CCO '99 P1 - You Can't Get There From Here

Time limit: 2.0s **Memory limit:** 64M

Canadian Computing Competition: 1999 Stage 2, Day 1, Problem 1

In a primitive video game, a spot bounces around within a rectangular grid. The southwest corner of the grid has coordinates $(0, 0)$ and the northeast corner has coordinates (r, c) where $0 < r \leq 10$ and $0 < c \leq 10$. The southeast corner has coordinates $(0, c)$ and the northwest corner has coordinates $(r, 0)$. The spot always travels on the diagonal; that is, in one of the directions `NE`, `NW`, `SE`, `SW`. The outer edges of the grid serve as mirrors: after visiting a position on the edge of the grid the spot "bounces" off according to the normal rules of reflection (Snell's Law). For example, if the spot were travelling `NE` and hit the east edge of the grid, it would change direction to `NW`. If the spot were to hit the corner of the grid it would change to the opposite direction.

Given a grid size, two points A and B lying on the grid, and an initial direction, you are to determine if the spot moves from A to B and, if so, how far the spot moves (in terms of number of grid positions) before reaching B the first time.

Input Specification

The input consists of an integer n, followed by n data sets. Each data set begins with a line containing r and c, followed by two lines containing the coordinates of points A and B respectively, followed by one line containing `NE`, `NW`, `SE`, or `SW` - the initial direction of travel.

Output Specification

For each case, print a sentence as shown below indicating whether or not B can be reached, and, if it can, how far the spot moves before reaching B.

Sample Input

```
2
3 4
0 0
0 4
NE
4 2
3 1
3 2
NW
```

Sample Output

```
B can be reached from A after 12 move(s).
B cannot be reached from A.
```