Balancing Weights

John has a beam scale and a small collection of weights with different masses.

After placing a single weight in one of the scale's bowls, John wants to know if he can use the remaining weights to even out the height of both bowls.

Input Format

The input consists of multiple test cases, each one occupying a single line.

Each test case begins with the mass *M* (in kilograms) of the weight that John placed on one of the bowls and the number *n* of remaining weights. The following *n* values are sorted in non-increasing order and correspond to the masses *m* of the other weights. All of the masses are integers.

The input ends with a zero.

Constraints

- 1 <= M <= 1000
- 1 <= n <= 12
- 1 <= m <= 100

Output Format

For each test case, start by printing a line with the format "Weights for M:", where M is the mass of the target weight. Then, print one line for each possible group of weights, by printing their masses in descending order and separated by " + ". The lines must be printed in order so that group with the heaviest mass comes first. In case of a tie, the groups are sorted according to the second heaviest mass, and so on. No two lines can be equal.

If a test case has no solutions, print a second line with "No solutions".

Sample Input 0

```
4 8 4 3 2 2 1 1 1 1
5 1 6
0
```

Sample Output 0

```
Weights for 4:
4
3 + 1
2 + 2
2 + 1 + 1
1 + 1 + 1 + 1
Weights for 5:
No solutions
```