COVID-21 Variant

COVID-19 virus has mutated again. The new variant seems to posses novel behavior.

1. Spreading
   - COVID-19 spreads from person to person in the same way.
   - COVID-21 spread is dependent on the age.

2. Distance (all values are given in meters)
   - COVID-19 can jump D_1 from any person to another person.
   - COVID-21 can jump D_2 from/to an older person or D_3 from a younger person.

$$D_2 \geq D_3$$

   This is because the older people are weak so they can catch the virus FROM a further person and their immunity systems cannot fight the virus so it will spread TO far away people.

3. Total spread
   - COVID-19 can spread for as long as there are people to spread to.
   - COVID-21 can spread only up to D_4 jump length between people.

Consider a situation where people are inside a room. The surveillance system is monitoring the human interactions and records all the close contacts where a disease spread is possible. Unfortunately, the time stamps of these records are lost.

Given these records, can you find if there is at least one person who if sick will spread the disease to the entire room?

Input Format

The first line contains the number of testcases T.

The second line contains four integers, D_1, D_2, D_3, D_4.

The third line contains two integers P (the number of people) and N (the number of interactions).

Next P lines contains a string A_i denoting the age of the person (OLD or $YOUNG$).

Next N lines contains three integer and a string p_{j0}, p_{j1} (the two people interacting) and D_j (the distance between the people during the interaction).

Constraints

$0 < T \geq 20$

$0 < N \geq 25000$

$0 < P \geq 100100$

$0 < D_1, D_2, D_3 \geq 100$

$$0 < D_4 \geq 10e7$$

$$0 < D_j \geq 250$$

Output Format

Print T lines, one lines for each testcase.

The line should contain YES or NO twice denoting 1. Whether COVID-19 will spread to the whole room. 2. Whetehr COVID-21 will spread to the whole room.

Sample Input 0

```
4
5 5 2 10
4 4
YOUNG
YOUNG
OLD
YOUNG
0 1 2
0 2 2
0 3 5
2 3 5
2 5 2 10
4 4
YOUNG
YOUNG
OLD
YOUNG
0 1 2
0 2 2
0 3 5
2 3 5
5 5 2 10
4 4
YOUNG
YOUNG
YOUNG
YOUNG
0 1 2
0 2 2
0 3 5
2 3 5
5 5 2 8
4 4
YOUNG
YOUNG
OLD
YOUNG
0 1 2
0 2 2
0 3 5
2 3 5
```
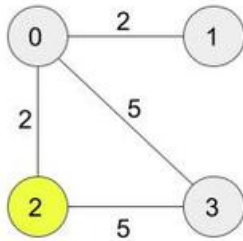
Sample Output 0

```
YES YES
NO YES
YES NO
YES NO
```

Explanation 0

Testcase 1

YOUNG OLD

Input

COVID-19 spread

$D_1=5$ YES

The virus can spread to everyone even if one person is sick because it can jump 5m max.

COVID-21 spread
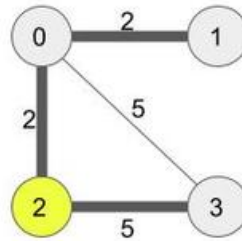
$D_2=5$ $D_3=2$ $D_4=10$ YES

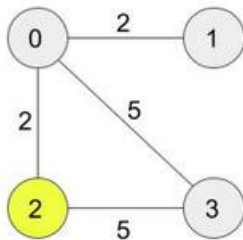The virus can jump 2m between younger people and 5m between others (2 and 3). The total jumps is 9, which is less than 10.
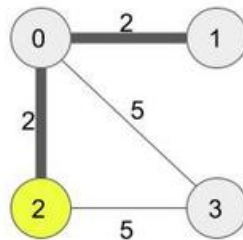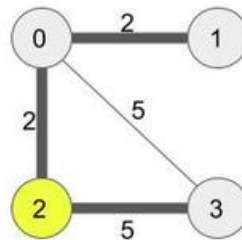
Testcase 2

YOUNG OLD

Input

COVID-19 spread

$D_1=2$ NO

If only 3rd person was sick initially, the virus won't spread to anyone because **it cannot jump 5m.**

COVID-21 spread

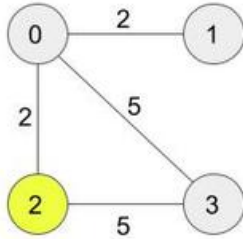$D_2=5$ $D_3=2$ $D_4=10$ YES

The virus can jump 2m between younger people and 5m between others (2 and 3). The total jumps is 9, which is less than 10.
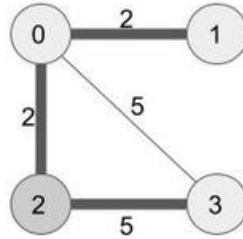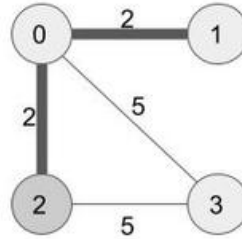
YOUNG   OLD   **Testcase 3**

Input

COVID-19 spread

COVID-21 spread

$D_1=5$ YES

The virus can spread to everyone even if one person is sick because it can jump 5m max.
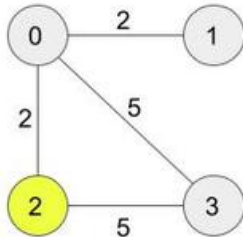
$D_2=5$ $D_3=2$ $D_4=10$ NO

If 1st person was sick, 0,1,2 will get sick. **But the virus cannot jump 5m to the 3rd person**

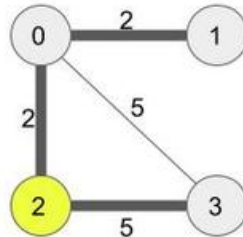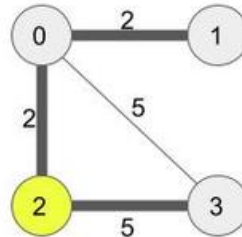YOUNG   OLD   **Testcase 1**

Input

COVID-19 spread

COVID-21 spread

$D_1=5$ YES

The virus can spread to everyone even if one person is sick because it can jump 5m max.

$D_2=5$ $D_3=2$ $D_4=8$ NO

The virus can jump 2m between younger people and 5m between others (2 and 3). **But the toal jumps, 9m is more than the total spread possible 8m.**