

Hello World!

Information

| Time Limit | Memory Limit | Data Amount | Problem Type |
|------------|--------------|-------------|--------------|
| 2000ms | 128MiB | 1 | Tradition |

Description

Welcome to DSAA 2022 Spring!

Input

There is no input for this problem.

Output

You should print "Hello World!" (without quotes)

Sample Test Data

```
<|==|>
Hello world!
```

Tips

Data Limit

Attention

A+B problem I

Information

| Time Limit | Memory Limit | Data Amount | Problem Type |
|------------|--------------|-------------|--------------|
| 1000ms | 128MiB | 10 | Tradition |

Description

Peter didn't want to upset you on your first assignment, so he gave you a easy problem.

Peter gives you a list of numbers with size n and a number C , and he want to know the number of pairs (A, B) that satisfy $A + B = C$ (two pairs are different if and only if their positions in the list are different).

Input

The first line contains two integers n, C .

The second line contain n integers a_1, \dots, a_n , representing the list of numbers.

Output

Only one integer, representing the number of pairs (A, B) that satisfy $A + B = C$.

Sample Test Data

```
5 4
1 2 2 3 3
<|==|>
3
```

Tips

In this sample, all the pairs are $(2, 2), (1, 3), (1, 3)$.

Data Limit

For 60% cases: $1 \leq n \leq 2000$

For 100% cases: $1 \leq n \leq 200000, 1 \leq C, a_1, \dots, a_n \leq 10^9$.

Attention

Birthday

Information

| Time Limit | Memory Limit | Data Amount | Problem Type |
|------------|--------------|-------------|--------------|
| 2000ms | 128MiB | 10 | Tradition |

Description

Peter wants to know the birthdays of each student in the DSAA course and sort them in order of age from oldest to youngest. But Peter is busy preparing his DSAA lessons and has no time, so please help him sort it.

Input

The first line contains one integer n .

The next n lines contain each student's name string s , birthday year y , month m and day d .

It's guaranteed that no student has two or more different birthdays.

Output

There are n lines on the output.

After sort all student, print their names on each line in order.

(If two students have the same birthday, the student who is input first will be output first)

Sample Test Data

```
3
tiansuo 1919 8 10
peter 2003 10 13
bob 2001 8 1
<|==|>
tiansuo
bob
peter
```

Tips

Data Limit

For 100% cases:

$1 \leq n \leq 100$, $-10^9 \leq y \leq 10^9$, $1 \leq m \leq 12$, $1 \leq d \leq 30$, $length(s) \leq 20$, s only contains lowercase letters.

Attention

A+B problem II

Information

| Time Limit | Memory Limit | Data Amount | Problem Type |
|------------|--------------|-------------|--------------|
| 2000ms | 128MiB | 10 | Tradition |

Description

Peter thinks your brain has been upgraded, so he has a slightly more challenging problem.

You are given n integers a_1, \dots, a_n . Find whether there are four distinct numbers A, B, C, D such that $A + B = C + D$ or not.

Input

The input consists of T test cases. The number of test cases T is given in the first line.

For each test cases:

The first line contains one integer n .

The second line contain n integers a_1, \dots, a_n , representing the list of numbers.

It's guaranteed that all a_i is distinct.

Output

If there are four distinct numbers A, B, C, D such that $A + B = C + D$, print "YES" (without quotes), otherwise print "NO" (without quotes).

Sample Test Data

```
2
5
4 7 5 6 10
4
1 3 4 5
<|==|>
YES
NO
```

Tips

In the first sample, we can find that $4 + 7 = 5 + 6$.

Data Limit

For 30% cases: $1 \leq n \leq 100$

For 60% cases: $1 \leq n \leq 2000$

For 100% cases: $1 \leq n \leq 200000, 1 \leq a_i \leq 10^6, 1 \leq T \leq 10$.

Each test case satisfy $\sum n \leq 10^6$.

Attention

Simple game

Information

| Time Limit | Memory Limit | Data Amount | Problem Type |
|------------|--------------|-------------|--------------|
| 2000ms | 128MiB | 10 | Tradition |

Description

Alice and Bob want to play a game. The rules are as follows:

There are n stones at first. Alice goes first. In each turn, the player can remove p^k stones from these stones, where p is a prime number and k is a non-negative integer. If the stones are all removed during someone's turn, he lose this game.

Now they are going to play t turns. For each turn, they want you to predict who will win if they use optimal operation.

Input

The first line contains one integer t .

For the next t lines, each line contain one integer n .

Output

There are t lines on the output.

For each turn, print out who will win.

Sample Test Data

```
3
3
6
15
<|==|>
Alice
Bob
Alice
```

```
3
100
101
102
<|==|>
Alice
Alice
Bob
```

Tips

During the first turn, Alice can remove all 3^1 stones.

During the second turn, no matter how many stones Alice removes, Bob can remove all the remaining stones.

It can be proved that in the third round Alice can win by optimal operations.

Data Limit

For 30% cases: $t = 1, 1 \leq n \leq 50$.

For 60% cases: $t = 1, 1 \leq n \leq 1000$.

For 100% cases: $1 \leq t \leq 10^5, 1 \leq n \leq 10^9$.

Attention

Elegant song

Information

| Time Limit | Memory Limit | Data Amount | Problem Type |
|------------|--------------|-------------|--------------|
| 2000ms | 128MiB | 10 | Tradition |

Description

Peter wrote a very long song. The tones of this song can be represented as an array a_i with n integers. However, MX found the song inelegant. He felt that for an elegant song, all the tones should be in the range $[l1, r1] \cup [l2, r2]$. Now Peter can raise or lower the tone of the song. In other words, he can plus or minus a fixed number into all integers of the array. Peter want to know if his songs could be elegant as MX think.

Input

The input consists of T test cases. The number of test cases T is given in the first line.

For each test cases:

The first line contains one integer n .

The second line contains four integers $l1, r1, l2, r2$.

The next line contains n integers a_1, \dots, a_n .

Output

If there is a solution , print "YES" (without quotes), otherwise print "NO" (without quotes).

Sample Test Data

```
2
5
1 2 5 8
3 4 7 8 9
5
1 2 4 5
3 4 7 8 9
<|==|>
YES
No
```

####

Tips

In the first case, we can add -2 to all a_i , make them become 1 2 5 6 7.

Data Limit

For 30% cases: $1 \leq n \leq 50$.

For 60% cases: $1 \leq n \leq 1000$.

For 100% cases:

$1 \leq n \leq 10^6, -10^9 \leq a_i, l1, r1, l2, r2 \leq 10^9, l1 \leq r1 < l2 \leq r2, 1 \leq t \leq 10$.

Each test case satisfy $\sum n \leq 10^6$.

Attention

The input can be huge, and you can reduce input time by using fast input.

C++ fast input:

```
int read(int x = 0, int f = 1, char ch = getchar()) {
    while(ch < '0' || ch > '9') {
        if(ch == '-') f = -1;
        ch = getchar();
    }
    while(ch >= '0' && ch <= '9') x = x * 10 + ch - '0', ch = getchar();
    return x * f;
}
//in main
int main() {
    int a;
    a = read();
}
```

Java fast I/O: <https://paste.ubuntu.com/p/6ybMcVXvz5/>