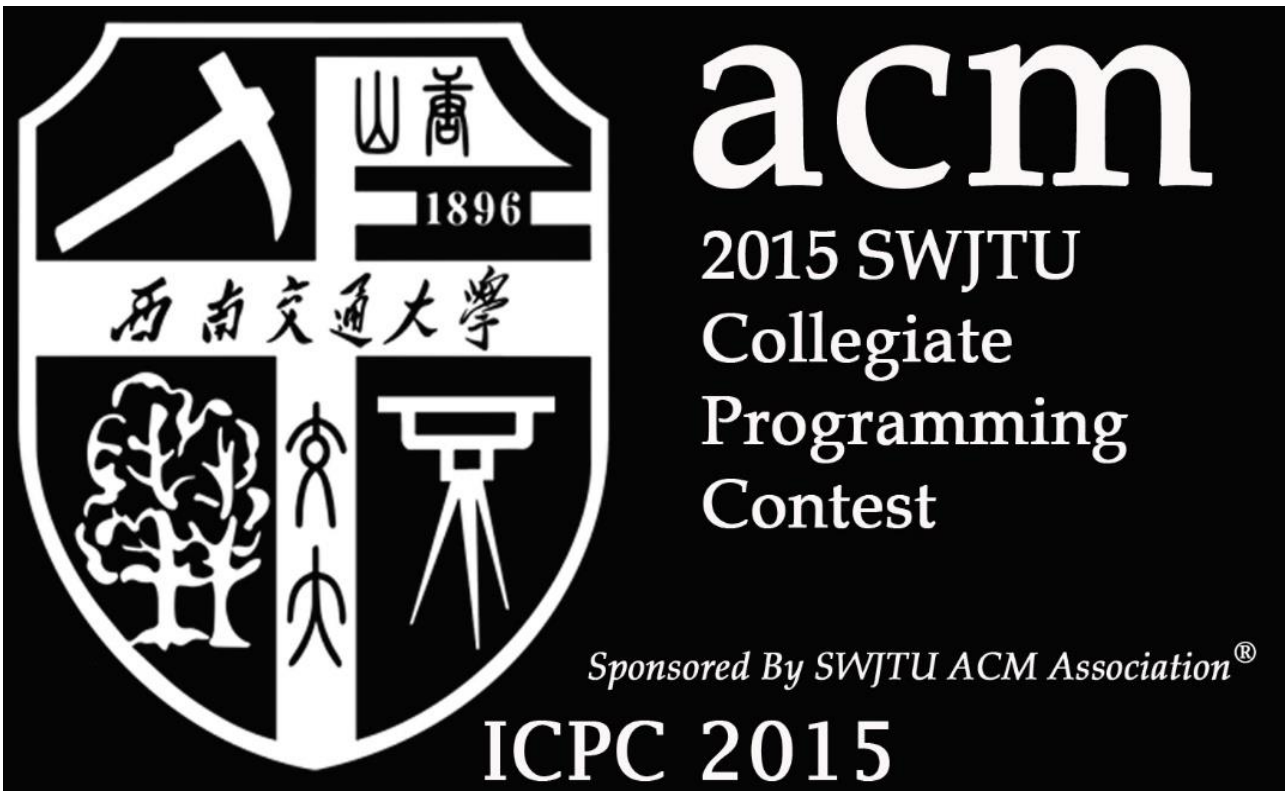
Contest - The 11th SWJTU Collegiate Programming Contest - Qualification Round

Round Ⅱ



2015.4.26

Content

Problem A	**Dull DongGua**
Problem B	**Search For The Treasures**
Problem C	**Magical DongGua**
Problem D	**How Many Possibilities**
Problem E	**Class Party**
Problem F	**Strange numbers**
Problem G	**Romantic DongGua**
Problem H	**A + B ≥ K Problem**
Problem I	**Smart DongGua**

Dull DongGua

Time Limit:1S Memory Limit:65536K

Description

With executing the new rule of swiping health cards in SWJTU, DongGua begin to love jogging. It looks like that he want to lose fat, but the truth is he want to counter more hot girls!
Whatis more, Dong gua is not satisfied with this system of swiping cards and he is going to writing to the president of SWJTU-XuHuiHui to change something.DongGua's idea is that: there are N points to swiping the card, and you should totally swiping $x_1, x_2, ..., x_N$ times in each point, and every adjacent swiping can not in the same point.
But president XuHuiHui dislike certain times of swiping cards,so that in every point the totally times of swiping cards is not the same. So XuHuiHui ask DongGua to make a machine to check whether the data in all the points is correct. But DongGua always talks with many beautiful girls in C++ class, and now he can't fabricate the machine. As a result, He want your help! Dear, please help him to make it!

