Xor-sequence

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 will be given a left and right index l r. You must determine the XOR sum of the segment of A as $A[l] \oplus A[l+1] \oplus \ldots \oplus A[r-1] \oplus A[r]$.

For example, $A = [0, 1, 3, 0, 4, 1, 7, 0, 8]$. The segment from $l = 1$ to $r = 4$ sums to $1 \oplus 3 \oplus 0 \oplus 4 = 6$.

Print the answer to each question.

Function Description

Complete the *xorSequence* function in the editor below. It should return the integer value calculated.

xorSequence has the following parameter(s):

- *l*: the lower index of the range to sum

- *r*: the higher index of the range to sum

Input Format

The first line contains an integer q, the number of questions.
Each of the next q lines contains two space-separated integers, $l[i]$ and $r[i]$, the inclusive left and right indexes of the segment to query.
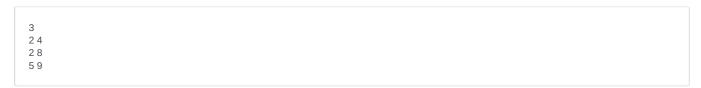
Constraints
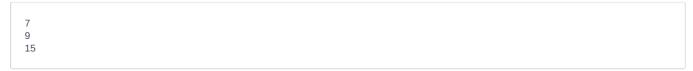
$1 \le q \le 10^5$
$1 \le l[i] \le r[i] \le 10^1 5$

Output Format

On a new line for each test case, print the *XOR-Sum* of A's elements in the inclusive range between indices $l[i]$ and $r[i]$.

Sample Input 0

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

Sample Output 0

```
7
9
15
```

Explanation 0

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

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:

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

Sample Input 1

```
3
3 5
4 6
15 20
```

Sample Output 1

```
5
2
22
```

Explanation 1

$A = [0, 1, 3, 0, 4, 1, 7, 0, 8, 1, 11, 0, 12, 1, 15, 0, 16, 1, 19, 0, 20, 1, 23, 0, 24, 1, \ldots]$. Perform the xor sum on each interval:

$3 - 5 : 0 \oplus 4 \oplus 1 = 5$
$4 - 6 : 4 \oplus 1 \oplus 7 = 2$
$15 - 20 : 0 \oplus 16 \oplus 1 \oplus 19 \oplus 0 \oplus 20 = 22$