XOR

Given two integers S and F, what is the XOR (exclusive-or) of all numbers between S and F (inclusive)?

Input Specification

The first line of input is the integer T, which is the number of test cases $(1 \leq T \leq 1000)$. T lines follow, with each line containing two integers S and F $(1 \leq S \leq F \leq 1\,000\,000\,000)$.

Output Specification

For each test case, output the (decimal) value of the XOR of all numbers between S and F, inclusive.

Sample Input

```
5
3 10
5 5
13 42
666 1337
1234567 89101112
```

Output for Sample Input

```
8
5
39
0
89998783
```