Two coins of each kind (1) $\qquad$ P62113_en

Given a natural number x and n different coin values $c_1 \dots c_n$, compute in how many ways it is possible to achieve change x by using each value at most twice. Here, two coins with the same value are considered different.

For example, if $x = 4$ and the available values are 1 and 2, then there are three ways to achieve it: $1 + 1' + 2$, $1 + 1' + 2'$, and also $2 + 2'$.

Input

Input consists of several cases. Every case begins with x and n, followed by $c_1 \dots c_n$. Assume $1 \le n \le 20$, $1 \le c_i \le x \le 1000$, and that all c_i are different.

Output

For every case print, in lexicographic order, all possible ways to exactly achieve change x by using each value at most twice. Print every solution with its values sorted from small to big. In doing that, assume $1 < 1' < 2 < 2' < \dots$. Use "1p" to print $1'$, etcetera. Print a line with 10 dashes at the end of every case.

Hint

A simply pruned backtracking should be enough.

Sample input 1

```
4 2   1 2
400 1   200
400 1   300
5 3   4 2 1
5 5   1 2 3 4 5
```

Sample output 1

```
4 = 1 + 1p + 2
4 = 1 + 1p + 2p
4 = 2 + 2p
----------
400 = 200 + 200p
----------
----------
5 = 1 + 2 + 2p
5 = 1 + 4
5 = 1 + 4p
5 = 1p + 2 + 2p
5 = 1p + 4
5 = 1p + 4p
----------
5 = 1 + 1p + 3
5 = 1 + 1p + 3p
5 = 1 + 2 + 2p
5 = 1 + 4
5 = 1 + 4p
5 = 1p + 2 + 2p
5 = 1p + 4
5 = 1p + 4p
5 = 2 + 3
5 = 2 + 3p
5 = 2p + 3
5 = 2p + 3p
```

```
5 = 5
5 = 5p
```

Problem information

Author: Salvador Roura
Translator: Albert Atserias

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