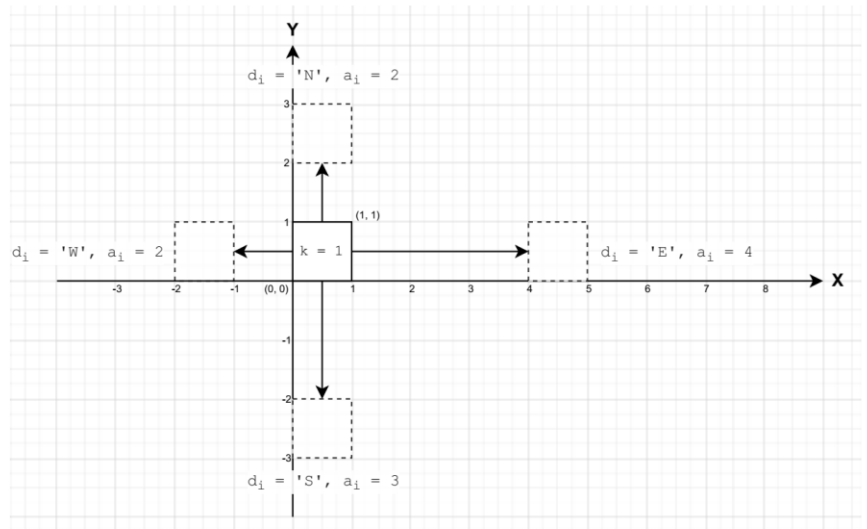




B. ROBOT

A coordinate plane is planned to be cleaned using a robot cleaner. The robot has a square shape of size $k \times k$, the edges are parallel to the coordinate axis. Initially, the lower left corner of the robot is at point $(0; 0)$, the upper right corner is at point $(k; k)$. Given a series of n movements on the plane, the i -th movement is characterized by the direction of movement, taking the values 'N' (up, increasing Y coordinate), 'S' (down, decreasing Y coordinate), 'W' (left, decreasing X coordinate) or 'E' (right, increasing X coordinate) and integer a_i - the distance the robot moves.



The robot cleans the entire area underneath it at any time. In other words, a point is considered clean if and only if it belongs to a square of size $k \times k$ in which the robot occupies at some time. Based on the given movements of the robot, calculate the total area of the entire cleaned surface.

INPUT

The first line contains two integers: the size of robot k and the number of movements n ($1 \leq k \leq 10^4$; $1 \leq n \leq 10^5$). The i -th line in the next n lines contains the direction of movement d_i and the distance of movement a_i (d_i - are the letters 'N', 'S', 'W' or 'E'; $1 \leq a_i \leq 10^9$)

OUTPUT

Print the total surface area cleaned by the robot.

Sample Input	Sample Output
1 5 E 2 N 2 W 4 S 4 E 4	17
3 4 W 2 N 1 W 1 N 2	27

