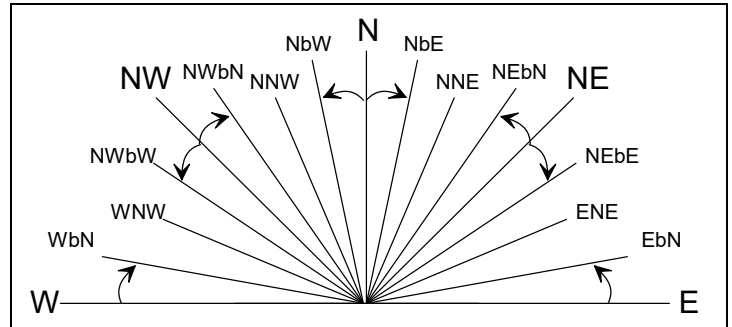


Problem 4 – Golf Pointers

Professor Plum is trying to teach his friend Professor East to play golf. Professor East can hit the ball along ways (300+ yards), so he likes to “cut dog-legs”, i.e., tee-off directly for the hole even if the fairway turns to the left or right. Professor East being unfamiliar with the course wants Professor Plum to specify a direction to the hole from the tee. Professor Plum would like to specify an angle from straight down the fairway at the tee, e.g., ‘20 degrees to the right’, or “15 degrees to the left.” Unfortunately, Professor East is not very good at angles, but being an “old navy man” would prefer a compass direction.

Professor Plum is familiar with the 4 *cardinal* directions (N,E,S,W) and the 8 *principal* compass directions: N, NE, E, SE, S, SW, W, NW. He is also familiar with the 16 compass directions: N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, NNW which have 22.5 degrees between them. To get a finer granularity, Professor East explains the 32 compass directions which includes 16 more compass directions between the original 16: N, NbE, NNE, NEbN, NE, NEbE, ENE, EbN, E, EbS, ESE, SEbE, SE, SEbS, SSE, SbE, S, SbW, SSW, SWbS, SW, SWbW, WSW, WbS, W, WbN, WNW, NWbW, NW, NWbN, NNW, NbW. The name XbY stands for “X by Y” which is short for “from principal direction X toward cardinal direction Y.”



Professor Plum doesn't think that 32 compass points is enough being 11.25 degrees apart, so he proposes adding 32 more compass points in between these labeled “XtY” short for X toward cardinal direction Y. Here the X's are the 16 original compass directions. From N to E in the clockwise direction the compass points are: N, NtE, NbE, NNEtN, NNE, NNEtE, NEbN, NEtN, NE, NEtE, NEbE, ENEtN, ENE, ENEtE, EbN, EtN, E.

Professor Plum wants you to write a program that takes inputs like ‘20 degrees to the right’ or ‘15 degrees to the left’ and determines the closed of the 64 compass points where N is always assumed to be straight down the fairway at the tee.

Input

The first line contains the number of directions to convert. Each of the following lines specifies a direction as “X degrees to the Y,” where X is an integer from 0 to 90 and Y is either “left” or “right.” The below sample input has 5 directions to convert.

```
5
20 degrees to the right
15 degrees to the left
0 degrees to the left
35 degrees to the left
18 degrees to the right
```

Output

For each direction, print to standard output a case label and the closed of the 64 compass points. For the example input given above, the output is:

```
Case 1: NNE
Case 2: NNWtN
Case 3: N
Case 4: NWbN
Case 5: NNEtN
```