On their way to the next World Finals, Mr. Ed and his pals are visiting the beautiful city of Moscow. One of their favorite tourism activities is buying souvenirs to bring back home, so they are looking for matryoshkas in a big artisan market close to the Red Square.

In the market, there is a very greedy and clever artisan that sells custom sets of matryoshkas. This artisan has n different matryoshkas in stock, each one having a unique identifier i ($1 \leq i \leq n$), a size s_i and a base price p_i. As the artisan is really clever, he offers a special deal to his clients:

Assume someone wants to buy the custom set $T = \{i_1, i_2, \ldots, i_n\}$ of m matryoshkas.

Let us call i_{max} to the identifier of the matryoshka with the maximum size and, in case there are multiple matryoshkas with maximum size, the maximum price in T, then the price one has to pay to buy T is

$$price(T) = \sum_{j=1}^{m} \frac{s_{i_j}}{s_{i_{max}}} \times p_{i_{max}}$$

Mr. Ed wants to exploit the artisan's deal buying exactly k matryoshkas, regardless which are the sizes of each matryoshka. Please determine the minimum number of money he needs to expend.

Input

The input will contain several test cases. The first line of each test case contains 2 space-separated integers n and k, representing the number of matryoshkas the artisan has in stock and the number of matryoshkas Mr. Ed wants to buy ($1 \leq n \leq 100,000$ and $1 \leq k \leq n$).

There will follow n lines. The i-th line contains 2 integers s_i and p_i, representing the size and the base price of the i-th matryoshka ($1 \leq s_i, p_i \leq 10^6$). There may be matryoshkas with the same s_i and p_i.

The last test case is followed by a single line containing 2 zeroes.

Output

For each case, print a single line with a real number with 6 digits after the decimal point representing the minimum price Mr. Ed has to pay to buy k matryoshkas (see format below).

Sample Input

```
3 2
10 5
4 4
6 3
0 0
```

Sample Output

```
Case #1: 5.000000
```