

UCF Tours

Filename: tours

The Problem

Any UCF student can tell you that the number of tour groups seen around UCF during the summer is exponentially higher than the rest of the year. Campus tours are an important part of college recruitment—incoming students (and their parents) can get a real feel for the campus. However, most people are notoriously lazy and will get annoyed if there is too much walking on their tour. For this reason, UCF has hired you to figure out the shortest walking tour at UCF. You are allowed to visit the points of interest in any order you want, but you must visit each one exactly once, and you must start and end the tour at the same place.

Because the campus of UCF is constantly changing, your program should be able to handle multiple campus maps.

The Input

There will be several test cases. Input will begin with a single positive integer T giving the number of test cases. Each test case will begin with a positive integer N ($2 \leq N \leq 8$) indicating the number points of interest on campus. This will be followed by N lines, each containing exactly N integers, giving the time to walk between each of the points of interest. The j^{th} number on the i^{th} line will be the time it takes to walk from i to j . The i^{th} number on the i^{th} row will always be 0, and the j^{th} number on the i^{th} row will be the same as the i^{th} number on the j^{th} row. All times will be positive integers ≤ 30 .

The Output

For each case, output a single line

Case #X: Y minutes

where X is the case number beginning with 1, and Y is the time of the shortest campus tour.

[Sample Input/Output on next page]

Sample Input

```
3
3
0 3 4
3 0 6
4 6 0
4
0 12 10 7
12 0 6 3
10 6 0 4
7 3 4 0
8
0 8 20 8 16 18 18 10
8 0 19 19 20 20 11 13
20 19 0 22 8 22 12 12
8 19 22 0 12 4 22 28
16 20 8 12 0 23 12 25
18 20 22 4 23 0 9 4
18 11 12 22 12 9 0 10
10 13 12 28 25 4 10 0
```

Sample Output

```
Case #1: 13 minutes
Case #2: 26 minutes
Case #3: 67 minutes
```