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PROBLEMS SUBMIT STATUS STANDINGS CUSTOM TEST

# D. Greg and Graph

time limit per test: 3 seconds memory limit per test: 256 megabytes input: standard input output: standard output

Greg has a weighed directed graph, consisting of n vertices. In this graph any pair of distinct vertices has an edge between them in both directions. Greg loves playing with the graph and now he has invented a new game:

- The game consists of *n* steps.
- On the *i*-th step Greg removes vertex number x<sub>i</sub> from the graph. As Greg removes a
  vertex, he also removes all the edges that go in and out of this vertex.
- Before executing each step, Greg wants to know the sum of lengths of the shortest paths between all pairs of the remaining vertices. The shortest path can go through any remaining vertex. In other words, if we assume that d(i,v,u) is the shortest path between vertices v and u in the graph that formed before deleting vertex  $x_i$ , then Greg wants to know the value of the following sum:  $\sum_{v,u,v\neq u} d(i,v,u).$

Help Greg, print the value of the required sum before each step.

## Input

The first line contains integer n ( $1 \le n \le 500$ ) — the number of vertices in the graph.

Next n lines contain n integers each — the graph adjacency matrix: the j-th number in the i-th line  $a_{ij}$  ( $1 \le a_{ij} \le 10^5$ ,  $a_{ii} = 0$ ) represents the weight of the edge that goes from vertex i to vertex j.

The next line contains n distinct integers:  $x_1, x_2, ..., x_n$   $(1 \le x_i \le n)$  — the vertices that Greg deletes.

## Output

Print n integers — the i-th number equals the required sum before the i-th step.

Please, do not use the %11d specifier to read or write 64-bit integers in C++. It is preferred to use the cin, cout streams of the %164d specifier.

#### **Examples**

input	Сору
1 0 1	
output	Сору
0	

input	Сору
2	
0 5	
4 0	
1 2	

#### → Attention

Package for this problem was not updated by the problem writer or Codeforces administration after we've upgraded the judging servers. To adjust the time limit constraint, solution execution time will be multiplied by 2. For example, if your solution works for 400 ms on judging servers, then value 800 ms will be displayed and used to determine the verdict.

## Codeforces Round #179 (Div. 2)

#### **Finished**

# → Virtual participation

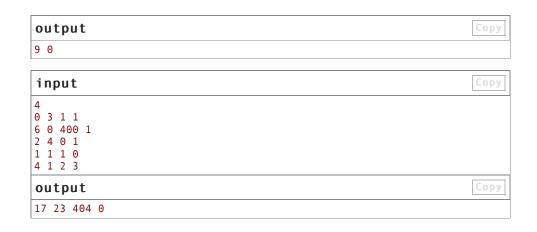
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Start virtual contest

# → **Problem tags**dp graphs \*1700 No tag edit access

#### → Contest materials

<ul> <li>Announcement</li> </ul>	$\times$
Tutorial	×



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