

Compass Conundrum

time limit per test: 1 second
memory limit per test: 976.6 megabytes
input: standard input
output: standard output

points: 100 · problem code: compass · author: inj

Your child is going off onto a hike, but you are worried that they are going to get lost, starve, and die. Even worse is that they do not understand how compass bearings work. You decide to create a program to convert from compass bearings to true bearings in order to help.

A compass bearing takes the form AdB , where A is one of N , S , and B is one of E and W , representing one of the four cardinal directions. d is an integer which states that the direction points d degrees away from A and towards B .

A true bearing takes the form cT , where $0 \leq c \leq 359$, meaning that the direction is c degrees from North in a clockwise direction.

Input

The input will be a line containing an integer n . The following n lines will each have a compass bearing for you to convert to true bearing.

Output

n lines, listing out the directions in true bearings.

Constraints

- $1 \leq n \leq 1000$
- $0 \leq d \leq 45$

Example 1

Input

```
5
N45E
S42W
N5W
S38E
N29W
```

```
45T
222T
355T
142T
331T
```