**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XX 二XX 三XX 四XX**

1 skicourse

## **题目描述**

Farmer John is helping to turn his large field into a ski course for the upcoming winter Moolympics. The field has dimensions M x N (1 <= M,N <= 100), and its intended final composition is described by an M x N grid of characters like this:

RSRSSS RSRSSS RSRSSS Each character describes how the snow in a unit square of the field should be groomed: either 'R' for 'rough' or 'S' for 'smooth' (the Moolympics organizers think that a course is more interesting if it has a mixture of rough and smooth patches).

To build the desired course, Farmer John plans to modify his tractor so that it can stamp any B x B patch of the field (B <= M, B <= N) with either entirely smooth snow or entirely rough snow. Since it takes a long time to reset the tractor between each of these stamps, FJ wants to make B as large as possible. With B = 1, he can clearly create the desired ski course by stamping each individual square with either R or S, as intended. However, for larger values of B, it may no longer be possible to create the desired course design. Every unit square of the course must at some point be stamped by FJ's tractor; it cannot be left in its default state.

Please help FJ determine the largest possible value of B he can successfully use.

滑雪场的设计图是一个M\*NM x N (1 <= M,N <= 100)的矩阵，每个格子里用一个字母R（表示粗糙）或者S（表示平整）。

比如：

RSRSSS

RSRSSS

RSRSSS

农民约翰的拖拉机每次可以将一块B\*B (B <= M, B <= N)的区域全部标记B\*B (B <= M, B <= N)的R或者S，他希望B能够尽量地大。一个格子可以被多次标记，下一次标记能够覆盖前一次标记，每个格子可以都至少被标记一次。

## **输入输出格式**

****输入格式：****

Line 1: Two space-separated integers M and N.

Lines 2..M+1: M lines of exactly N characters (each R or S), describing the desired ski course design.

****输出格式：****

Line 1: The maximum value of B Farmer John can use to create the desired course pattern.

## **输入输出样例**

****输入样例#1：****

3 6

RSRSSS

RSRSSS

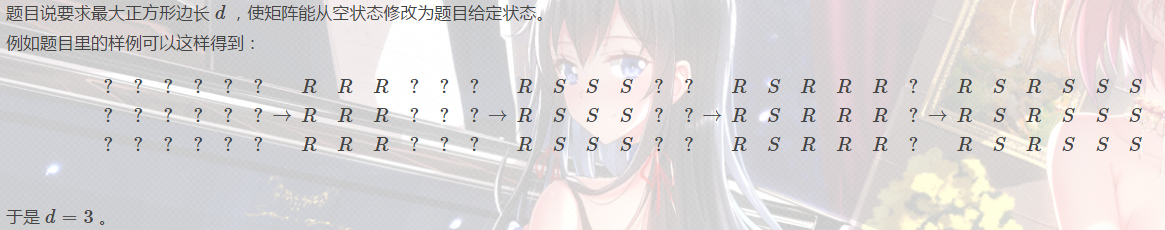
RSRSSS

****输出样例#1：****

3

## **说明**

FJ can stamp a rough patch spanning columns 1-3, followed by a smooth patch spanning columns 2-4, then a rough patch spanning columns 3-5, and finally a smooth patch spanning columns 4-6.



2 skilevel

## **题目描述**

The cross-country skiing course at the winter Moolympics is described by an M x N grid of elevations (1 <= M,N <= 500), each elevation being in the range 0 .. 1,000,000,000.

Some of the cells in this grid are designated as starting points for the course. The organizers of the Moolympics want to assign a difficulty rating to each starting point. The difficulty level of a starting point P should be the minimum possible value of D such that a cow can successfully reach at least T total cells of the grid (1 <= T <= MN), if she starts at P and can only move from cell to adjacent cell if the absolute difference in elevation between the cells is at most D. Two cells are adjacent if one is directly north, south, east, or west of the other.

Please help the organizers compute the difficulty rating for each starting point.

滑雪场用一个M\*N(1 <= M,N <= 500)的数字矩阵表示海拔高度，每个数字表示一个范围在0 .. 1,000,000,000的高度。有些格子被指定为起点，组织者想对这些起点做难度评级。

如果起点P点是一个难度级别为D的起点，则D必须是满足以下条件的一个最小值：

（1）从一个格子只能滑到相邻的格子；

（2）这两个格子的海拔差不超过D；

（3）至少能够到达T（1 <= T <= M\*N）个格子（包括起点本身）。

## **输入输出格式**

****输入格式：****

Line 1: The integers M, N, and T.

Lines 2..1+M: Each of these M lines contains N integer elevations.

* Lines 2+M..1+2M: Each of these M lines contains N values that are either 0 or 1, with 1 indicating a cell that is a starting point.