Input

The first line of the input contains an integer $T(1 \le T \le 20)$ which means the number of test cases.
Each case follow two lines, the first line is a number N ,the next line consists $N(1 \le N \le 1,000,000)$ integers, $x_1, x_2, ..., x_N (1 \le x_i \le 1,000,000)$, represent N points you can swipe cards.

Output

For each test case, if the data if correct, please output "Yes", else please output "No".

Sample Input

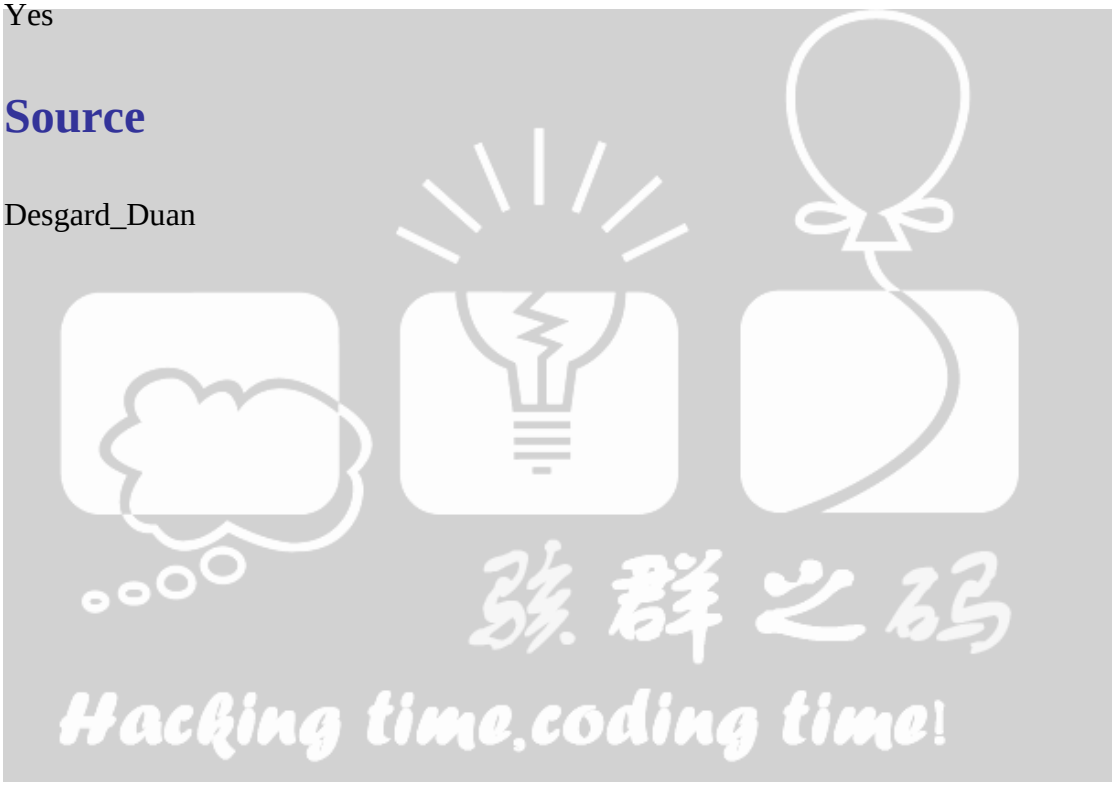
```
2
3
4 1 1
5
5 4 3 2 1
```

Sample Output

```
No
Yes
```

Source

Desgard_Duan



Search For The Treasures

Time Limit:1S Memory Limit:32768K

Description

Xiaoming want to get all treasures from the Maze,Can you tell him how much time he will spend if he gets all treasures and leave the maze as fast as he can.

Input

Multiply tests,First line provides two integers n,m,and next n lines,each line contains m integers to represents the maze,and -1 represents wall that he cannot cross, 0 represents road that he can cross,but if it is a positive integer and then it means a treasure (At most 15 treasures),he can get it and also can cross.
Xiaoming each time can move one step (Left,Right,Up,Down),and it will cost him one second.

