Counting Problem

Time limit: 1.0s **Memory limit:** 256M

Given two integers N and M, count the number of ordered pairs of integers (x, y) in the range $[1, N)$ such that $x + y \geq N$ and $x \oplus y \leq M$. Since the answer may be very large, output it modulo $10^9 + 7$.

There will be T such test cases.

Constraints

$1 \leq T \leq 10^4$

$2 \leq N \leq 10^{18}$

$0 \leq M \leq 10^{18}$

Input Specification

The first line contains an integer T.

The new T line contains two integers, N and M.

Output Specification

Output a single integer, the number of pairs modulo $10^9 + 7$.

Sample Input

```
1
5 6
```

Sample Output

```
8
```

Explanation for Sample

The pairs are $(1, 4)$, $(2, 3)$, $(2, 4)$, $(3, 2)$, $(3, 3)$, $(4, 1)$, $(4, 2)$, $(4, 4)$.