CODEFORCES
Sponsored by TON

HOME   TOP   CATALOG   CONTESTS   GYM   PROBLEMSET   GROUPS   RATING   EDU   API   CALENDAR   HELP

PROBLEMS   SUBMIT CODE   MY SUBMISSIONS   STATUS   HACKS   STANDINGS   CUSTOM INVOCATION

H. GCD is Greater

time limit per test: 3 seconds
memory limit per test: 512 megabytes
input: standard input
output: standard output

In the evenings during the hike, Kirill and Anton decided to take out an array of integers a of length n from their backpack and play a game with it. The rules are as follows:

1. Kirill chooses from 2 to $(n-2)$ numbers and encircles them in red.
2. Anton encircles all the remaining numbers in blue.
3. Kirill calculates the **greatest common divisor** (GCD) of all the red numbers.
4. Anton calculates the **bitwise AND** of all the blue numbers and adds the number x to the result.
5. If the GCD of all the red numbers is strictly greater than the sum of the bitwise AND of all the blue numbers and the number x, then Kirill wins; otherwise, Anton wins.

Help Kirill to beat Anton or tell if it's impossible.

Input

Each test consists of multiple test cases. The first line contains a single integer t ($1 \le t \le 20\,000$) — the number of test cases. Then follows the description of the test cases.

The first line of each test case contains two integers n and x ($4 \le n \le 4 \cdot 10^5$, $0 \le x \le 4 \cdot 10^5$) — the number of integers and the number x respectively.

The second line contains an array a of length n ($1 \le a_i \le 4 \cdot 10^5$).

It is guaranteed that the sum of n for all test cases does not exceed $4 \cdot 10^5$. It is also guaranteed that the sum of the maximum values of a_i for each test case does not exceed $4 \cdot 10^5$.
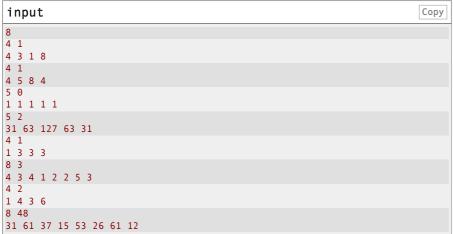
Output

For each test case, output "`YES`" on the first line if the condition can be met, on the second line, output the number of chosen numbers by Kirill and the numbers themselves in any order separated by a space, and on the third line, output the size of the second set and the numbers in it.

Otherwise, output "`NO`".

You can output each letter in any case (lowercase or uppercase). For example, the strings "`yEs`", "`yes`", "`Yes`", and "`YES`" will be accepted as a positive answer.

Example

input

```
8
4 1
4 3 1 8
4 1
4 5 8 4
5 0
1 1 1 1 1
5 2
31 63 127 63 31
4 1
1 3 3 3
8 3
4 3 4 1 2 2 5 3
4 2
1 4 3 6
8 48
31 61 37 15 53 26 61 12
```

Codeforces Round 935 (Div. 3)
Finished

→ Practice?

Want to solve the contest problems after the official contest ends? Just register for practice and you will be able to submit solutions.

[Register for practice]

→ Virtual participation ⌄

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest]

→ Problem tags

brute force   data structures   math
number theory   *2600

No tag edit access

→ Contest materials

- Announcement ✕
- Tutorial ✕

output

```
YES
2 4 8
2 3 1
YES
2 4 4
2 5 8
NO
YES
2 63 63
3 31 127 31
YES
2 3 3
2 1 3
YES
2 4 4
6 3 1 2 2 5 3
YES
2 3 6
2 1 4
YES
2 61 61
6 31 37 15 53 26 12
```

Copy