Problem A Non-boring sequences

We were afraid of making this problem statement too boring, so we decided to keep it short.

A sequence is called **non-boring** if its every connected subsequence contains a unique element, i.e. an element such that no other element of that subsequence has the same value.

Given a sequence of integers, decide whether it is **non-boring**.

Input

The first line of the input contains the number of test cases T. The descriptions of the test cases follow:

Each test case starts with an integer n ($1 \leqslant n \leqslant 200\,000$) denoting the length of the sequence. In the next line the n elements of the sequence follow, separated with single spaces. The elements are non-negative integers less than 10^9.

Output

Print the answers to the test cases in the order in which they appear in the input. For each test case print a single line containing the word **non-boring** or **boring**.

Example

Input	Output
4 5 1 2 3 4 5 5 1 1 1 1 1 5 1 2 3 2 1 5 1 1 2 1 1	non-boring boring non-boring boring

Problem B Chain & Co.

Chain & Co. specializes in producing infinitely strong chains. Because of their high quality products, they are quickly gaining market share. This leads to new challenges, some of which they could have never imagined before. Like, for example, automatic verification of link endurance with a computer program, which you are supposed to write.

The company produces *links* of equal size. Each link is an infinitely thin square frame in three dimensions (made of four infinitely thin segments).

During tests all links are axis-aligned [1] and placed so that no two frames touch. To make a proper strength test, two sets of links A and B are forged so that every link of A is inseparable from every link of B (being inseparable means that they cannot be moved apart without breaking one of them).

You stumble upon some links (axis-aligned, pairwise disjoint). Are they in proper testing position? In other words, can they be divided into two non-empty sets A and B with the desired property?

Input

The first line of input contains the number of test cases T. The descriptions of the test cases follow:

The description of each test case starts with an empty line. The next line contains an integer n, $1 \leqslant n \leqslant 10^6$ – the number of links in the chain. Each of the next n lines contains 6 space-separated integers $x_i, y_i, z_i, x'_i, y'_i, z'_i$, all between -10^9 and 10^9 – the coordinates of two opposite corners of the i-th link.

Output

For each test case, print a single line containing the word **YES** if the set is in proper testing position, or **NO** otherwise.

[1] Axis-aligned means that all segments are parallel to either X, Y, or Z axis.

Example

For an example input	the correct answer is:
3 2 0 0 0 0 10 10 -5 5 15 5 5 25 5 0 0 0 0 10 10 -5 5 6 5 5 16 -5 5 -6 5 5 4 -5 6 5 5 16 5 -5 -6 5 5 4 5 3 0 0 0 3 0 -3 1 -1 -1 1 2 -4 -1 -2 -2 2 1 -2	NO YES YES

Problem C Escape

You hit the emperor lich with full force and slay it. There is a stair leading upwards here. You climb upstairs. You drink from the pool. You feel much better. The karmic lizard punches through your armor and hits you. You die...

After an epic fight with the emperor lich, the hero struggles to escape the dungeon consisting of n chambers and $n-1$ corridors connecting them. He starts in chamber number 1 and must reach chamber number t, moving only along the corridors. All chambers are reachable from chamber number 1. Bruised after the last fight, the hero starts the journey with 0 hit-points (HP). These points represent his health – if ever they fall below zero, the hero's story ends there as a tragic one.

In some chambers there are monsters – a monster must be fought, and it always manages to take some of the hero's HP. In some other chambers there are magic pools – every pool restores some number of the hit-points. There is no upper limit on the hero's health. Every chamber can be visited multiple times, but the gain or loss of HP happens only once, on the very first visit.

Determine whether the hero can escape the dungeon alive.

Input

The first line of input contains the number of test cases T. The descriptions of the test cases follow:

The first line of each test case contains two integers: the number of chambers n, $2 \leqslant n \leqslant 200\,000$, and the number of the exit chamber t, $2 \leqslant t \leqslant n$. The second line contains n space-separated integers between -10^6 and 10^6 – the i-th of them denotes the HP gain in the i-th chamber (negative denotes a monster, positive – a pool, and zero means that the chamber is empty). The first chamber does not contain a monster, but a pool is possible there. The exit chamber may contain a pool or a monster, and the monster will have to be fought before escaping.

The next $n-1$ lines contain the descriptions of corridors. Each one contains a pair of integers – the ends of a corridor.

Output

For each test case print a single line containing the word **escaped** if escape is possible, or **trapped** otherwise.

Example

For an example input	the correct answer is:
2 7 7 0 -3 2 2 3 -4 0 1 2 2 3 2 4 1 5 5 6 6 7 3 2 3 3 -4 1 3 2 3	escaped trapped

D Divisible Numbers

time limit per test: 3.5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given an array A of integers of size N, and Q queries. For each query, you will be given a set of distinct integers S and two integers L and R that represent a range in the array. Your task is to count how many numbers in the given range are divisible by at least one number from the set.

Input

The first line of input contains a single integer T, the number of test cases.

The first line of each test case contains two integers, N and Q ($1 \leq N, Q \leq 10^5$), the size of the array and the number of queries, respectively.

The next line contains N space-separated integers, the values of the array A ($1 \leq A_i \leq 10^9$).

Each of the next Q lines contain the description of one query in the form:

LRS

Where L and R ($1 \leq L \leq R \leq N$) represent the range, and S is an integer between 1 and 1023 (inclusive) and represents the set; consider the binary representation of the number S, if the i^{th} bit (1-based) is 1, then the number i belongs to the set. Since S is less than 1024, the values in the set are between 1 and 10.

For example: if S is equal to 6, the binary representation of 6 is 110, and this means the values in the set are 2 and 3.

The input was given in this way to reduce the size of the input file.

Output

Print the answer for each query on a single line.

Example

input
1 4 2 2 5 3 8 1 3 2 2 4 355
output
1 3