He start from the location $(1,1)$ and finally he must return back to the location $(1,1)$.

please note that $1 \le n,m \le 100$.

Output

Output an integer means the least time xiaoming will spend if he get all treasures from the maze and leave from the maze.If he cannot reach his goal,output -1.

Sample Input

```
3 3
0 0 0
0 100 0
0 0 0
2 2
1 1
1 1
3 3
0 0 0
0 -1 -1
-1 3 -1
```

Sample Output

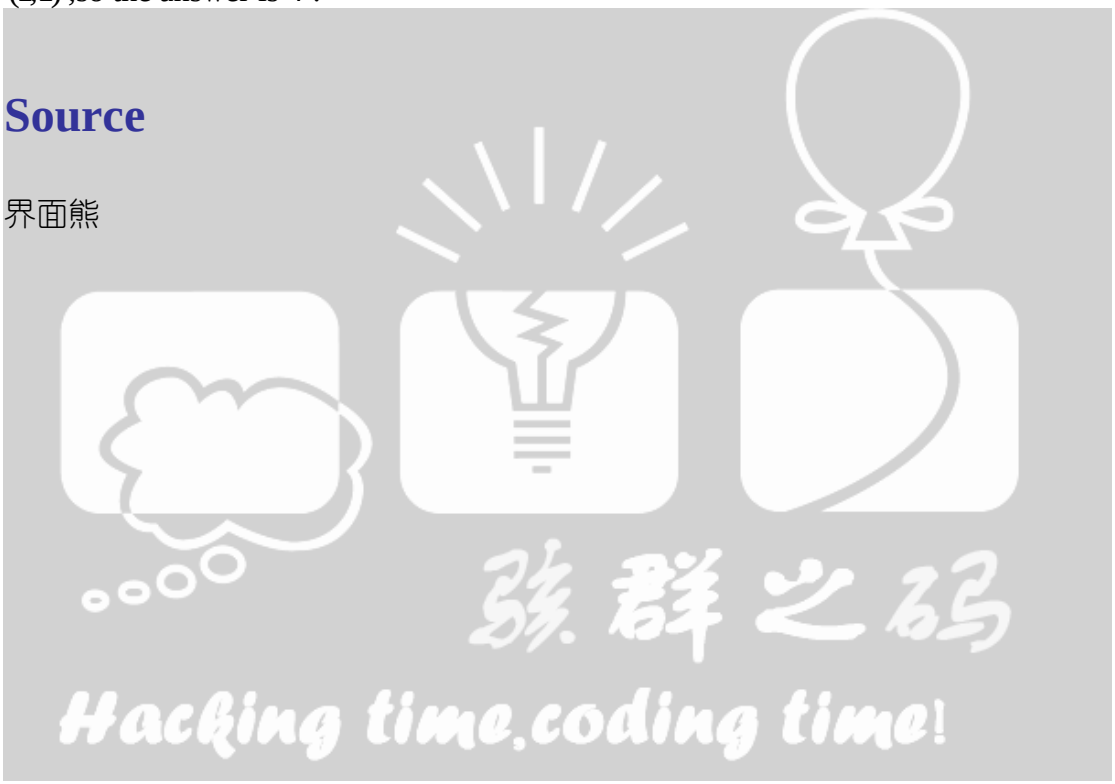
4
4
-1

Hint

For the first test case xiaoming’s one possible route is $(1,1) \rightarrow (1,2) \rightarrow (2,2) \rightarrow (1,2) \rightarrow (1,1)$,so the answer is 4 !

Source

界面熊



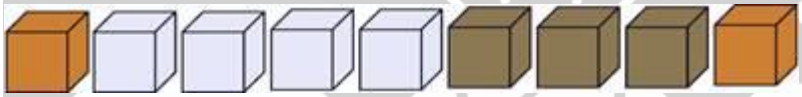
Magical DongGua

Time Limit:1S Memory Limit:65536K

Description

DongGua always don’t like playing games, because he thinks that many games are so simple.
This day, JM Bear was playing a game in his phone called ‘Blocks’, then they started battle. Rules of the game are as follows:
There are n blocks in a row, each box has a color. Here is an example: Gold, Silver, Silver, Silver, Silver, Bronze, Bronze, Bronze, Gold.

