Route Selection

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Market fair is a long-standing traditional folk trading activity that refers to the trading of goods and social gatherings held on specific dates and at fixed locations, characterized by distinct folk customs and regional cultural differences.

Today, in your city, a Dragon Boat Festival fair is taking place, and you plan to visit k stalls. Specifically, the venue is organized as an $n \times m$ grid, consisting of n rows of grid points, with m grid points in each row, and the spacing between rows and columns is 1. We denote the coordinates of the top-left grid point as $(0, 0)$ and the bottom-right grid point as $(n-1, m-1)$. The entrance of the fair is at $(0, 0)$, and the exit is at $(n-1, m-1)$. You need to start from the entrance, visit the k stalls in any order, and finally reach the exit. The stalls are set along the edges of the grid and can be considered as points on the edges of the grid. Formally, the coordinates of each stall are (x, y), where either x or y is an integer.

You need to move along the edges of the grid, but the fair is bustling, and you want to finish your visit as quickly as possible. Due to varying crowd densities, the speed of movement along each edge differs, and you want to know the shortest time required to start from the entrance, visit all k stalls, and reach the exit. The time spent at the stalls is negligible.

Input

The first line contains three integers n, m, k ($2 \le n \le 50, 2 \le m \le 4, 1 \le k \le 10^5$).

The next n lines contain the i-th line with $m-1$ integers $v^h_{i,0}, v^h_{i,1}, \ldots, v^h_{i,m-2}$ ($1 \le v^h_{i,j} \le 10^5$), where $v^h_{i,j}$ represents the speed of movement along the horizontal edge from $(i-1, j)$ to $(i-1, j+1)$.

The next $n-1$ lines contain the i-th line with m integers $v^v_{i,0}, v^v_{i,1}, \ldots, v^v_{i,m-1}$ ($1 \le v^v_{i,j} \le 10^5$), where $v^v_{i,j}$ represents the speed of movement along the vertical edge from $(i-1, j)$ to (i, j).

The next k lines each contain two real numbers x, y ($0 \le x \le n-1, 0 \le y \le m-1$), representing the coordinates of the stalls you intend to visit. It is guaranteed that at least one of x or y is an integer, and the decimal places do not exceed 3. It is also guaranteed that the positions of these k stalls are distinct.

Output

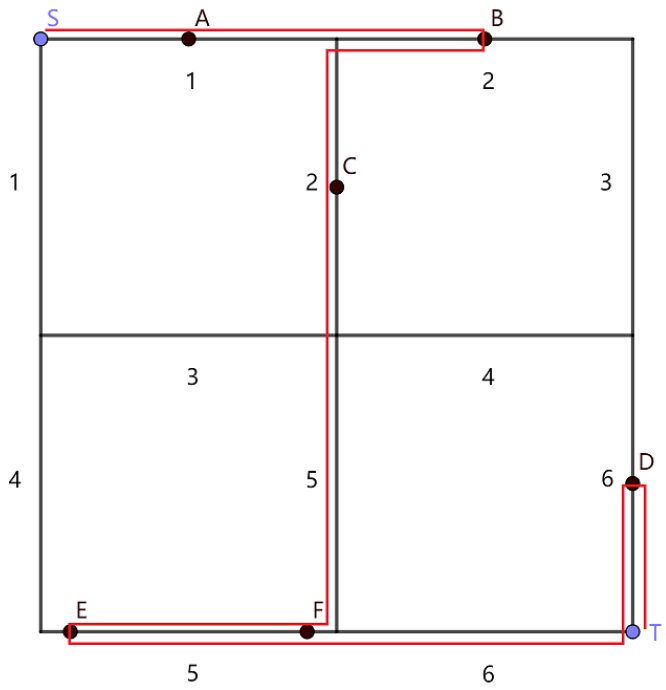
Output a single line with a real number, representing the shortest time required to start from the entrance, visit all k stalls, and reach the exit. If the absolute or relative error of your output compared to the answer does not exceed 10^{-6}, your output will be considered correct.

Example

standard input	standard output
3 3 6 1 2 3 4 5 6 1 2 3 4 5 6 0 0.5 0 1.5 0.5 1 1.5 2 2 0.1 2 0.9	2.893333333

Note

For the sample, let S represent the entrance and T represent the exit. The stalls are numbered from A to F in the order they appear in the sample. One of the feasible routes with the shortest travel time is shown in the figure below.



The numbers next to the edges indicate the speed of movement along that edge.