****输出格式：****

* Line 1: The sum of difficulty ratings of all starting points (note that this may not fit into a 32-bit integer, even though individual difficulty ratings will).

## **输入输出样例**

****输入样例#1：****

3 5 10

20 21 18 99 5

19 22 20 16 17

18 17 40 60 80

1 0 0 0 0

0 0 0 0 0

0 0 0 0 1

****输出样例#1：****

24

## **说明**

The ski course is described by a 3 x 5 grid of elevations. The upper-left and lower-right cells are designated as starting points. From each starting point, we must be able to reach at least 10 cells.

The difficulty rating of the upper-left starting point is 4, and for the lower-right it is 20.

3 slowdown

## **题目描述**

Bessie the cow is competing in a cross-country skiing event at the winter Moolympic games. She starts out at a speed of 1 meter per second. However, as she becomes more tired over time, she begins to slow down. Each time Bessie slows down, her speed decreases: she moves at 1/2 meter per second after slowing down once, then 1/3 meter per second after slowing down twice, and so on.

You are told when and where Bessie slows down, in terms of a series of events. An event like this:

T 17 means that Bessie slows down at a specific time -- here, 17 seconds into the race. An event like this:

D 10 means that Bessie slows down at a specific distance from the start -- in this case, 10 meters.

Given a list of N such events (1 <= N <= 10,000), please compute the amount of time, in seconds, for Bessie to travel an entire kilometer. Round your answer to the nearest integer second (0.5 rounds up to 1).

贝西正在参加一项滑雪比赛。她从起点出发的时候，速度恒定为每秒 1 米。然而，随着比赛进程的增加，她会犯很多错误，每次失误都会使她的速度下降。当她第一次失误后，速度会下降到每秒1/2 米，第二次失误后，速度会下降到每秒 1/3 米，第 k 次失误后，速度会下降到每秒 1/(k + 1) 米。

约翰记录了贝西的所有失误，一共有 N 个。有两种失误，一种发生在比赛开始后的某个时间点，另一种发生在赛道的某个位置上。有时，贝西可能在某个时间点到达某个位置，而恰好在这个时间点和位置上都有一次失误的记录，这两个记录要算作不同的失误，会对贝西的速度造成两次影响。比赛的终点距离起点有 1000 米，请问贝西需要多少时间才能滑过终点？

## **输入输出格式**

****输入格式：****

第一行：单个整数 N ，1 ≤ N ≤ 10000

第二行到第 N + 1 行：每行开头有个大写字母，代表贝西的一个失误类型：

– 如果是 T，接下来会有一个整数 S，表示在比赛开始后的第 S 秒钟整发生了一次失误，

1 ≤ S ≤ 10^7

– 如果是 D，接下来会有一个整数 X，表示在距离起点 X 米处发生了一次失误，1 ≤ X ≤

1000

****输出格式：****

单个整数：表示贝西需要多少秒才能滑到终点，如果精确的时间不是整数，则用四舍五入的方

法向最接近的整数取整

## **输入输出样例**

****输入样例#1：****

2

T 30

D 10

****输出样例#1：****

2970

## **说明**

前 10 秒，贝西的速度是每秒 1 米，她滑了 10 米。然后她遭遇了第一次失误，在接下

来的 20 秒内，她又滑了 10 米。之后她遭遇了第二次失误，还剩下 980 米，所以她共计花去

10 + 20 + 2940 = 2970 秒才完成比赛

4 recording

## **题目描述**

Being a fan of all cold-weather sports (especially those involving cows),

Farmer John wants to record as much of the upcoming winter Moolympics as

possible.

The television schedule for the Moolympics consists of N different programs

(1 <= N <= 150), each with a designated starting time and ending time. FJ

has a dual-tuner recorder that can record two programs simultaneously.

Please help him determine the maximum number of programs he can record in

total. 冬奥会的电视时刻表包含N (1 <= N <= 150)个节目，每个节目都有开始和结束时间。农民约翰有两台录像机，请计算他最多可以录制多少个节目。

## **输入输出格式**

****输入格式：****

Line 1: The integer N.

* Lines 2..1+N: Each line contains the start and end time of a single

program (integers in the range 0..1,000,000,000).

****输出格式：****

* Line 1: The maximum number of programs FJ can record.

## **输入输出样例**

****输入样例#1：****

6

0 3

6 7

3 10

1 5

2 8

1 9

****输出样例#1：****

4

## **说明**

INPUT DETAILS:

The Moolympics broadcast consists of 6 programs. The first runs from time

0 to time 3, and so on.

OUTPUT DETAILS:

FJ can record at most 4 programs. For example, he can record programs 1

and 3 back-to-back on the first tuner, and programs 2 and 4 on the second

tuner.