

Problem A

Cloud System

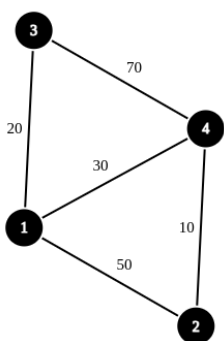
Time Limit: **3 seconds**
Mem limit: **512 Megabytes**

Ho Chi Minh University of Science has just build a new cloud computing system to run experiences of their research related of deep-learning.

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

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

Let's define $F_{u,v}$ the data transfer rate between server u and server v . To transfer data from server u to server v , the data can be splitted into multi parts and transfer 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 following routes:

- 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 capacity of the 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 N the number of servers in the network ($N \leq 200$).

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

Sample output

<pre>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</pre>	<pre>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</pre>
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