

Problem C

Elevator

Input file: *testdata.in*

Time limit: 2 seconds

Problem Description

In a skyscraper people take elevators to go to their destination floors. However if elevators are not well placed at the beginning, people will spend a lot of time waiting for the elevators. If an elevator takes a unit of time to move from one floor to the next floor, what is the minimum possible expected waiting time for all requests? Formally when we are given the height of the skyscraper (H), the number of elevators (E), the initial placement of E elevators, and the probability that requests come from each floor, how to minimize the expected waiting time for all requests?

For example, we assume that there are two elevators in a skyscraper of eleven floors, and the ratio among the probability that a request comes from a particular floor is $10 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1$. Now if we place the elevators on the *first* and the *eighth* floors, then in average a request will be served in $\frac{9}{10}$ unit of time. Let p_i be the probability that a request comes from floor i . In this example, $p_1 = \frac{10}{20} = 0.5$ and all p_i from all other floors will be $\frac{1}{20} = 0.05$. We also assume that a request will be served by the nearest elevator, so the request from the fifth to the eleventh floor will be served by the elevator at the eight floor, and the requests from the first to the fourth floor will be served by the elevator at the first floor. As the result in average a request will be served in $\sum_{1 \leq i \leq 4} |i - 1| \times p_i + \sum_{5 \leq i \leq 11} |i - 8| \times p_i = \frac{9}{10}$.

Technical Specification

- $1 \leq H \leq 1000$

- $1 \leq E \leq 20$
- The probability ratio for request from each floor is represented by a non-negative integer no greater than 5000.

Input Format

There are several test cases (no more than 20). The first line of a test case has two integers, H and E . The next line has H integers for the probability ratio from the first to the N -th floor.

Output Format

For each test case output the minimum expected waiting time in simple fraction form. If the denominator is 1 you only output the numerator.

Sample Input

```
11 2
10 1 1 1 1 1 1 1 1 1 1
11 2
1 0 0 0 0 0 0 0 0 0 1
6 3
0 0 0 0 0 0
3 6
9 9 9
```

Sample Output

```
9/10
0
0
0
```