UVa Online Judge

# 13162 Dinner Bet


Cesar and Raul like betting and good food, in no particular order. They want to try out a new fancy restaurant and they decided to make a bet – they are going to play a game and the loser pays for dinner.

They have a box with $N$ balls. Each ball contains a distinct number between 1 and $N$. Then, the game proceeds with these steps:

- Initially, each person picks $C$ distinct numbers between 1 and $N$ and writes them down on a separate card.
- In each round, $D$ balls are drawn from the box uniformly at random. Cesar and Raul mark down the ball numbers that appear in their respective card. The $D$ balls are then returned to the box.
- The game stops when a player is able to mark on the card all the numbers he chose. That player is the winner. If both players finish at the same time, it is a draw and they will split the dinner.

They are quite eager to try out this new restaurant and they're now wondering: how many rounds will the game last?

Given the number $N$ of balls, the number $D$ of balls they draw from the box in each round, the amount $C$ of numbers in their cards and the numbers they wrote down, find the expected number of rounds the game will last.

## Input

The input file contains several test cases, each of them as described below.

The first line of the input consists of three space separated integers: $N$, $D$, and $C$. $N$ is the number of balls, $D$ is the number of balls drawn in each round, and $C$ is the cards' size. Each of the following two lines contains $C$ space separated integers: the numbers Cesar and Raul wrote down, respectively.

### Constraints

| | |
|---|---|
| $1 \leq N \leq 50$ | Number of balls in the box |
| $1 \leq D \leq \min(10, N)$ | Number of balls drawn in each round |
| $1 \leq C \leq \min(10, N)$ | Cards' size |

## Output

For each test case, the output is the expected number of rounds of the game, on a line by itself.

The result will be considered correct as long as the absolute error does not exceed $10^{-3}$.

**Explanation for the first sample input below:** There are 2 balls. Cesar picked number 1 and Raul picked number 2. In the first round, either number 1 or 2 will be drawn and so one of them wins right away.

## Sample Input

```
2 1 1
1
2
30 5 10
2 3 5 7 11 13 17 19 23 29
20 18 16 14 12 10 8 6 4 2
```

## Sample Output

```
1.00000
13.30378
```