

## 3866 How Do I Get Back HOME?

I drove all the way from my house to the contest site, so that I could carry out my divine duty as a contest judge. I printed out directions from my house to the contest, but forgot to print directions from the contest location back to my house! Your job is to generate (from the directions to the contest) the directions to get me back home.

The directions data has the following grammar:

$\langle directions \rangle$	=	$\langle start - instruction \rangle$ $\langle traveling - instruction - list \rangle$ $\langle end - instruction \rangle$
$\langle start - instruction \rangle$	=	Head $\langle compass \rangle$ from $\langle address \rangle$
$\langle end - instruction \rangle$	=	Arrive at $\langle address \rangle$
$\langle address \rangle$	=	$\langle number \rangle$ $\langle road \rangle$
$\langle traveling - instruction - list \rangle$	=	$\langle instruction \rangle$
$\langle traveling - instruction - list \rangle$	=	$\langle instruction \rangle$ $\langle instruction - list \rangle$
$\langle instruction \rangle$	=	Turn $\langle LR \rangle$ at $\langle road \rangle$
$\langle instruction \rangle$	=	Continue on $\langle road \rangle$
$\langle road \rangle$	=	$\langle word - list \rangle$
$\langle word - list \rangle$	=	$\langle word \rangle$
$\langle word - list \rangle$	=	$\langle word \rangle \langle word - list \rangle$
$\langle LR \rangle$	=	left
$\langle LR \rangle$	=	right
$\langle compass \rangle$	=	east
$\langle compass \rangle$	=	west
$\langle compass \rangle$	=	north
$\langle compass \rangle$	=	south
A $\langle number \rangle$ is an integer from 1 to 999999.		
A $\langle word \rangle$ is a string of letters and digits.		
A single space will separate words and numbers on a line.		

You may assume all roads are two-way, and have either a north-south, or an east-west orientation. An instruction reading “Continue on Elm St” means the road has changed its name to Elm St, but there is no change in the direction of travel.

### Input

The input will consist of one or more data sets. Each directions data set starts with a line containing one integer,  $n$  ( $2 < n < 100$  or  $n = 0$ ), being the total number of instructions. The next  $n$  lines each contain one instruction, and follow the grammar given above. An instruction line has less than 120 characters.

The last directions data set has  $n = 0$ , and should not be processed.

### Output

The output for each directions data set should begin with a line looking like

Directions  $\langle d \rangle$ :

where  $\langle d \rangle$  is the number of the data set, starting at 1. There should follow  $n$  output lines, each being one instruction.

There should be a blank line after each data set.

### Sample Input

```
7
Head north from 2357 Georgia Ave
Turn right at Bland Ave
Turn right at W Gentilly Rd
Turn left at GA67
Continue on Jones Lane Memorial Hwy
Turn right at E Main St
Arrive at 1 E Main St
8
Head east from 7532 Monroe St
Turn left at Everett St
Turn right at Government St
Continue on US98
Turn left at S Conception St
Continue on N Conception St
Turn right at Saint Louis St
Arrive at 154 Saint Louis St
0
```

### Sample Output

```
Directions 1:
Head north from 1 E Main St
Turn left at Jones Lane Memorial Hwy
Continue on GA67
Turn right at W Gentilly Rd
Turn left at Bland Ave
Turn left at Georgia Ave
Arrive at 2357 Georgia Ave

Directions 2:
Head west from 154 Saint Louis St
Turn left at N Conception St
Continue on S Conception St
Turn right at US98
Continue on Government St
Turn left at Everett St
Turn right at Monroe St
Arrive at 7532 Monroe St
```