Dungeon

Time limit: 2 sec.
Memory limit: 512MB

Description

Sungsoo is playing a dungeon crawling game. Each game consists of a set of up to n rooms. One of the rooms is the start and one of the rooms is the finish. Each room has an energy value v. One-way doorways interconnect pairs of rooms.

The player begins in the start room with 0 fatigue points. He may pass through any doorway that connects the room he is in to another room, thus entering the other room. The fatigue value of this doorway is added to the player's score. This process continues until he wins by entering the finish room. During his adventure the player may use the same doorway several times, increasing or decreasing the score each time.

The final score is calculated by the final fatigue value when Sungsoo enters the finish room. However, Sungsoo does not know where the finish room is, nor where the starting room is. So Sungsoo wants to know the lowest score he can receive in this game for every pair of starting and finish room. Can you help Sungsoo find this?

Input

The first line of the input contains two integers, the number of rooms n. The rooms are numbered from 1 to n. ($1 \leq n \leq 300$)

The i-th line of the next n lines contains n integers, v_{i1}, v_{i2}, v_{i3}, …, v_{in}. ($-5000000 \leq v_{ij} \leq 5000000$), where v_{ij} denotes the fatigue value of the doorway connecting from room I to room j.

Output

If Sungsoo can make the score as low as he wants when he starts and ends in an appropriate room, print "-INF".

Else, print n lines containing n integers. The i-th line's j-th integer denotes the lowest possible score Sungsoo can get when the starting room is room i and the finish room is room j. i-th integer of i-th line is always 0.

Sample I/O

Input(s)	Output(s)
3 0 31 4 15 0 -1 26 5 0	0 9 4 15 0 -1 20 5 0
2 0 -1 -1 0	-INF