

Problem

Submissions

Leaderboard

Discussions

Editorial

Louise and Richard have developed a numbers game. They pick a number and check to see if it is a power of **2**. If it is, they divide it by **2**. If not, they reduce it by the next lower number which is a power of **2**. Whoever reduces the number to **1** wins the game. Louise always starts.

Given an initial value, determine who wins the game.

Example

$n = 132$

It's Louise's turn first. She determines that **132** is not a power of **2**. The next lower power of **2** is **128**, so she subtracts that from **132** and passes **4** to Richard. **4** is a power of **2**, so Richard divides it by **2** and passes **2** to Louise. Likewise, **2** is a power so she divides it by **2** and reaches **1**. She wins the game.

**Update** If they initially set counter to **1**, Richard wins. Louise cannot make a move so she loses.

Function Description

Complete the counterGame function in the editor below.

counterGame has the following parameter(s):

- int n: the initial game counter value

Returns

- string: either Richard or Louise

Input Format

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

Each of the next  $t$  lines contains an integer  $n$ , the initial value for each game.

Constraints

- $1 \leq t \leq 10$
- $1 \leq n \leq 2^{64} - 1$

Sample Input

```
1
6
```

Sample Output

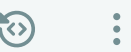
```
Richard
```

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.

Change Theme Language Python 3



```
1  #!/bin/python3
2
3  import math
4  import os
5  import random
6  import re
7  import sys
8
9  #
10 # Complete the 'counterGame' function below.
11 #
12 # The function is expected to return a STRING.
13 # The function accepts LONG_INTEGER n as parameter.
14 #
15
16 def smaller_power(number, result=1):
17     while result < number:
18         result *= 2
19
20     result /= 2
21     return result
22
23 def counterGame(n):
24     turn = 0
25
26     while n != 1:
27         if n % 2 == 0:
28             n /= 2
29
30         else:
31             n -= smaller_power(n)
32
33     turn += 1
34
35
36     return 'Louise' if turn % 2 != 0 else 'Richard'
37
38
39
40
```

Line: 42 Col: 5

Upload Code as File Test against custom input

Run Code

Submit Code

## Congratulations

You solved this challenge. Would you like to challenge your friends?



Test case 0

Test case 1

Test case 2

Test case 3

Test case 4

Test case 5

Compiler Message

Success

Input (stdin)

Download

```
1 1
2 6
```

Expected Output

Download

```
1 Richard
```