7698 Postal Delivery

The postal service is interested in cutting costs as an alternative to raising the postage rates. One way to do this is by minimizing the distance traveled when delivering mail from the post office to all the required locations and returning to the post office. It may be that all the mail to be delivered does not fit on the mail truck at once, in which case the distance traveled by the truck must include travel back to the post office to reload. For simplicity, we assume a one dimensional world with the post office at the origin, and delivery locations each identified by a single coordinate. As an example, suppose a postal truck can carry up to 100 letters and that 50 letters need to be delivered to location −10, that 175 need to be delivered to location 10, and 20 delivered to location 25. A maximally efficient plan would be:

Deliver the 50 letters to location −10 (travel 2 * 10), the first 100 letters to location 10 (travel 2 * 10), the remaining 75 letters to location 10 while on the way to delivering the 20 to location 25 (travel 2 * 25). The total round-trip distance traveled is 90.

Input

The input file contains several test cases, each of them as described below.

The first line contains two integers, N and K, where $3 \leq N \leq 1000$ is the number of delivery addresses on the route, and $1 \leq K \leq 10000$ is the carrying capacity of the postal truck. Each of the following N lines will contain two integers x_j and t_j, the location of a delivery and the number of letters to deliver there, where $-1500 \leq x_1 < x_2 < \cdots < x_N \leq 1500$ and $1 \leq t_j \leq 800$ for all j. All delivery locations are nonzero (that is, none are at the post office).

Output

For each test case, on a line by itself, output the minimum total travel distance needed to deliver all the letters and return to the post office.

Sample Input

```
3 100
-10 50
10 175
25 20
5 3
-1002 800
-1001 800
-1000 800
-999 800
-998 800
```

Sample Output

```
90
2668000
```