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Contest Code: [SNCK1A21](#) Problem Code: [BINFLIP](#)



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Chef has a binary string  $S$  of length  $N$ , where the first  $K$  characters of  $S$  are '1', while the rest are '0'. He wants to make all the characters equal to '0'. You are allowed to perform the following operation on the string  $S$  as long as  $2^{i-1} \leq N$ :

- In the  $i^{th}$  operation, you can select any contiguous range of  $2^{i-1}$  indices of  $S$  and flip their values.

He can use the above operation any number of times. If there is no sequence of operations that can convert the string to all '0's, print **NO**.

Otherwise, print **YES** in the first line and then describe the operations. Print the starting indices of the contiguous range to be flipped in each operation. See Output Format for further details.

#### Input Format

- First line of the input will contain  $T$ , the number of test cases. Then the test cases follow.
- Each test case contains a single line of input, two integers  $N, K$ .

#### Output Format

For each test case, do the following:

- If there is no sequence of operations to convert each character of  $S$  to '0', print **NO**.
- Otherwise, print **YES** in the first line. (You may print each letter in any case (for example, YES, Yes, yes, yEs will all be recognized as positive answer))
- In the second line print  $M$ , the number of operations you want to perform.
- Then print  $M$  lines describing the operations. In the  $i^{th}$  line, print the starting index  $L$  of the range  $[L, L + 2^{i-1} - 1]$  flipped in the  $i^{th}$  operation.
- The value of  $L + 2^{i-1} - 1$  should not exceed  $N$  in any operation.

#### Constraints

- $1 \leq T \leq 5000$
- $1 \leq N \leq 10^9$
- $0 \leq K \leq N$

#### Sample Input 1

```
3
5 0
3 3
2 2
```

#### Sample Output 1

```
YES
0
YES
2
3
```

1

NO

**Explanation**

**Test case 1:** Since  $K = 0$ , all the characters of string  $S$  are already '0'. So, there is no need to perform any operation.

**Test case 2:** We have  $N = 3$  and  $K = 3$ . So  $S = 111$ .

- In first operation, we can choose index 3 ( $2^{1-1} = 1$  indices) and flip it, giving  $S = 110$ .
- In the second operation, we can choose indices 1, 2 ( $2^{2-1} = 2$  indices) and flip them, giving  $S = 000$ .

Therefore, we can make each character of  $S$  to '0' by flipping index 3 in first operation and indices 1 and 2 in the second operation.

PYTH 3.6 (Python 3.6)

Code gets autosaved every second

```

1 # cook your dish here
2

```

0:0

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