beCP
2024
Task 1.3: Gift Exchange (gifts)

Author & Preparation: Zhiyi Luo

Time limit: 5 s Memory limit: 256 MB

Before heading off to IOI, you've decided to prepare some gifts to exchange with the other contestants. You have N types of gifts at home, and you have an unlimited supply of each type. Each gift type has its own *weight* and *value*. You want to maximize the total value of the gifts you bring.

However, there's a twist: the airline you're flying with has an unusual policy. They restrict the weight of your items by an strange rule: the *product* (*not the sum!*) of the weights of all your items must not exceed M.

Your task is to compute the maximum total value of the gifts you can carry without violating the airline's policy.

Input

The first line contains two integers N and M, denoting the number of different types of gifts you have and the largest allowed product of the weights, respectively.

The second line contains N integers a_1, a_2, ..., a_N, where a_i denotes the weight of the i-th type of gift.

The third line contains N integers b_1, b_2, ..., b_N, where b_i denotes the value of the i-th type of gift.

Important remark: Some numbers can exceed the capacity of a 32-bit number, so be sure to use `long long`.

Output

Print a single integer: The maximum value total of gifts you can bring without violating the airline's policy.

General limits

- $1 \leq N \leq 10^5$
- $1 \leq M \leq 10^{10}$
- $1 < a_i \leq M$ (for each i such that $1 \leq i \leq N$)
- $1 \leq b_i \leq 10^9$ (for each i such that $1 \leq i \leq N$)

Additional constraints

Subtask	Points	Constraints
A	20	$N \leq 5$
B	20	$N, M \leq 5000$
C	20	$M \leq 10^5$
D	40	No additional constraint.

Example 1

sample1.in

```
3 77
3 4 5
4 2 6
```

sample1.out

```
16
```

There are three types of gifts: type 1 has weight 3 and value 4, type 2 has weight 4 and value 2, and type 3 has weight 5 and value 6. The largest allowed product of the weights is 77.

It is optimal to bring one gift of type 1 and two gifts of type 3. Then the product of the weights is $3 \cdot 5 \cdot 5 = 75 \leq 77$, and the total value is $4 + 6 + 6 = 16$. There is no way to bring gifts with a higher total value.

Example 2

sample2.in

```
2 343
7 7
8 13
```

sample2.out

```
39
```

There two types of gifts: both have weight 7 and their values are 8 and 13. The largest allowed product is 343.

It is optimal to bring three gifts of the second type. The product is $7 \cdot 7 \cdot 7 = 343 \leq 343$, and the total value is $13 + 13 + 13 = 39$.