Problem C. スターバースト・ストリーム

Time limit 5000 ms
Memory limit 512MB

Problem Description

On October 18, 2024, Kirito and his team fought against the Floor 74 boss, "The Gleam Eyes." Kirito used the dual swords "Elucidator" and "Dark Repulsor" to unleash a 16-hit combo and defeat the opponent.

Due to the immense power of the dual swords, the game developers imposed some restrictions on Kirito's abilities.

At any given time point, the critical hit probability of each sword is random. Let's assume that at time point i, the critical hit probability of "Elucidator" is p_i, and the critical hit probability of "Dark Repulsor" is q_i. At every time point, each sword can attack at most once. If both swords attack simultaneously and at least one sword lands a critical hit, the attack is considered a critical hit.

For example, if at time point i, $p_i = 0.5$ and $q_i = 0.3$:

1. If only "Elucidator" is used, the critical hit probability is 0.5.
2. If only "Dark Repulsor" is used, the critical hit probability is 0.3.
3. If both swords are used, the critical hit probability is 0.65.

Furthermore, the game limits the usage of "Elucidator" to at most x times and "Dark Repulsor" to at most y times.

As Kirito's companion, Klein, can you help Kirito calculate the maximum possible expected number of critical hits over n time points by optimally distributing the usage of the two swords?

Input format

The first line contains three integers n, x, and y ($1 \leq n \leq 50000$; $0 \leq x, y \leq n$) — the number of time points, the maximum number of times "Elucidator" can be used, and the maximum number of times "Dark Repulsor" can be used.

The second line contains n real numbers $p_1, p_2, \ldots, p_n$ ($0 \leq p_i \leq 1$), where p_i is the critical hit probability of "Elucidator" at each time point.

The third line contains n real numbers $q_1, q_2, \ldots, q_n$ ($0 \leq q_i \leq 1$), where q_i is the critical hit probability of "Dark Repulsor" at each time point.

All probabilities are given with exactly three decimal places.

Output format

Print the maximum possible expected number of critical hits. The answer is considered correct if its absolute or relative error does not exceed 10^{-4}.

Subtask score

Subtask	Score	Additional Constraints
1	3	$n \leq 5000,\ y = 0$
2	5	$y = 0$
3	13	$n \leq 500$
4	32	$n \leq 2000$
5	14	$n \leq 5000$
6	33	No additional constraints

Sample

Sample Input 1

```
3 2 2
0.000 1.000 0.500
1.000 0.000 0.500
```

Sample Output 1

```
2.750000000
```

Sample Input 2

```
4 2 2
0.168 0.020 0.000 1.000
0.000 1.000 0.874 0.824
```

Sample Output 2

```
3.042000000
```

Sample Input 3

```
9 7 3
0.295 0.017 0.687 0.949 0.210 0.456 0.991 0.381 0.016
0.990 0.511 0.968 0.492 0.594 0.964 0.589 0.842 0.271
```

Sample Output 3

```
5.726614000
```

Sample Input 4

```
5 2 0
1.000 0.000 0.747 0.002 0.986
0.552 0.000 1.000 0.818 0.207
```

Sample Output 4

```
1.986000000
```

Notes