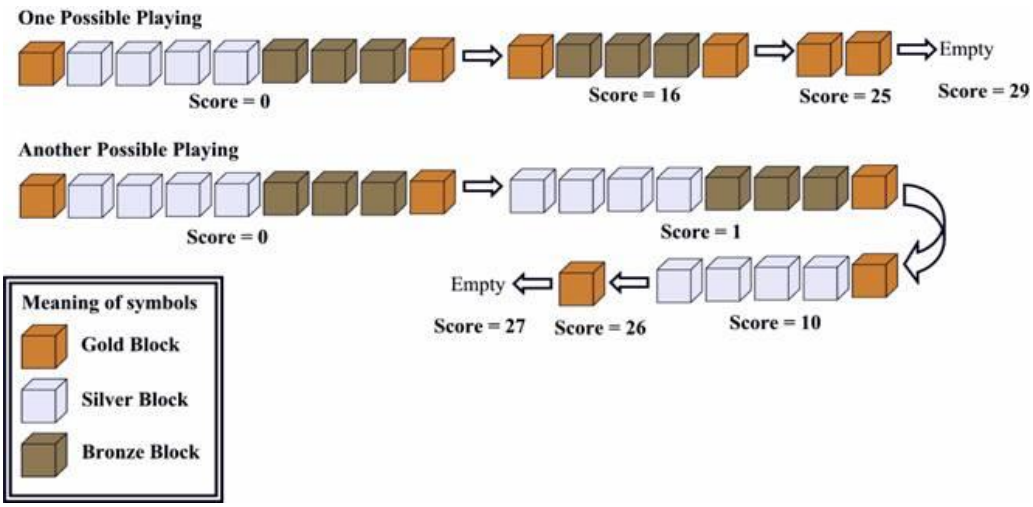
The corresponding picture will be as shown below:



If some adjacent boxes are all of the same color, and both the box to its left (if it exists) and its right (if it exists) are of some other color, we call it a 'box segment'. There are 4 box segments. That is: gold, silver, bronze, gold. There are 1, 4, 3, 1 box (es) in the segments respectively.

Every time, you can click a box, then the whole segment containing that box DISAPPEARS. If that segment is composed of k boxes, you will get k*k points. for example, if you click on a silver box, the silver segment disappears, you got $4\times4=16$ points.

Now let’s look at the picture below:



The first one is OPTIMAL.

DongGua could get the highest score in every times. Can you follow him?

Input

The first line contains the number of tests $t(1 \le t \le 15)$. Each case contains two lines.

The first line contains an integer $n(1 \le n \le 200)$, the number of boxes. The second line contains n integers, representing the colors of each box. The integers are in the range $1 \sim n$.

Output

For each test case, print the case number and the highest possible score.

Sample Input

```
2
9
1 2 2 2 2 3 3 3 1
1
1
```

Sample Output

Case 1: 29
Case 2: 1

Source

Desgard_Duan

How Many Possibilities

Time Limit:1S Memory Limit:65536K

Description

Xiaoming was given a long sequence of integers $A_1, A_2, ..., A_N$. For a given number C,

He wants to know how many 2-tuples (i, j) exists such that $i \neq j$ and $A_i + A_j = C$.

Please note that (i, j) is different from (j, i).

Input

The first line of the input contains an integer T which is the number of test cases, and T test cases follow.
For each test case, the first line contain an integer N. The second line contain N integers $A_1, A_2, ..., A_N$. The third line contain an integer Q which denotes the number of queries.

Then next Q lines, each line contain an integer C.

$(1 \le N \le 10^5; 0 \le A_1, A_2, ..., A_N \le 10^3; 1 \le Q \le 1000; 0 \le C \le 10^9)$

Output

For each query, print the result.

Sample Input

```
1
4
1 1 3 4
2
2
4
```

Sample Output

2
4

Source

界面熊

Class Party

Time Limit:1S Memory Limit:65536K

Description

There are n students in Xiao Ming's class .One day, Ming's teacher wants to hold a class party, and he need to notice all students. Xiao Ming's teacher has a telephone which have all telephone numbers of students in it. Also, all students have some telephone numbers of their classmates in their telephones, and Xiao Ming's teacher know who they are. When alerted, every student will tell every classmates in his cellphone about the party. Your task is to find the minimum students teacher needs to alert if he wants all students in his class know the party.

Input

The first line contain a number $n(1 \le n \le 2,000)$ which means there are n students in this class.

Then the next n lines contain some integer, which means the $i(1 \le i \le n)$ student's phone book.
The test data end up with zero.

Output

Output a integer about the minimum number teacher needs to alert.

