Kick Start 2019 - Round H

Elevanagram

Problem

It is a well known fact that a number is divisible by 11 if and only if the alternating sum of its digits is equal to 0 modulo 11. For example, 8174958 is a multiple of 11, since 8 - 1 + 7 - 4 + 9 - 5 + 8 = 22.

Given a number that consists of digits from 1-9, can you rearrange the digits to create a number that is divisible by 11?

Since the number might be quite large, you are given integers $\mathbf{A_1}$, $\mathbf{A_2}$, ..., $\mathbf{A_9}$. There are $\mathbf{A_i}$ digits i in the number, for all i.

Input

The first line of the input gives the number of test cases, **T**. **T** lines follow. Each line contains the nine integers $\mathbf{A_1}$, $\mathbf{A_2}$, ..., $\mathbf{A_9}$.

Output

For each test case, output one line containing `Case #x: y`, where `x` is the test case number (starting from 1) and `y` is `YES` if the digits can be rearranged to create a multiple of 11, and `NO` otherwise.

Limits

Time limit: 20 seconds per test set.
Memory limit: 1GB.
$1 \leq \mathbf{T} \leq 100$.
$1 \leq \mathbf{A_1} + \mathbf{A_2} + ... + \mathbf{A_9}$.

Test set 1 (Visible)

$0 \leq \mathbf{A_i} \leq 20$, for all i.

Test set 2 (Hidden)

$0 \leq \mathbf{A_i} \leq 10^9$, for all i.

Sample

Sample Input

```
6
0 0 2 0 0 1 0 0 0
0 0 0 0 0 0 0 0 12
0 0 0 0 2 0 1 1 0
```

Sample Output

```
Case #1: YES
Case #2: YES
Case #3: NO
Case #4: YES
```

```
3 1 1 1 0 0 0 0 0
3 0 0 0 0 0 3 0 2
0 0 0 0 0 0 0 1 0
```

```
Case #5: YES
Case #6: NO
```

- In Sample Case #1, the digits are `336`, which can be rearranged to `363`. This is a multiple of 11 since 3 - 6 + 3 = 0.
- In Sample Case #2, the digits are `999999999999`, which is already a multiple of 11, since 9 - 9 + 9 - 9 + ... - 9 = 0.
- In Sample Case #3, the digits are `5578`, which cannot be rearranged to form a multiple of 11.
- In Sample Case #4, the digits are `111234`, which can be rearranged to `142131`. This is a multiple of 11 since 1 - 4 + 2 - 1 + 3 - 1 = 0.
- In Sample Case #5, the digits are `11177799`, which can be rearranged to `19191777`. This is a multiple of 11 since 1 - 9 + 1 - 9 + 1 - 7 + 7 - 7 = -22 (which is 0 modulo 11).
- In Sample Case #6, the only digit is `8`, which cannot be rearranged to form a multiple of 11.