A

Sobs Land

time limit per test : 3 seconds
memory limit per test : 256 megabytes

Again, there are hard times in Sobs Land! Many towns have such tensions that even civil war is possible.

There are n towns in Resobs Land, some pairs of which connected by two-way roads. It is not guaranteed that it is possible to reach one town from any other town using these roads.

Towns s and t announce the final break of any relationship and intend to rule out the possibility of moving between them by the roads. Now possibly it is needed to close several roads so that moving from s to t using roads becomes impossible. Each town agrees to spend money on closing no more than one road, therefore, the total number of closed roads will be **no more than two.**

Help them find set of no more than two roads such that there will be no way between s and t after closing these roads. For each road the budget required for its closure was estimated. Among all sets find such that the total budget for the closure of a set of roads is minimum.

Input Format

The first line of the input contains two integers n and m $(2 \le n \le 1000,\ 0 \le m \le 30000)$ — the number of towns in Berland and the number of roads.

The second line contains integers s and t $(1 \le s,\ t \le\ n, s\ \ne t)$ - indices of towns which break up the relationships.

Then follow m lines, each of them contains three integers x_i, y_i and w_i $(1 \le x_i,\ y_i \le\ n,\ 1 \le w_i \le 10^9)$ – indices of towns connected by the i^{th} road, and the budget on its closure.

All roads are bidirectional. It is allowed that the pair of towns is connected by more than one road. Roads that connect the city to itself are allowed.

Output Format

In the first line print the minimum budget required to break up the relations between s and t, if it is allowed to close no more than two roads.

In the second line print the value c $(0 \le c \le 2)$ — the number of roads to be closed in the found solution.

In the third line print in any order c diverse integers from 1 to m — indices of closed roads. Consider that the roads are numbered from 1 to m in the order they appear in the input.

If it is impossible to make towns s and t disconnected by removing no more than 2 roads, the output should contain a single line **-1**.

If there are several possible answers, you may print any of them.

Sample 1:

Input	output
6 7 1 6 2 1 6 2 3 5 3 4 9 4 6 4 4 6 5 4 5 1 3 1 3	8 2 2 7

B

Card Memorization

time limit per test : 3.5 seconds
memory limit per test : 256 megabytes

Polka has just won a maths competition in Novou! The prize is admirable — a great book called 'Card Tricks for Everyone.' 'Great!' he thought, 'I can finally use this old, dusted deck of cards that's always been lying unused on my desk!'

The first chapter of the book is 'How to Shuffle k Cards in Any Order You Want.' It's basically a list of n intricate methods of shuffling the deck of k cards in a deterministic way. Specifically, the i-th recipe can be described as a permutation $(Pi,1,Pi,2,\ldots,Pi,k)$ of integers from 1 to k. If we enumerate the cards in the deck from 1 to k from top to bottom, then Pi,j indicates the number of the j-th card from the top of the deck after the shuffle.
The day is short and Polka wants to learn only some of the tricks today. He will pick two integers l,r ($1 \le l \le r \le n$), and he will memorize each trick from the l-th to the r-th, inclusive. He will then take a sorted deck of k cards and repeatedly apply random memorized tricks until he gets bored. He still likes maths, so he started wondering: how many different decks can he have after he stops shuffling it?

Polka still didn't choose the integers l and r, but he is still curious. Therefore, he defined $f(l,r)$ as the number of different decks he can get if he memorizes all the tricks between the l-th and the r-th, inclusive. What is the value of

$$\sum l=1n\sum r=lnf\ (l,r)?$$

Input Format

The first line contains two integers n and k $(1 \le n \le 200000,\ 1 \le k \le 5)$ – the number of towns in *Novou* and the number of roads.

Each of the following n lines describes a single trick and is described by k distinct integers $P_{i,1}, P_{i,2}, \ldots, P_{i,k}$ $(1 \le P_{i,j} \le k)$.

Output Format

Output the value of the sum described in the statement.

Sample 1:

Input	output
3 3 2 1 3 3 1 2 1 3 2	25

C

Sale Shovel

time limit per test : 1 second
memory limit per test : 256 megabytes

David owns a shop with n shovels, where the i-th shovel is priced at i burles. For example, the first shovel costs 1 burle, the second costs 2 burles, the third costs 3 burles, and so on up to n burles.

David has noticed that visitors are particularly drawn to pairs of shovels whose combined price ends with a sequence of nines. To maximize his sales, David wants to identify all possible pairs of shovels where the sum of their costs ends with the greatest number of consecutive nines.

Your task is to help David by determining the number of such pairs.

Input Format

The first line contains the t $(1 \le t \le 100)$ number of test cases.
Each test case contains a number n $(1 \le n \le 10^9)$.

Output Format

Print the number of pairs of shovels such that their total cost ends with the maximum possible number of nines.

Note that it is possible that the largest number of 9s at the end is 0, so you should count all such ways.