Sample Input

```
4
2 3 0
0
0
0
0
```

Sample Output

2

Source

rabbit

Strange numbers

Time Limit:1S Memory Limit:65536K

Description

A number has n digits (no leading zeros), and each of its digits is odd, but to increase the difficulty of the problem ,I want 7, 9 in this number to appear even times. Can you count how many numbers will meet the conditions.

Input

First line is T represents test cases.
Next T lines, each line contains a integer n, it means numbers have n digits

$(1 \le n \le 10^{18}; 1 \le T \le 100)$

Output

Print how many numbers will meet the conditions. Answer may be very large, please out the answer mod $1,000,000,007$.

Sample Input

```
2
1
2
```


Sample Output

```
3
11
```

Hint

In the second case following 11 numbers meet the conditions.
They are 11,15,19,33,51,55,59,77,91,95,99.

Source

界面熊

Romantic DongGua

Time Limit:1S Memory Limit:65536K

Description

DongGua is a romantic guy. Because of lacking lighting in the night in SWJTU, he want to install some streetlights to decorate SWJTU.
From SiShiYangHua Wall to our library, N benches are lying on the road, there positions are X1,X2,.....,XN, these all need to be lighted.For each streetlight, the radius of lighting is R. DongGua have nothing to
pay, so he want to make cost the least. And now he need your help!

Input

Many cases will be inputted.For each case, the first line is an integer $N(1 \le N \le 1,000)$ represent the number of benches. The second line is an integer $R(1 \le R \le 1,000)$ means the radius of lighting. And the third line consists N numbers, $X_1, X_2, ..., X_N$, which are the positions of benches.

Output

For each case. Please output the least number of streetlights DongGua need to install.

Sample Input

```
3
0
10 20 20
10
7
70 30 1 7 15 20 50
```

Sample Output

2
4

Source

Desgard_Duan

A + B ≥ K Problem

Time Limit:1S Memory Limit:65536K

Description

This problem is so simple.
There is an array of integers of length N, and A, B are two numbers of this array. So please tell me the number of situation which make the inequality $A+B\geq K$ come into existence.

Input

The input contains several test cases.

In each case, there is two integers $N(0\leq N\leq 200,000)$, $K(0\leq K\leq 10^8)$ in the first line.

The second line contains N integers, $x_1,x_2,.....,x_N(0\leq x_i\leq 10^8)$, which are the elements of the array.

Output

For each case, please output one line which contains an integer X.
X is the number of situation which make the inequality $A+B\geq K$ come into existence.

Sample Input

4 7
1 2 3 4

Sample Output

1

Source

Rabbit

Smart DongGua

Time Limit:3S Memory Limit:65536K

Description

In this world, there is a dog which is so lonely. We always call it --- Single Dog. DongGua is the kind of the dog. So every night, he wanted to take a walk, but he always saw many Double Doges played (→_→) in lots of positions. He hoped to keep them away.
Hypothesis DongGua walked in a rectangle square(lower left corner of the rectangle is on the origin of the coordinate axes, we can get the point (X,Y) of the top right corner of the square). And the locations (X_i,Y_i) of Double Doges are known. Which point (P,Q) could make DongGua keep the furthest away from them.

Input

Input
The input consists of T test cases. The number of them (T) is given on the first line of the input file. Each test case begins with a line containing three integers X, Y, M separated by space. The numbers satisfy conditions: $1 \le X,Y \le 10,000$, $1 \le M \le 1,000$. The numbers X and Y indicate the dimensions of the square which has a rectangular shape. The number M stands for the number of Double Doges. Then exactly M lines follow, each containing two integer numbers X_i and $Y_i (0 \le U_i \le X, 0 \le V_i \le Y)$ indicating the positions of a group of Double Doge. There may be several Double Doges at the same position.

Output

Output
Print exactly one line for each test case. The line should contain the sentence "The furthest point is (P,Q)." where P and Q are the coordinates of the point in the square that has the maximum distance from the nearest Double Doges, rounded to the nearest number with exactly one digit after the decimal point (0.05 rounds up to 0.1).

Sample Input

```
3
1000 50 1
10 10
100 100 4
10 10
10 90
90 10
90 90
3000 3000 4
1200 85
63 2500
2700 2650
2990 100
```

Sample Output

```
1000.0, 50.0
50.0, 50.0
1433.0, 1669.8
```

Source

Desgard_Duan