Washington Distance (washington)

Ethan and George are in Washington D.C. for their favorite debate tournament's final round. To get to the venue, they need to use a taxi, and the driver expects the directions given according to the city's unique street system described below. The starting point and destination is an intersection of two streets.

The streets of Washington form a rectangular grid, which can be modeled as vertical and horizontal lines in the planar coordinate system. There is a street parallel to the Ox and Oy axis on each integer coordinate from -25 to 25. However, the streets are numbered in a very strange way. The city is divided into four quadrants: NW, SW, NE, SE (north-west, south-west, north-east, south-east), relative to the center of the city (which corresponds to the origin in the coordinate system).

- The vertical streets are identified by letters from A to Z. Street A goes through the center, and on both the eastern and western sides the streets are named B, C, ..., Z in the order of distance from the center.
- The horizontal streets are identified by numbers between 0 and 25. Street 0 goes through the center, and in both the northern and southern halves, the streets are numbered from the bottom to the top with increasing numbers from 1 to 25 (so the numbers reflect the remainder of the real coordinate when divided by 26).

See the image below for a better understanding.

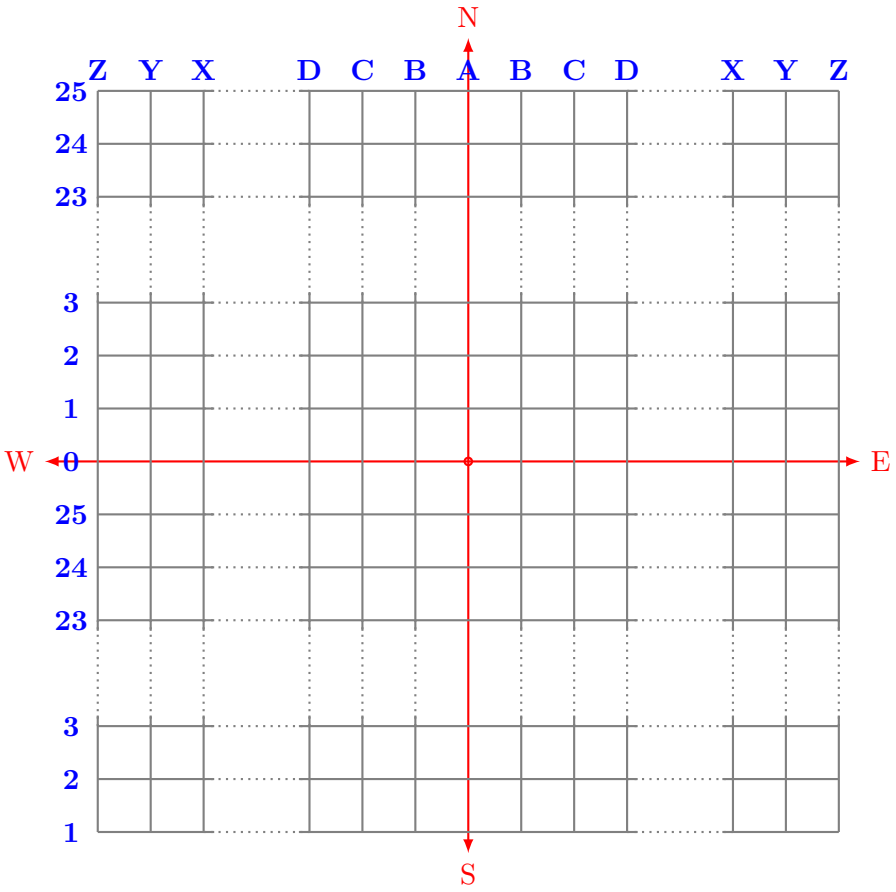


Figure 1: Map of Washington D.C.

Now, knowing this, Ethan and George want to know the distance between T pairs of points, according to the Washington coordinate system. The distance means the length of the ride with the taxi, which can only travel along the streets, given in units of the coordinate system.

> ☞ Among the attachments of this task you may find a template file `washington.*` with a sample incomplete implementation.

Input

The first line of the input contains T, the number of test cases.

The next T lines of the input contain two addresses according to the Washington coordinate system, given by their quadrant, street letter and street number.

Output

For each test case, you need to write a separate line with a single integer: the distance between the given two points.

Constraints

- $1 \leq T \leq 10\,000$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (20 points) All addresses are in the NE quadrant.

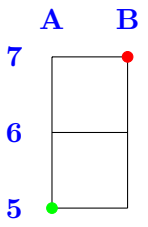
– **Subtask 3** (80 points) No additional limitations.

Examples

input	output
5 NE A 5 NE B 7 NE G 15 SW P 0 SE U 5 NW Q 10 NW A 19 SW B 3 SE Q 21 SW P 4	3 36 67 43 48

Explanation

In the **first sample case** the distance is 3. The situation is displayed in the image below:



In the **second sample case** the taxi driver does not have to cross street 0, but must cross street A. The distance between street G (corresponding to the starting point) and street A is 6. The distance between street P (corresponding to the end point) and street A is 15. So the total distance is $6 + 15 + 15 = 36$.

In the **third sample case** the taxi driver must cross both street 0 and street A. The distance between street U (corresponding to the starting point) and street A is 20. The distance between street Q (corresponding to the end point) and street A is 16. So the total distance is $20 + 16 + 21 + 10 = 67$ as the distance between street 5 (corresponding to the starting point) and street 0 is 21.