Balance

Filename: balance

Recently, you heard of the case where a restaurant that claimed to offer a 500 gram steak was cheating its customers by providing steaks that weighed less. You've decided that you want to fight this injustice. However, instead of having a scale, all you have is a balance and a set of weights. With these limitations, the only way you can verify that an item is exactly the weight claimed by the restaurant is to arrange the item and some of your weights on the balance so that both sides perfectly balance. For example, if you had a 100 g weight and a 500 g weight, you could verify that a particular food item weight exactly 400 g by placing that food item on left side of the balance with the 100 g weight and putting the 500 g weight on the other side and seeing if the two sides perfectly balanced.

The Problem

Given a set of weights available to you, as well as a target weight you are attempting to "verify" determine whether or not there exists a way for you to verify that an item weighs exactly the target weight.

The Input

The first line of the input file will contain a number n $(1 \leq n \leq 1000)$ indicating food the items to be verified. Each of the following n lines starts with a positive integer, w $(1 \leq w \leq 15)$, indicating the number of weights you have to use. (Note that you don't have to put all of them on the balance. Thus, for each weight, you can either put it on the left side, the right side, or not place it at all.) This will be followed with w space-separated integers, each in between 1 and 5000000, indicating the weight in grams, of each of the weights you have to use. This will be followed by a single integer, t $(1 \leq t \leq 75000000)$, indicating the supposed weight of the food item you are attempting to verify using that set of weights.

The Output

For each case, output "true" if the target weight can be verified, or "false", if it can't, on a line by itself.

Sample Input

```
3
2 100 500 400
5 1 2 3 4 5 16
3 1 4 7 2
```

Sample Output

```
true
false
true
```