Interpersonal dislikes   P98089_en

Given n people and the grade of dislike between them, choose how to make them sit at a long table, in such a way that the sum of the interpersonal dislikes of the neighbor persons is minimum, with one restriction: the leftmost person must be the first person given.

Input

Input consists of several cases, each with n, followed by n different names, followed by an $n \times n$ matrix of natural numbers between 0 and 10^6, where the position (i, j) has the dislike between people i and j. The matrix is symmetric, with zeroes at the diagonal. You can assume $1 \le n \le 12$.

Output

For every case, print the minimum sum of dislikes, followed by the optimum placement of people at the table. The test cases are such that there is always a unique solution.

Sample input 1

```
3
anna maria nuria
0 3 1
3 0 9
1 9 0

1
salvador
0

4
a b c d
0 1000 1000000 10
1000 0 50000 30
1000000 50000 0 7
10 30 7 0
```

Sample output 1

```
10
anna nuria maria
0
salvador
1037
a b d c
```

Problem information

Author: Salvador Roura
Translator: Salvador Roura

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