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Counter game

by dheeraj

Problem

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Louise and Richard play a game. They have a counter set to N . Louise gets the first turn and the turns alternate thereafter. In the game, they perform the following operations.

- If N is not a power of 2, reduce the counter by the largest power of 2 less than N .
- If N is a power of 2, reduce the counter by half of N .
- The resultant value is the new N which is again used for subsequent operations.

The game ends when the counter reduces to 1, i.e., $N == 1$, and the last person to make a valid move wins.

Given N , your task is to find the winner of the game.

Update If they set counter to 1, Richard wins, because its Louise' turn and she cannot make a move.

Input Format

The first line contains an integer T , the number of testcases.

T lines follow. Each line contains N , the initial number set in the counter.

Constraints

$$1 \leq T \leq 10$$

$$1 \leq N \leq 2^{64} - 1$$

Note: Range of N is larger than `long long int`, consider using `unsigned long long int`.

Output Format

For each test case, print the winner's name in a new line. So if Louise wins the game, print "Louise". Otherwise, print "Richard". (Quotes are for clarity)

Sample Input

```
1
6
```

Sample Output

```
Richard
```

Explanation

- As 6 is not a power of 2, Louise reduces the largest power of 2 less than 6 i.e., 4, and hence the counter reduces to 2.
- As 2 is a power of 2, Richard reduces the counter by half of 2 i.e., 1. Hence the counter reduces to 1.


As we reach the terminating condition with $N == 1$, Richard wins the game.


Submissions: 6046

Max Score: 30

Difficulty: Difficult

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Java 7  

```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named
           Solution. */
11     }
12 }
```

Line: 1 Col: 1

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