Smart Coding & Interview Series
Top-20 Basic Program
(SortedSet & Sorted MultiSet Applications)

First, understand the solution building strategies and coding for the problems in LIVE/VIDEO session and then you apply those strategies discussed in LIVE/VIDEO session to solve the following problems. Use your favourite language(C/C++/Java/C#/Python/Scala) for coding.

1) Exam Room: In an exam room, there are N seats in a single row, numbered 0, 1, 2, ..., N-1. When a student enters the room, they must sit in the seat that maximizes the distance to the closest person. If there are multiple such seats, they sit in the seat with the lowest number(Also, if no one is in the room, then the student sits at seat number 0). Write a class ExamRoom(int N) that exposes two functions:

> ExamRoom.seat() returning an int representing what seat the student sat in, and
> ExamRoom.leave(int p) representing that the student in seat number p now leaves the room.
> It is guaranteed that any calls to ExamRoom.leave(p) have a student sitting in seat p.

Example:

```
Input: ["ExamRoom","seat","seat","seat","seat","leave","seat"],
[[10],[],[],[],[],[4],[]]

Output: [null,0,9,4,2,null,5]

Explanation:

ExamRoom(10) -> null

seat() -> 0, no one is in the room, then the student sits at seat number 0.

seat() -> 9, the student sits at the last seat number 9.

seat() -> 4, the student sits at the last seat number 4.

seat() -> 2, the student sits at the last seat number 2.

leave(4) -> null

seat() -> 5, the student sits at the last seat number 5.
```

Source: *https://leetcode.com/problems/exam-room/description/*

2) K-Empty Slots: There is a garden with N slots. In each slot, there is a flower. The N flowers will bloom one by one in N days. In each day, there will be exactly one flower blooming and it will be in the status of blooming since then. Given an array flowers consists of number

from 1 to N. Each number in the array represents the place where the flower will open in that day. For example, flowers[i] = x means that the unique flower that blooms at day i will be at position x, where i and x will be in the range from 1 to N.

Also given an integer k, you need to output in which day there exists two flowers in the status of blooming, and also the number of flowers between them is k and these flowers are not blooming. If there isn't such day, output -1.

Example :

Input:

flowers: [1,4,3,2,5]

k: 2

Output: 2

Source: *https://leetcode.com/problems/k-empty-slots/description/*

3) Hoax or what:

https://uva.onlinejudge.org/index.php?option=com_onlinejudge&Itemid=8&page=show_problem&problem=2077