Lily in LaLa Land

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

LaLa Land contains **N** cities, connected by N-1 bidirectional roads such that from any city, you can reach any other cities by following some roads.

LaLa Land is a very weird country, everyday in LaLa Land government chooses a road with uniform randomness and blocks the chosen road so that nobody can pass through that road.

Each city in Lala Land has certain number of shops. Lily has planned to make **(N*(N-1))** visits to country to shop as much as she can.Each visits of Lily to Lala Land, last a day.As Lily is a shopping maniac she has decided to shop at all shops in all the cities that are **reachable** from the city she starts her trip (including the city, she starts at). As she does not know which road government will block on that particular day , she select a city to start with uniform randomness each day.

Lily' s boyfriend is too concerned about this trip and has asked you to compute the expected number of shops she will visit in these N*N-1 days.

Input

The first line contains an integer **N**, which is the number of cities in Lala land.
Next lines contains N integers where ith integer is the number of shops in ith city.
Next N-1 line contains 2 integers **u,v** denoting that there is a road between u and v.
where

$1 \leq N \leq 3*10^5$
$1 \leq u,v \leq N$

Number of shops in each city is atmost 10

Output

Print one real value — the expected number of shops that she will visit in these N*N-1 visits. Your answer will be considered correct if its absolute or relative error does not exceed 10^{-6}.

Example

standard input	standard output
4 1 1 0 2 1 2 1 3 2 4	28

Note

Do not print trailing zeroes.i.e don't print 10.00000 print just 10.

City A is **reachable** to city B if there exist some set of roads such that there exist a simple path from A to B.