B. Coin Game

Time limit: 1 second
Memory limit: 65535 kBytes

Description

Adam and Bob are brothers who enjoy playing various games with their collection of shiny coins. Right now, they are playing a game in which each kid has one or more **piles** of coins in front of them on the table. Each pile of coins contains some (at least 1) coin pieces. Meanwhile, Dad prepares to go to the post office and send a holiday card to the grandmother of the boys. Sending the postcard requires D coins, but, unfortunately, Dad does not have any coins at hand. He decides to take some of the coins from the kids.

To make it fair, he comes up with the following process to collect the coins: in each turn, he selects one of the piles on the table with equal probability. He then takes one coin from the selected pile, and the turn ends. The process ends when there arent any coins left on the table, or once Dad manages to collect D coins total (i.e., after taking D turns). If a pile does not contain any coin at the end of a turn, then it wont be considered again for selection. Adam and Bob are worried about their precious coins. They want to know the probability of Dad taking all their own coins (the coins in front of Adam are considered to be Adams and vice versa). Help them and compute this probability for both children!

Input

The first line of the input contains N, M, and D, the number of piles in front of Adam and Bob, respectively ($1 \leq N, M \leq 5$), and the number of coins Dad wants to take ($1 \leq D \leq 100$). The second line contains N integers, the number of coins in each pile in front of Adam ($1 \leq A_i \leq 6$). The third line contains M integers, the number of coins in each pile in front of Bob ($1 \leq B_i \leq 6$).

Output

Output two lines. The first line should contain the probability of taking every coin from Adam by the end of the process. The second line should contain the same probability for Bob. Print each probability rounded to 6 digits after the decimal point, in the format X.XXXXXX.

Example

Input	Output
1 2 2 2 1 1	0.111111 0.333333

Explanation: In this example, there is one pile containing two coins in front of Adam, and two piles containing a single coin each in front of Bob. Dad wants to take 2 coins. The only way to take every coin from Adam is to pick the pile in front of him twice, with probability $1/3 \cdot 1/3 = 1/9$.

On the other hand, the only way to take every coin from Bob is to pick one of his two piles first (with probability 2/3). The chosen pile is removed, so the probability of selecting the remaining pile of Bob the second time is 1/2 (as there is one pile in front of each of them at this stage). This gives the probability $2/3 \cdot 1/2 = 1/3$.

Input	Output
2 3 12 3 2 4 2 3	0.565991 0.137738

Input	Output
5 4 33 4 5 4 2 6 1 3 6 2	1.000000 1.000000