**题目使用文件输入输出**

**提交程序文件名每道题有写在题目名字右侧，读入文件xxx.in，输出文件xxx.out，提交文件xxx.cpp**

**一10 二11 三10 四10**

第一题 （lineup）2s

Farmer John's N cows (1 <= N <= 100,000) are lined up in a row. Each cow is identified by an integer "breed ID" in the range 0...1,000,000,000; the breed ID of the ith cow in the lineup is B(i). Multiple cows can share the same breed ID. FJ thinks that his line of cows will look much more impressive if there is a large contiguous block of cows that all have the same breed ID. In order to create such a block, FJ chooses up to K breed IDs and removes from his lineup all the cows having those IDs. Please help FJ figure out the length of the largest consecutive block of cows with the same breed ID that he can create by doing this.

PROBLEM NAME: lineup

INPUT FORMAT: \* Line 1: Two space-separated integers: N and K. \* Lines 2..1+N: Line i+1 contains the breed ID B(i).

SAMPLE INPUT (file lineup.in):

9 1

2

7

3

7

7

3

7

5

7

INPUT DETAILS: There are 9 cows in the lineup, with breed IDs 2, 7, 3, 7, 7, 3, 7, 5, 7. FJ would like to remove up to 1 breed ID from this lineup.

OUTPUT FORMAT: \* Line 1: The largest size of a contiguous block of cows with identical breed IDs that FJ can create.

SAMPLE OUTPUT (file lineup.out): 4

OUTPUT DETAILS: By removing all cows with breed ID 3, the lineup reduces to 2, 7, 7, 7, 7, 5, 7. In this new lineup, there is a contiguous block of 4 cows with the same breed ID (7).

题意:给你一个长度为n(1<=n<=100,000)的自然数数列，其中每一个数都小于等于10亿，现在给你一个k，表示你最多可以删去k类数。数列中相同的数字被称为一类数。设该数列中满足所有的数字相等的连续子序列被叫做完美序列，你的任务就是通过删数使得该数列中的最长完美序列尽量长。

第二题 （island）

Farmer John has taken the cows to a vacation out on the ocean! The cows are living on N (1 <= N <= 15) islands, which are located on an R x C grid (1 <= R, C <= 50). An island is a maximal connected group of squares on the grid that are marked as 'X', where two 'X's are connected if they share a side. (Thus, two 'X's sharing a corner are not necessarily connected.) Bessie, however, is arriving late, so she is coming in with FJ by helicopter. Thus, she can first land on any of the islands she chooses. She wants to visit all the cows at least once, so she will travel between islands until she has visited all N of the islands at least once. FJ's helicopter doesn't have much fuel left, so he doesn't want to use it until the cows decide to go home. Fortunately, some of the squares in the grid are shallow water, which is denoted by 'S'. Bessie can swim through these squares in the four cardinal directions (north, east, south, west) in order to travel between the islands. She can also travel (in the four cardinal directions) between an island and shallow water, and vice versa. Find the minimum distance Bessie will have to swim in order to visit all of the islands. (The distance Bessie will have to swim is the number of distinct times she is on a square marked 'S'.) After looking at a map of the area, Bessie knows this will be possible.

PROBLEM NAME: island

INPUT FORMAT: \* Line 1: Two space-separated integers: R and C. \* Lines 2..R+1: Line i+1 contains C characters giving row i of the grid. Deep water squares are marked as '.', island squares are marked as 'X', and shallow water squares are marked as 'S'.

SAMPLE INPUT (file island.in):

5 4

XX.S

.S..

SXSS

S.SX

..SX

INPUT DETAILS: There are three islands with shallow water paths connecting some of them. OUTPUT FORMAT: \* Line 1: A single integer representing the minimum distance Bessie has to swim to visit all islands.

SAMPLE OUTPUT (file island.out): 3

OUTPUT DETAILS: Bessie can travel from the island in the top left to the one in the middle, swimming 1 unit, and then travel from the middle island to the one in the bottom right, swimming 2 units, for a total of 3 units.

