

# Problem

## Iridescent Universe 3

Time limit: 4 seconds

The Universe of Cup is where Little Cyan Fish lives. On the biggest planet in the universe, called Rainbow-Earth, everything is painted in one of  $k$  colors, numbered from 1 to  $k$ . Little Cyan Fish has  $n$  items, and the  $i$ -th item has color  $a_i$  and value  $b_i$ .

As the Chief Executive, Little Cyan Fish is preparing welcome gifts for the contestants of The 4th Universal Cup Finals. He loves a colorful world, so he wants to choose exactly  $k$  items, one of each color.

For some reason (perhaps because he likes the term, or simply because he does not know what else to ask you), Little Cyan Fish defines the *score* of a selection as the sum of the absolute differences between the values of every unordered pair of chosen items. Formally, for a set of chosen indices  $S \subseteq \{1, 2, \dots, n\}$  with  $|S| = k$  and  $\{a_i \mid i \in S\} = \{1, 2, \dots, k\}$ , its score is

$$\sum_{\substack{i, j \in S \\ i < j}} |b_i - b_j|.$$

Find the maximum possible score.

### Input

The first line contains two integers  $n$  and  $k$  ( $1 \leq n \leq 2 \times 10^5$ ,  $1 \leq k \leq \min(n, 2000)$ ), indicating the number of items and the number of colors, respectively.

The second line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $1 \leq a_i \leq k$ ), where  $a_i$  is the color of the  $i$ -th item.

The third line contains  $n$  integers  $b_1, b_2, \dots, b_n$  ( $0 \leq b_i \leq 10^9$ ), where  $b_i$  is the value of the  $i$ -th item.

It is guaranteed that every integer from 1 to  $k$  appears in array  $a$  at least once.

### Output

Output a single line containing a single integer, indicating the maximum possible score.

#### Sample Input 1

```
4 2
1 1 2 2
0 2 1 3
```

#### Sample Output 1

```
3
```

#### Sample Input 2

```
6 3
1 2 1 3 2 3
1 7 9 4 2 6
```

#### Sample Output 2

```
14
```

#### Sample Input 3

```
8 4
1 1 2 2 3 3 4 4
0 1 0 1 0 1 0 1
```

#### Sample Output 3

```
4
```

In the first sample test case, Little Cyan Fish can choose indices 1 and 4, giving a score of  $|0 - 3| = 3$ .

In the second sample test case, choosing indices 3, 5, and 4 gives values 9, 2, and 4, with a score of  $|9 - 2| + |9 - 4| + |2 - 4| = 14$ .

In the third sample test case, Little Cyan Fish can choose values 0, 0, 1, and 1, one from each color. The four pairs with different values each contribute 1, so the maximum score is 4.