

Problem F

Dijkstra

Dijkstra's algorithm, conceived by computer scientist Edsger Dijkstra in 1956 and published in 1959, is a graph search algorithm that solves the single-source shortest path problem for a graph with non-negative edge path costs³.

For a give node in a graph, the algorithm finds the path with lowest cost (i.e. the shortest path) between that node and the destination node. Figure F1 shows a graph.

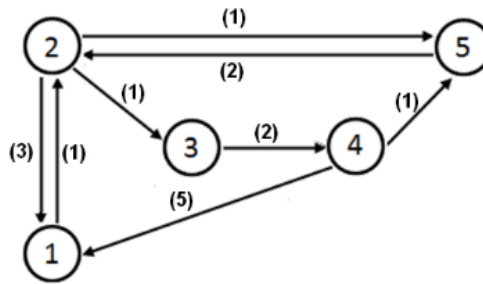
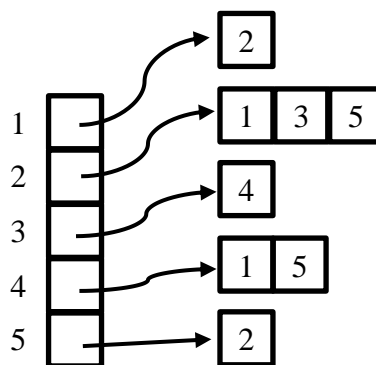


Figure F1. A simple graph.

An adjacency list representation for a graph associates each node in the graph with the collection of its neighboring nodes⁴. I.e, for Figura F1, its representation can be:



This list also can store the weight of each edge or other information that helps the algorithm finding the shortest path.

Write a parallel version of the Dijkstra's algorithm.

³ Dijkstra's algorithm. URL: http://en.wikipedia.org/wiki/Dijkstra's_algorithm .

⁴ Adjacency list. URL: http://en.wikipedia.org/wiki/Adjacency_list .

Input

The input contains 3 integers. The first integer represents the total number of nodes in the graph ($2 \leq V \leq 50$). The second integer represents the average number of outgoing edges per node ($1 \leq E \leq V/2$). The last integer represents the seed for a random number generator ($0 \leq S < 2^{32}$).

The input must be read from the standard input.

Output

The output has only one number. It represents the mean distance from node 0 to all nodes.

The output must be written to the standard output.

Example

Input	Output for the input
5 2 6	14.20