

Super Backpack

Input file: `stdin`
Output file: `stdout`
Time limit: 5 seconds
Memory limit: 256 megabytes

There are n types of items. Vasya has k_i items of type i . j -th item of type i takes up j units of volume and has value of $a_{i,j}$. Vasya wants to pick exactly one item of each type so that their total volume is exactly t . Help Vasya determine maximal total value of items he can pick.

Input

The first line contains one integer n ($1 \leq n \leq 10^5$).

i -th of the next n lines contains an integer k_i followed by k_i integers $a_{i,j}$ ($1 \leq k_i \leq 5$; $0 \leq a_{i,j} \leq 10^9$).

Output

For each t from n to $k_1 + \dots + k_n$ print the answer for this t . Separate answers by spaces.

Examples

stdin	stdout
3	10 12 11 10 8
2 4 3	
3 1 3 2	
2 5 3	