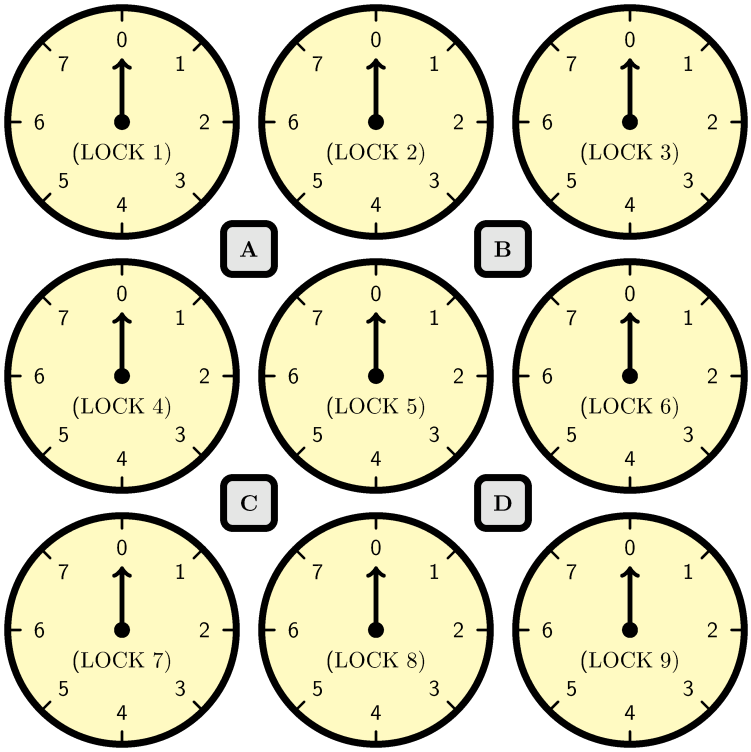
Problem J
Jewel Box

Minh has found an old mystery jewel box. On the top side of the box, there is a puzzle. It seems that solving this puzzle will open this box.

The puzzle has 9 circular locks and 4 pins. The locks are numbered from 1 to 9, the pins are called A, B, C and D. They are positioned like the following image:

