1:

```
Input: candidates = [10,1,2,7,6,1,5], target = 8

Output:

[

[1,1,6],

[1,2,5],

[1,7],

[2,6]

]
```