# Comiendo galletas

Juan has $n$ different kinds of cookies. Of the $i$-th kind he has $a_i$ cookies. John wants to eat all the cookies, but he must follow a constraint: each day there must be a type of cookie $t$ such that the number of cookies he eats of type $t$ that day must equal the total number of cookies he eats of types other than $t$ that day.

For example, if $n = 3$ and $(a_1, a_2, a_3) = (4, 5, 7)$, a possible way to eat the cookies in two days would be as follows:

1. The first day he eats 4 cookies of the first type, one cookie of the second type, and 3 of the third type. In this day, he has eaten as many cookies of type $t = 1$ as cookies of other different types $(4 = 1 + 3)$.
2. The second day he eats 4 cookies of the second type and 4 cookies of the third type. He has eaten as many cookies of type $t = 2$ (or $t = 3$) as cookies of other types he has eaten $(4 = 0 + 4)$.

Can Juan eat all of the cookies? If so, you are asked to design a schedule of how many cookies of each type he must eat each day to meet his goal. John prefers to eat the cookies in fewer days, so your schedule should take at most $4n$ days, and to get the maximum score the schedule should take at most $\lceil \frac{n}{2} \rceil$ days.

## Input and output

The first line of the input contains the number of cases $T$.

For each case, the entry has one line with an integer $n$, followed by a second line with $n$ integers $a_1, \ldots, a_n$.

For each case, you must print a line with the word `SI` if it is possible for John to eat all the cookies, or with the word `NO` otherwise. In case the answer is `SI`, you must additionally print a line with an integer $d$, followed by $d$ lines, each with $n$ integers. The $i$-th number of line $j$ is the number of cookies of type $i$ that John eats in day $j$.

## Example

Input:

```
4
3
4 5 7
2
2 1
5
1 3 2 11 5
7
1 999999999 1000000000 1000000000 1000000000 1000000000 1000000000
```

Output:

```
SI
2
4 1 3
0 4 4
NO
SI
1
1 3 2 11 5
SI
3
1 999999999 1000000000 0 0 0 0
0 0 0 1000000000 1000000000 0 0
0 0 0 0 0 1000000000 1000000000
```

## Constraints

$1 \leq T \leq 50$.

$2 \leq n \leq 1000$.

$1 \leq a_i \leq 10^9$.

The sum of $n$ for all cases is at most 1000.

The $d$ that you print must satisfy $1 \leq d \leq 4n$.

The number of cookies Juan eats of each type must be a nonnegative integer, less than or equal to the number of cookies remaining of that type in that day.

## Subtasks

1. (5 points) $n = 3$.
2. (10 points) $n \leq 6$.
3. (9 points) All $a_i$ are equal.
4. (12 points) For all $1 \leq i \leq n$, $a_i = i$.
5. (14 points) The sum of all $a_i$ is less than or equal to $8n$.
6. (50 points) No additional restrictions.

Additionally, the score you get in a subtask depends on the value of $d$. The score of each subtask is multiplied by a multiplier $M(d, n)$: the value taken from $M(d, n)$ is the smallest among all the cases of the subtask.

$$M(d,n) = \begin{cases} 0 & d > 4n \\ 0.4 + 0.4 \cdot \left(\frac{n}{2d}\right) & 4n \geq d > \lceil \frac{n}{2} \rceil + 5 \\ 0.8 + 0.04 \cdot \left(\lceil \frac{n}{2} \rceil + 5 - d\right) & \lceil \frac{n}{2} \rceil + 5 \geq d > \lceil \frac{n}{2} \rceil \\ 1.0 & \lceil \frac{n}{2} \rceil \geq d \end{cases}$$