题意农给你一张r\*c的地图，有’S’,’X’,’.’三种地形，所有判定相邻与行走都是四连通的。我们设’X’为陆地，一个’X’连通块为一个岛屿，’S’为浅水，’.’为深水。刚开始你可以降落在任一一块陆地上，在陆地上可以行走，在浅水里可以游泳。并且陆地和浅水之间可以相互通行。但无论如何都不能走到深水。你现在要求通过行走和游泳使得你把所有的岛屿都经过一边。Q：你最少要经过几个浅水区？保证有解。

第三题 （seating）

Problem 3: Tied Down [Brian Dean, 2012]

To earn some extra money, the cows have opened a restaurant in their barn specializing in milkshakes. The restaurant has N seats (1 <= N <= 500,000) in a row. Initially, they are all empty. Throughout the day, there are M different events that happen in sequence at the restaurant (1 <= M <= 300,000). The two types of events that can happen are: 1. A party of size p arrives (1 <= p <= N). Bessie wants to seat the party in a contiguous block of p empty seats. If this is possible, she does so in the lowest position possible in the list of seats. If it is impossible, the party is turned away. 2. A range [a,b] is given (1 <= a <= b <= N), and everybody in that range of seats leaves. Please help Bessie count the total number of parties that are turned away over the course of the day.

PROBLEM NAME: seating

INPUT FORMAT: \* Line 1: Two space-separated integers, N and M. \* Lines 2..M+1: Each line describes a single event. It is either a line of the form "A p" (meaning a party of size p arrives) or "L a b" (meaning that all cows in the range [a, b] leave).

SAMPLE INPUT (file seating.in):

10 4

A 6

L 2 4

A 5

A 2

INPUT DETAILS: There are 10 seats, and 4 events. First, a party of 6 cows arrives. Then all cows in seats 2..4 depart. Next, a party of 5 arrives, followed by a party of 2.

OUTPUT FORMAT: \* Line 1: The number of parties that are turned away.

SAMPLE OUTPUT (file seating.out): 1

OUTPUT DETAILS: Party #3 is turned away. All other parties are seated.

有一排n个座位，m次操作。A操作：将a名客人安置到最左的连续a个空位中，没有则不操作。L操作：[a,b]的客人离开。

求A操作的失败次数。

第四题 （squares）

Farmer John is planning to build N (2 <= N <= 50,000) square fenced-in pastures on his farm, each of size exactly K x K (1 <= K <= 1,000,000). Pasture i is centered at point (x\_i, y\_i) with integer coordinates in the range -1,000,000...1,000,000. However, in his haste to complete his plans, FJ realizes that he may have accidentally placed two pastures in locations that overlap (by overlap, this means the two pastures share a positive area in common). No two pastures share the exact same center point. Given the locations of each of the planned square pastures, please help FJ compute the area shared by the two overlapping pastures. Output zero if no two squares overlap, and -1 if overlap occurs between more than a single pair of pastures.

PROBLEM NAME: squares

INPUT FORMAT: \* Line 1: Two space-separated integers, N and K. K is guaranteed to be even. \* Lines 2..1+N: Line i+1 contains the integers x\_i and y\_i, describing the center of the ith pasture.

SAMPLE INPUT (file squares.in):

4 6

0 0

8 4

-2 1

0 7

INPUT DETAILS: There are 4 squares, each of size 6 x 6. The first square is centered at (0,0), and so on.

OUTPUT FORMAT: \* Line 1: The area shared by the two overlapping squares. Output zero if no two squares overlap, and -1 if overlap occurs between more than a single pair of pastures.

SAMPLE OUTPUT (file squares.out): 20

OUTPUT DETAILS: Pastures #1 and #3 overlap in 20 units of area.

有n个大小相同的正方形，问是否存在两个正方形有公共部分，若仅有一个公共部分，求出它的面积；若没有，输出0；否则输出-1