Problem 1008. Fight and upgrade

You lead an army to fight monsters in a world where the blood of monsters is composed of physical blood hp_p and magical blood hp_m.

Your army has n soldiers, the i-th soldier has k_i attack methods, and the j-th attack method of the ith soldier causes p_{ij} points of physical damage and m_{ij} points of magic damage to the monster.

The total attack power of an army is the sum of the attack power of each soldier, and the attack power of each soldier is a weakly normalized linear combination of all attack methods of this soldier, i.e., the coefficients sum of the linear combination is less than or equal to 1. Formally, if the physical damage caused by a total attack of the army is $hurt_p$ and the magic damage is $hurt_m$, then

$$hurt_p = \sum_{i=1}^{n} \sum_{j=1}^{k_i} c_{ij} * p_{ij}$$

$$hurt_m = \sum_{i=1}^{n} \sum_{j=1}^{k_i} c_{ij} * m_{ij}$$

where c_{ij} is the weight assigned by the i-th soldier to the j-th attack, satisfying: $\forall i : \sum_{j=1}^{k_i} c_{ij} \leq 1$, $\forall c_{ij} \geq 0$.

Since you're competitive, you want to know if you can kill the monster in just 1 attack. After your army fights the r-th monster, whether or not it can be killed by your army in a single attack, it will drop an attack method that will be gained by the s_r-th soldier.

During the expedition, you will encounter q monsters in turn. For the r-th monster, it has five attributes $hp_{pr}, hp_{mr}, p_r, m_r, s_r$, which indicate the physical blood, magic blood, the physical damage and magic damage of the new attack method, the number of the soldier who gained the attack method after the battle.

To defeat a monster, you need to find an attack combination that makes the monster's physical and magic HP **exactly 0.**

Input

The input consists of multiple test cases.

The first line contains an integer T $(T = 11)$ – the number of test cases.

For each test case:

The first line contains two positive integers $n, q (1 \leq n \leq 10^3, 1 \leq q \leq 10^5)$, which indicates the number of soldiers and the total number of monsters.

The next $3 * n$ rows describe the attacks of n soldiers. The $3 * i - 2$ to $3 * i$ rows describe the original attack of the i-th soldier: first an integer $k_i (1 \leq k_i \leq 10^5)$ indicating the number of attack methods of this soldier; the next k_i non-negative integer $p_{ij} (0 \leq p_{ij} \leq 10^6)$ indicating the physical damage of the j attack of the i soldier; the next k_i non-negative integer $m_{ij} (0 \leq m_{ij} \leq 10^6)$ indicating the magic damage of the j attack of the i soldier.

The next q rows, each containing five integers $hp_{pr}, hp_{mr}, p_r, m_r, s_r (0 \leq hp_p, hp_m \leq 10^9, 1 \leq s_r \leq n, 0 \leq p_r, m_r \leq 10^6,)$, indicate the *physical blood*, *magic blood* of the r-th monster, the *physical damage* of the new attack and the *magic damage* of the new attack, the *soldier number* that gained this attack method.

For a single test case, it is guaranteed that $\sum_{i=1}^{n} k_i \leq 10^5$.

Output

For each test case, output q rows containing YES or NO, indicating whether the monster can be defeated in 1 attack.

Example Input

```
2
2 3
1
1
0
1
1
0
1 1 0 1 1
1 1 0 1 2
0 2 1 1 1
2 2
3
13 11 4
11 0 9
3
4 16 4
4 16 11
20 26 15 19 2
20 26 1 1 1
```

Example Output

```
NO
YES
YES
NO
YES
```