Tour d'Absurdistan

Once a year, the people of Absurdistan invite sportspersons from all around the world to compete in a long muscle-powered segway race that spans over the course of three weeks. The race always goes through most of the larger cities in Absurdistan – for example, Preposteropolis, Ridiculousia, and Ludicrous City come to mind – but the routes it will take in between these cities and the order in which the cities are visited are not fixed yet. Because Lea's reputation for solving these kinds of problems has reached even to Absurdistan, she is asked to do it. But there are three important rules which the tour must fulfill to be officially called "*Tour d'Absurdistan*": Firstly, each city must be visited, but only once; secondly, the total distance should be as low as possible, and thirdly, the tour must end in the same city in which it started. Can you tell Lea how to do it?

Input

The first line of the input contains an integer t. t test cases follow, each of them separated by a blank line.

Each test case starts with an integer n, the number of cities (indexed from 1 to n). n lines follow describing the distances between the cities, each containing n integers $l_{i,1}, \ldots, l_{i,n}$ with $l_{i,j}$ being the distance from city i to city j. Note that connections are undirected, i.e., $l_{i,j} = l_{j,i}$ and $l_{i,i} = 0$.

Output

For each test case, output one line containing "Case #i: x" where i is its number, starting at 1, and x the optimal tour given as a space-separated sequence of all cities. As this is a tour where every city appears only once, the order in which the cities are given is not important as the sequence can be shifted such that the first city appears as the first element in the sequence. It is implicitly assumed that the tour goes around, i.e., after leaving the last city, the competitors race back to the finish line in the first city. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 8$
- $1 \leq l_{i,j} \leq 1000$ for all $1 \leq i, j \leq m, i \neq j$
- The distance from city i to city i will always be 0.

Sample Input 1	**Sample Output 1**
2 4 0 11 8 8 11 0 11 3 8 11 0 10 8 3 10 0 4 0 10 12 5 10 0 8 13 12 8 0 7 5 13 7 0	Case #1: 1 3 2 4 Case #2: 1 2 3 4

Sample Input 2

```
10
4
0 7 4 2
7 0 1 4
4 1 0 9
2 4 9 0

4
0 7 3 3
7 0 3 2
3 3 0 7
3 2 7 0

3
0 2 2
2 0 2
2 2 0

3
0 5 9
5 0 6
9 6 0

4
0 9 1 7
9 0 2 10
1 2 0 9
7 10 9 0

3
0 8 8
8 0 2
8 2 0

3
0 2 1
2 0 4
1 4 0

5
0 8 8 3 4
8 0 7 4 1
8 7 0 10 1
3 4 10 0 7
4 1 1 7 0

4
0 10 6 3
10 0 6 2
6 6 0 8
3 2 8 0

3
0 2 1
2 0 1
1 1 0
```

Sample Output 2

```
Case #1: 1 3 2 4
Case #2: 1 3 2 4
Case #3: 1 2 3
Case #4: 1 2 3
Case #5: 1 3 2 4
Case #6: 1 2 3
Case #7: 1 2 3
Case #8: 1 3 5 2 4
Case #9: 1 3 2 4
Case #10: 1 2 3
```