UVa Online Judge

12782 Magic Squares

According to *Wikipedia*, "a *magic square* of order n is an arrangement of n^2 numbers, usually distinct integers, in a square, such that the n numbers in all rows, all columns, and both diagonals sum to the same constant". This constant is the *module* of the magic square. There are well-known magic squares such as the order 3 chinese Lo Shu magic square:

4	9	2
3	5	7
8	1	6

It is allowed to use any collection of n^2 integer numbers to build a magic square of order n. The Passion façade of the Sagrada Família church in Barcelona, designed by Josep Subirachs, displays the magic square of order 4 and module 33 shown in the following figure. Note that, in this example, the given numbers are not the first n^2 integers and that there are repetitions.

1	14	14	4
11	7	6	9
8	10	10	5
13	2	3	15

Armadora de Cuadrados Magicos (*ACM*) is a recently founded enterprise that is interested on applications of magic squares to cryptography. For that reason, they want to develop software to help magic square builders in detecting if a given sequence of integer numbers may be arranged in a magic square. Your task is to help ACM in this task.

Input

The input consists of several test cases, each one defined by a line containing a sequence of m blank-separated integers $x_1, x_2, \ldots, x_m$ ($1 \leq m \leq 16$, $-10^3 \leq x_i \leq 10^3$ for each $1 \leq i \leq m$).

Output

For each test case, output a line with exactly one letter: '`Y`' to indicate that a magic square may be built with the numbers provided for the case, or '`N`' otherwise.

Sample Input

```
1 2 3 4 5 6 7 8 9
1 14 4 14 11 7 6 9 8 13 10 2 10 3 5 15
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 8
1 2 3 4
1 1 -1 -1
1 1 1 1
-1 -1 -1 -1
1 1 1
```

Sample Output

```
Y
Y
N
N
N
Y
Y
N
```