Sample 1:

Input	output
3 7 14 50	3 9 1

Note:
In the first example the maximum possible number of nines at the end is one.
David can choose the following pairs of shovels for that purpose:

- 2 and 7
- 3 and 6
- 4 and 5

D

The King's Puzzle: The Search for the Perfect Sum

time limit per test : 1 second
memory limit per test : 256 megabytes

In the kingdom of Numerica, King Tony, known for his love of numbers, presented a challenge to his subjects. The challenge was simple yet intriguing:

Given the number **N**," the King declared, "I want to know if a sequence of the first **N** consecutive numbers, starting from 1, whose sum is exactly **N, exists**. For example, if **N** is 6, the sum of the first 3 numbers (1 + 2 + 3) equals 6, so the answer is **YES**. But what about other numbers? Can you determine whether such a sequence exists for any **N**?

The task was clear: find out if there is a sequence of consecutive numbers starting from 1 that sums up to **N**. If such a sequence exists, the answer is **YES**; if not, it's **NO**. The King awaited the solution, knowing that those who succeeded would gain his favor and admiration.

Will you take on the King's puzzle and find the answer?

Input Format

The first line contains the t $(1 \leq t \leq 100)$ number of test cases.
Each test case contains a number n $(1 \leq n \leq 10^{18})$.

Output Format

output "yes" if exists else "no" case sensitive without quotes

Sample 1:

Input	output
2 6 7	yes no

2

Dev Virus

time limit per test : 1 seconds
memory limit per test : 256 megabytes

A new agent called Phoenix invented a virus DEVDEAD-42609 that infects accounts on Devsinc. Each account has a rating, described by **an integer** (it can possibly be negative or very large).

Phoenix's account is already infected and has a rating equal to x. Its rating is constant. There are n accounts except hers, numbered from 1 to n. The i-th account's initial rating is ai. Any infected account (initially the only infected account is Phoenix's) instantly infects any uninfected account if their ratings are equal. This can happen at the beginning (before any rating changes) and after each contest. If an account is infected, it can not be healed.

Contests are regularly held on Devsinc. In each contest, any of these n accounts (including infected ones) can participate. Phoenix can't participate. After each contest ratings are changed this way: each participant's rating is changed by an integer, but the sum of all changes must be equal to zero. New ratings can be any integer.

Find out the minimal number of contests needed to infect all accounts. You can choose which accounts will participate in each contest and how the ratings will change.

It can be proven that all accounts can be infected in some finite number of contests.

Input Format

The first line contains a single integer t $(1 \leq t \leq 100)$ — the number of test cases. The next $2t$ lines contain the descriptions of all test cases.

The first line of each test case contains two integers n and x $(2 \leq n \leq 10^3, -4000 \leq x \leq 4000)$ -- the number of accounts on Devsinc and the rating of Phoenix's account.

The second line of each test case contains n integers $a1$, $a2$, ..., an $(-4000 \leq a_i \leq 4000)$ — the ratings of other accounts.

Output Format

For each test case output the minimal number of contests needed to infect all accounts.

Sample 1:

Input	output
3 2 69 68 70 6 4 4 4 4 4 4 4 9 38 -21 83 50 -59 -77 15 -71 -78 20	1 0 2

Note

In the first test case it's possible to make all ratings equal to 69. First account's rating will increase by 1, and second account's rating will decrease by 1, so the sum of all changes will be equal to zero.

In the second test case all accounts will be instantly infected, because all ratings (including Phoenix's account's rating) are equal to 4.

-78
38
40

19 43 50 10

-1 0

8 -77 -78
+77 0

→ 24 26
→ 83 77
→ 56 59 15
→ 78 71

Devsinc Flood

F

time limit per test : 1 seconds
memory limit per test : 256 megabytes

You are given a line of n colored squares in a row, numbered from 1 to n from left to right. The i-th square initially has the color ci.

Let's say, that two squares i and j belong to the same connected component if $c_i = c_j$, and $c_i = c_k$ for all k satisfying $i < k < j$. In other words, all squares on the segment from i to j should have the same color.
For example, the line [3,3,3] has 1 connected component, while the line [5,2,4,4] has 3 connected components.

The game "devsinc flood" is played on the given line as follows:

- At the start of the game you pick any starting square (this is not counted as a turn).
- Then, in each game turn, change the color of the connected component containing the starting,square to any other color.

Find the minimum number of turns needed for the entire line to be changed into a single color.

Input Format

The first line contains a single integer n $(1 \leq n \leq 5000)$ - the number of squares.
The second line contains integers $c_1, c_2, \ldots, c_n$ $(1 \leq c_i \leq 5000)$ - the initial colors of the squares.

Output Format

Print a single integer — the minimum number of the turns needed.

Sample 1:

Input	output
4 5 2 2 1	2

Note:
In the first example, a possible way to achieve an optimal answer is to pick square with index 2 as the starting square and then play as follows:

- [5,2,2,1]
- [5,5,5,1]
- [1,1,1,1]