## Movement Directions

You are given $n+1$ points $A_{0}, A_{1}, \ldots, A_{n}$ in the plane. First, you are asked to move from $A_{0}$ to $A_{1}$. Next, you will move through $A_{2}, A_{3}, \ldots, A_{n}$ along the line segments.

Compute the directions you will need to turn by and the values of the cosine of the turning angle for each of the points $A_{1}, A_{2}, \ldots, A_{n-1}$.

## Input data specification

In the first line, you are given one number $2<=n<=1000$, and in the each of the following $n+1$ lines, two integers:
$-1000<=x_{i} y_{\mathrm{i}}<=1000$ - the coordinates of the subsequent points.
You can assume that any two consecutive points are different.

## Output data specification

In $n-1$ consecutive lines, first print one letter $L$ (if you are turning left) or $R$ (if you are turning right), followed by a space and the value of the cosine of the turning angle with 6 digits' precision. If you do not turn at all but go forward at a particular point, please print just a letter F instead. Also, if you turn around and move back in the opposite direction, print only a letter B.

## Example 1

Input:
5
00
10
20
-2 0
-2 -2
04
Output:
F
B
L 0.000000
L -0.948683

## Scoring

By solving this problem you score 10 points.

