Xor Sum

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Determine whether there exists a sequence of N nonnegative integers $a_1, a_2, \cdots, a_N$ that satisfies all of the following conditions, and if it exists, find the minimum possible value of the maximum of the array.

- $a_1 + a_2 + \cdots + a_N = S$
- $a_1 \oplus a_2 \oplus \cdots \oplus a_N = X$ (Here $\oplus$ denotes bitwise xor operation)

Note that there are T tests in one input file.

Input

Input is given from Standard Input in the following format:

T

N_1 S_1 X_1

N_2 S_2 X_2

$\vdots$

N_T S_T X_T

Here, N_i, S_i, X_i represent values of N, S, X for the i-th test, respectively.

Constraints:

- $1 \leq T \leq 500$
- $1 \leq N \leq 2^{60} - 1$
- $0 \leq S \leq 2^{60} - 1$
- $0 \leq X \leq 2^{60} - 1$
- All values in input are integers.

Output

Print T lines. In the i-th line, print -1 if there doesn't exist an array with the mentioned property in the i-th test, and print the minimum possible value of the maximum of the array if it exists.

Example

standard input	standard output
6 3 9 3 4 8 0 6 19 1 1 15 15 2 6 5 5 4 3	3 2 4 15 -1 -1

Note

The following is a solution for each test:

- (3,3,3)
- (2,2,2,2)
- (2,3,3,3,4,4)
- (15)
- Impossible
- Impossible