

Problem A

Cloud System

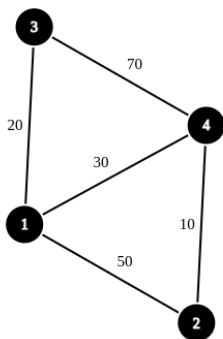
Time Limit: **3 seconds**
Mem limit: **512 Megabytes**

VNU-HCM University of Science has just built a new cloud computing system to run experiments of research projects related to deep-learning.

The system consists of N servers (numbered from 1 to N). Each pair of servers is connected by at most 1 cable (possibly 0).

The cable connecting server u and server v has the transmission capacity of $C_{u,v}$ megabits per nanosecond.

Let us define $F_{u,v}$ as the data transfer rate between server u and server v . To transfer data from server u to server v , data can be split into multi parts and transferred via multiple routes.



For example, to transfer data from server 1 to server 4, data can be split into 3 parts and transferred via 3 routes as follows:

- 1 - 4 (30 Mb per nanosecond)
- 1 - 3 - 4 (20 Mb per nanosecond)
- 1 - 2 - 4 (10 Mb per nanosecond)

so the transfer rate from 1 to 4 is 60 Mb per nanosecond or $F_{1,4} = 60$.

You are given the configuration of the network and the transmission capacity of cables, your task is to compute F .

Input

The input starts with T – the number of test cases. Then T test cases follow.

Each test case starts with an integer N , the number of servers in the network ($1 \leq N \leq 200$).

In the next N lines, each line contains N integers $C_{u,v}$ ($0 \leq C_{u,v} \leq 10000$).

It is guaranteed that $C_{u,v} = C_{v,u}$ and $C_{u,u} = 0$.

Note: The sum of N in the input does not exceeded 1000.

Output

For the t^{th} test case, print "Case #t:". The next N lines, print the $N \times N$ matrix F .

Sample input

```
2
4
0 50 20 30
50 0 0 10
20 0 0 70
30 10 70 0
4
0 10 0 0
10 0 0 0
0 0 0 10
0 0 10 0
```

Sample output

```
Case #1:
0 60 60 60
60 0 60 60
60 60 0 90
60 60 90 0
Case #2:
0 10 0 0
10 0 0 0
0 0 0 10
0 0 10 0
```