



Problem A. Alice in Wonderland

Ali is a CE student in Wonderland. The mayor of this city plans to establish k donut shops in the city, but this is not an easy task. The mayor has set a big reward for someone who can determine the best way to establish shops in the city. After reading the call for this competition, Ali begins to think...

The map of Wonderland is a coordinate axis from 0 to 255, where locations with high population densities are marked as a point r_i on this axis. The coordinates of these locations are always integers. The exact population of each point p_i is also specified.

The level of dissatisfaction of Wonderland's people is calculated as sum of squared errors. For example, assume there are k donut shops in locations v_1, v_2, \dots, v_k , and $p_i = 1$ for all i , the level of dissatisfaction of Wonderland's people is calculated as follows:

$$\sum_{i=1}^n \min_{j=1}^k (r_i - v_j)^2$$

Help Ali to find the minimum achievable dissatisfaction given the Wonderlands' map information.

Input

The first line of the input contains two integers d ($1 \leq d \leq 256$), the number of distinct points on map, and k ($1 \leq k \leq d$), the number of donut shops. The remaining d lines each contains two integers r ($0 \leq r \leq 255$) and p ($1 \leq p \leq 2^{26}$), where r is a points location and p is the number of people living there. Those d lines are given in increasing order of axis location.

Output

Display the level of dissatisfaction for an optimally chosen set of k points to place donut shops.

Examples

test	answer
2 1 50 20000 150 10000	66670000
2 2 50 20000 150 10000	0
4 2 0 30000 25 30000 50 30000 255 30000	37500000