



Xor-sequence

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Problem

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An array, A , is defined as follows:

- $A_0 = 0$
- $A_x = A_{x-1} \oplus x$ for $x > 0$, where \oplus is the symbol for XOR

You must answer Q questions. Each i^{th} question, is in the form $L_i R_i$, and the answer is $A_{L_i} \oplus A_{L_i+1} \oplus \dots \oplus A_{R_i-1} \oplus A_{R_i}$ (the *Xor-Sum* of segment $[L_i, R_i]$).

Print the answer to each question.

Input Format

The first line contains Q (the number of questions).

The Q subsequent lines each contain two space separated integers, L and R , respectively. Line contains L_i and R_i .

Constraints

$$1 \leq Q \leq 10^5$$

$$1 \leq L_i \leq R_i \leq 10^{15}$$

Subtasks

For 50% score: $1 \leq L_i \leq R_i \leq 10^5$

Output Format

On a new line for each test case i , print the *exclusive-or* of A 's elements in the inclusive range between indices L_i and R_i .

Sample Input

```
3
2 4
2 8
5 9
```

Sample Output

```
7
9
15
```

Explanation

The beginning of our array looks like this: $A = [0, 1, 3, 0, 4, 1, 7, 0, 8, 1, 11, \dots]$

Test Case 0:

$$3 \oplus 0 \oplus 4 = 7$$

Test Case 1:

$$3 \oplus 0 \oplus 4 \oplus 1 \oplus 7 \oplus 0 \oplus 8 = 9$$

Test Case 2:

$$1 \oplus 7 \oplus 0 \oplus 8 \oplus 1 = 15$$

[f](#) [t](#) [in](#)

Submissions: [5974](#)



Max Score: 40

Difficulty: Medium

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Current Buffer (saved locally, editable)  

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         Scanner in = new Scanner(System.in);
11         int Q = in.nextInt();
12         for(int a0 = 0; a0 < Q; a0++){
13             long L = in.nextLong();
14             long R = in.nextLong();
15         }
16     }
17 }
18
```

Line: 1 Col: 1

 [Upload Code as File](#) ☐ Test against custom input

Run Code

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