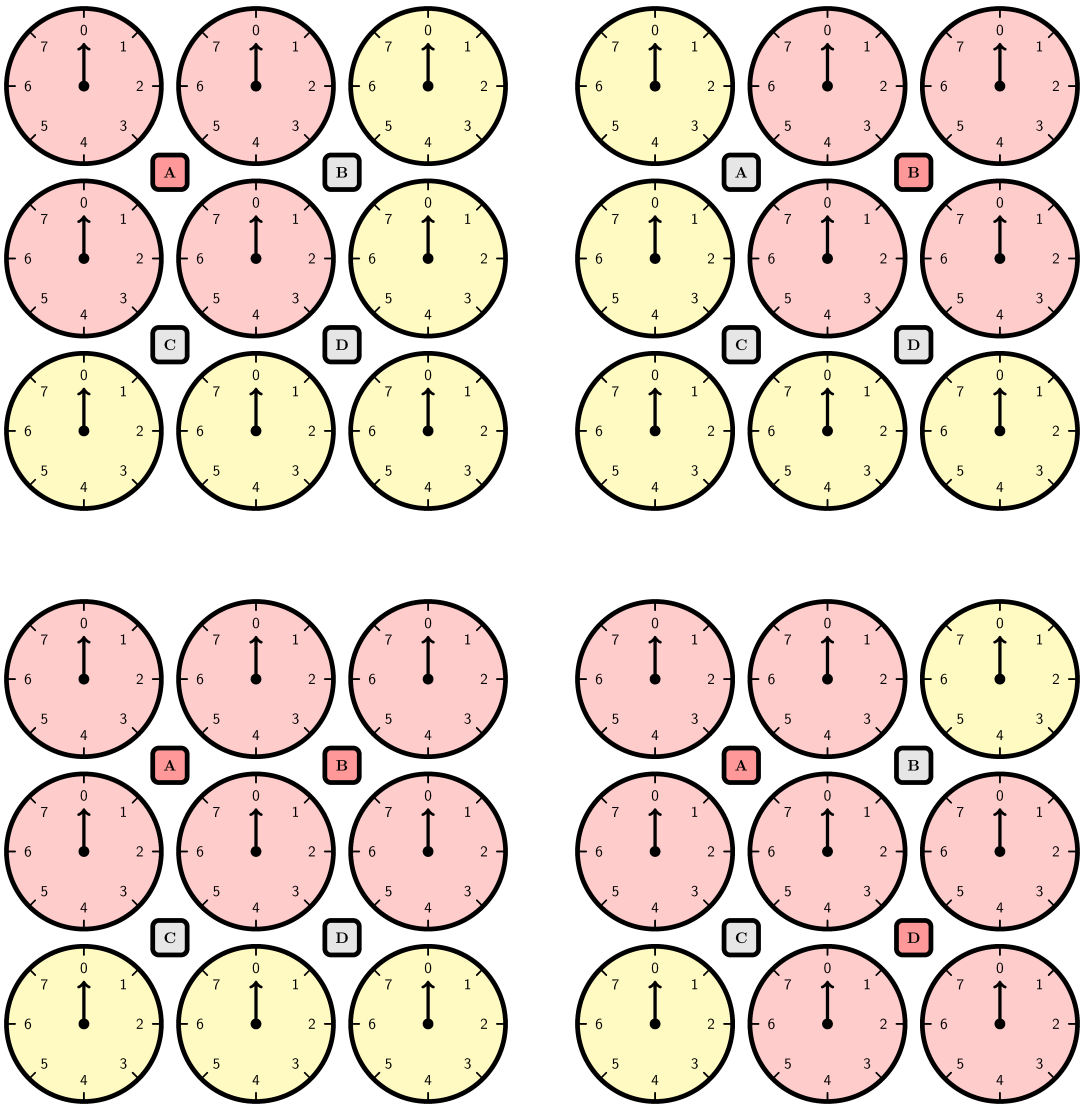


After playing with the jewel box for a while, Minh realized some properties of this box:

- Each lock has C numbers from 0 to $C - 1$.
- You only can rotate the 4 locks in the corners $1, 3, 7$ and 9; and only in clockwise direction.
- When a lock is rotated, if the current value of the lock is x, the new value of the lock will be $(x + 1)$ modulo C.
- You can turn on or turn off the pins as many times as you want.
- When a pin is turned on, 4 locks around that pin will rotate synchronously. In other words, if one lock is rotating, the other 3 locks will also rotate in the same way. For example:
  - If pin A is turned on, rotating lock 1 will cause locks $2, 4, 5$ to rotate.

- If pin B is turned on, rotating lock 3 will cause locks $2, 5, 6$ to rotate.
- If pins A and B are turned on while pins C and D are turned off, rotating lock 1 will cause locks $2, 4, 5$ to rotate. Because pin B is turned on, locks 2 and 5 rotating will also cause locks 3 and 6 to rotate. Thus, with pin A and pin B turned on, rotating lock 1 will cause 6 locks to rotate.
- If pin A and pin D are both turned on while pins B and C are turned off, locks $1, 2, 4, 5, 6, 8, 9$ will be synchronous.
- If pin A is turned on and all other pins are turned off, rotating lock 9 will only affect itself.

The following figures show the synchronous locks when some pins are turned on. Red and grey represent the on and off states, respectively.



Given the current state of the locks, your task is to help Minh to make all the locks to value 0. Please note that, you don't have to minimize the number of moves.

Input

The input starts with an integer C ($8 \leq C \leq 50$). Then, exactly 3 lines follow, each line contains exactly 3 integers between 0 and $C - 1$, inclusive, representing the initial state of the 9 locks.

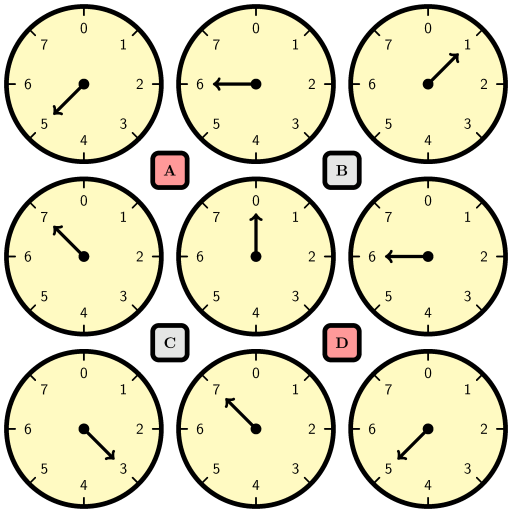
Output

If there is no solution, print a single line containing `NO`. Otherwise, print `YES` on the first line, followed by:

