Happy Sets
Filename: `happy`

You have recently been awarded the prestigious title of Uncontested Calculus Führer of Orlando, FL. In an effort to prove to your colleagues that you deserve this title, you have invented an entirely new set of numbers, which, given your generally genial mood, you have aptly titled a 'Happy Set.' A happy set is any set of numbers A that can be rearranged in some way to meet the following property:

$$A_0 + A_1 - A_2 * A_3 / A_4 + A_5 - A_6 * A_7 / A_8 + A_9 - \cdots = An\ Integer\ Value$$

taking note that normal order of operations is *not* followed here, but each calculation is carried out sequentially. That is, first add A_o to A_1, then subtract A_2 from that value, then multiply A_3 by that value, and so on. Also note that if at any point along the way a calculation results in a value that is not an integer (or tries to make an illegal operation), then the set is a Sad Set.

It is guaranteed that the result x of each calculation will fall in the range $-2147483648 \le x \le 2147483647$.

The Problem

Although you are generally a happy person, you are also very lazy. Given this, you want to write a program that will solve this problem for you. Given a set of numbers A, you must determine whether any permutation of that set A results in a Happy Set.

The Input

The input file to this program will begin with an integer, $n \ge 1$, indicating the number of data sets to be processed.
On each of the next n lines one test case will appear. The first integer in each list, k, $2 \le k \le 9$, will indicate the number of values for that test case, and will be followed by k integers. All k integers are guaranteed to be positive, unique, and will fit in an integer data type.

The Output

Each data set should output one of the following lines:

```
Set i is a Happy Set =)
Set i is a Sad Set =(
```

where i is the number of the data set (starting at 1).

Sample Input

```
2
6 3 4 1 5 2 12
6 223 251 41 434 201 277
```

Sample Output

```
Set 1 is a Happy Set =)
Set 2 is a Sad Set =(
```