The *Stern-Brocot tree* is a beautiful way for constructing the set of all nonnegative fractions $\frac{m}{n}$ where $m$ and $n$ are relatively prime. The idea is to start with two fractions $\left(\frac{0}{1}, \frac{1}{0}\right)$ and then repeat the following operations as many times as desired:

Insert $\frac{m+m'}{n+n'}$ between two adjacent fractions $\frac{m}{n}$ and $\frac{m'}{n'}$ .

For example, the first step gives us one new entry between $\frac{0}{1}$ and $\frac{1}{0}$,

$$\frac{0}{1}, \frac{1}{1}, \frac{1}{0};$$

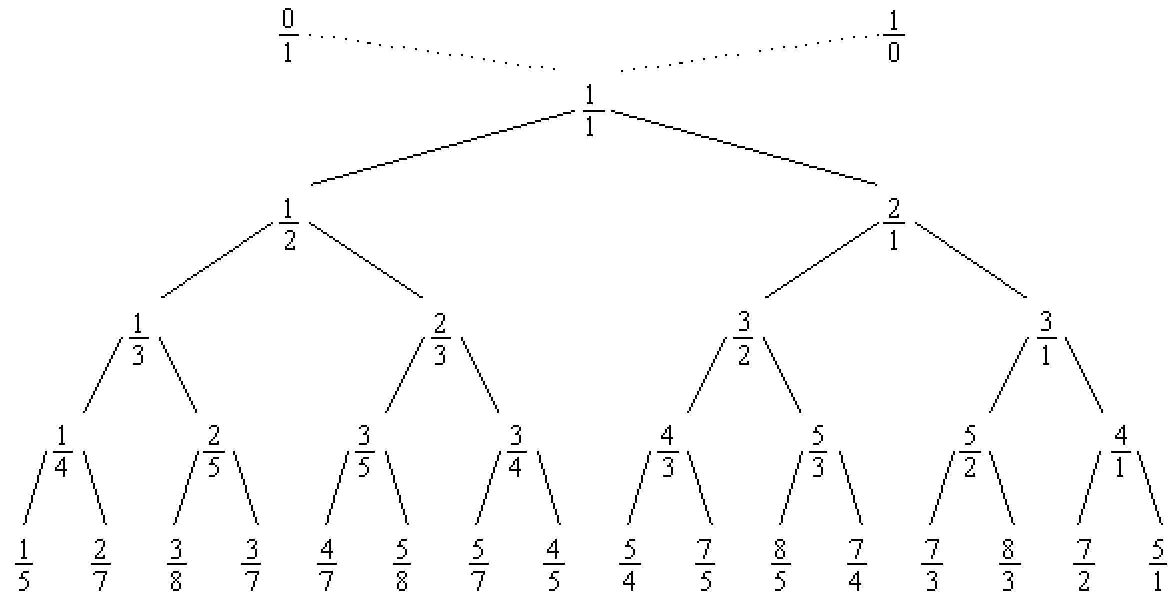
and the next gives two more:

$$\frac{0}{1}, \frac{1}{2}, \frac{1}{1}, \frac{2}{1}, \frac{1}{0}.$$

The next gives four more,

$$\frac{0}{1}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \frac{1}{1}, \frac{3}{2}, \frac{2}{1}, \frac{3}{1}, \frac{1}{0};$$

and then we will get 8, 16, and so on. The entire array can be regarded as an infinite binary tree structure whose top levels look like this:




The construction preserves order, and we couldn't possibly get the same fraction in two different places.

We can, in fact, regard the *Stern-Brocot tree* as a *number system* for representing rational numbers, because each positive, reduced fraction occurs exactly once. Let's use the letters '`L`' and '`R`' to stand for going down to the left or right branch as we proceed from the root of the tree to a particular fraction; then a string of `L`'s and `R`'s uniquely identifies a place in the tree. For example, `LRRL` means that we go left from $\frac{1}{1}$ down to $\frac{1}{2}$, then right to $\frac{2}{3}$, then right to $\frac{3}{4}$, then left to $\frac{5}{7}$. We can consider LRRL to be a representation of $\frac{5}{7}$. Every positive fraction gets represented in this way as a unique string of `L`'s and `R`'s.

Well, actually there's a slight problem: The fraction $\frac{1}{1}$ corresponds to the empty string, and we need a notation for that. Let's agree to call it $I$, because that looks something like 1 and it stands for "identity".

In this problem, given a positive rational fraction, you are expected to represent it in *Stern-Brocot number system.*

## Input

The input file contains multiple test cases. Each test case consists of a line contains two positive integers $m$ and $n$ where $m$ and $n$ are relatively prime. The input terminates with a test case containing two `1`'s for $m$ and $n$, and this case must not be processed.

## Output

For each test case in the input file output a line containing the representation of the given fraction in the *Stern-Brocot number system.*

## Sample Input

```
5 7
878 323
1 1
```

## Sample Output

```
LRRL
RRLRRLRLLLLRLRRR
```