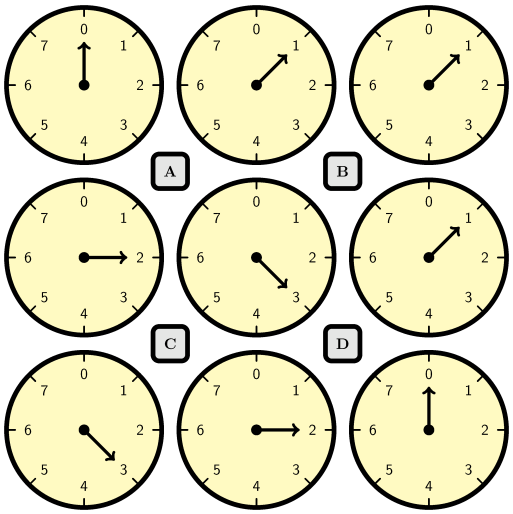
- A single line containing k — the number of steps ($0 \leq k \leq 1\,000$).
- In the next k lines, each contains 6 integers $p_A, p_B, p_C, p_D, c, rot$, where:
  - $p_A, p_B, p_C, p_D \in \{0, 1\}$ — represent the state of the pins: 1 represents the on state, while 0 represents the off state.
  - $c \in \{1, 3, 7, 9\}$ — the lock that we rotate.
  - $1 \leq rot \leq 100$ — the number of times we rotate.

Sample clarification

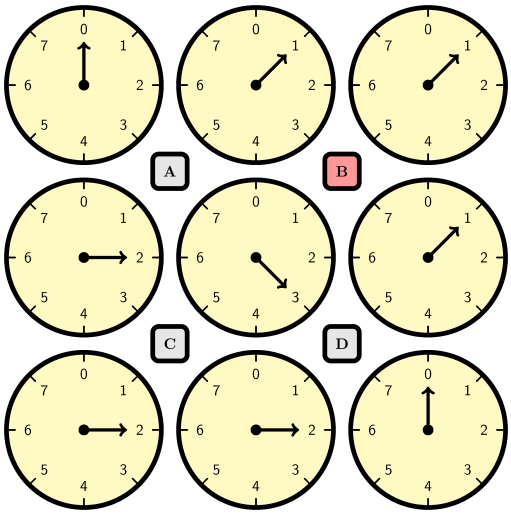
There are multiple solutions for this test case, this is one of them:



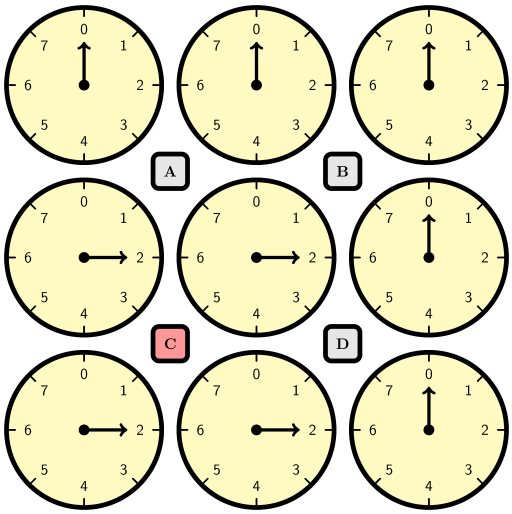
This is the initial state of the locks. With pin A and pin D on, we rotate lock 1 3 times.



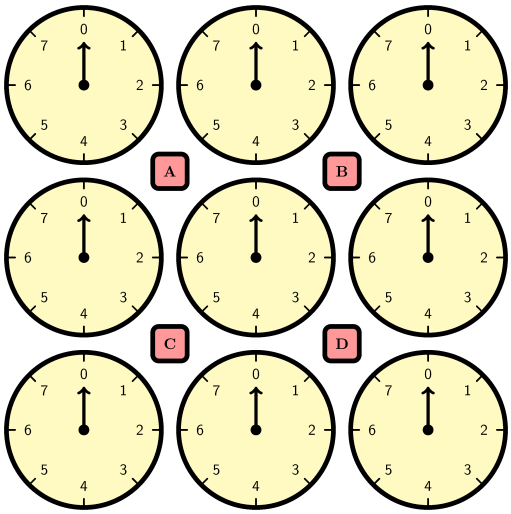
Turn off pin A and D. With all pins turned off, we rotate lock 7 7 times.



Now, we turn on pin B, and rotate lock 3 7 times.



One last move, turn off pin B, turn on pin C, and rotate lock 7 6 times.



We got what we want!

Sample Input 1

```
8
5 6 1
7 0 6
3 7 5
```

Sample Output 1

```
YES
4
1 0 0 1 1 3
0 0 0 0 7 7
0 1 0 0 3 7
0 0 1 0 7 6
```