

Problem 1:

One hot summer day Pete and his friend Billy decided to buy a watermelon. They chose the biggest and the ripest one, in their opinion. After that the watermelon was weighed, and the scales showed w kilos. They rushed home, dying of thirst, and decided to divide the berry, however they faced a hard problem. Pete and Billy are great fans of even numbers, that's why they want to divide the watermelon in such a way that each of the two parts weighs even number of kilos, at the same time it is not obligatory that the parts are equal. The boys are extremely tired and want to start their meal as soon as possible, that's why you should help them and find out, if they can divide the watermelon in the way they want. For sure, each of them should get a part of positive weight.

Input

The first (and the only) input line contains integer number w ($1 \leq w \leq 100$) — the weight of the watermelon bought by the boys.

Output

Print YES, if the boys can divide the watermelon into two parts, each of them weighing even number of kilos; and NO in the opposite case.

Examples

Input

Copy

8

Output

Copy

YES

Note

For example, the boys can divide the watermelon into two parts of 2 and 6 kilos respectively (another variant — two parts of 4 and 4 kilos).

Problem 2: Reverse File Content

Given a filename, print the lines in reverse order.

Input:

Filename.

Output:

Reversed file content.:

Problem 3

For a positive integer n let's define a function f :

$$f(n) = -1 + 2 - 3 + \dots + (-1)^n n$$

Your task is to calculate $f(n)$ for a given integer n .

Input

The single line contains the positive integer n ($1 \leq n \leq 10^{15}$).

Output

Print $f(n)$ in a single line.

Examples

Input

4

Output

2

Input

5

Output

-3

Note

$$f(4) = -1 + 2 - 3 + 4 = 2$$

$$f(5) = -1 + 2 - 3 + 4 - 5 = -3$$

Problem 4

You are given two positive integers a and b . In one move you can increase a by 1 (replace a with $a+1$). Your task is to find the minimum number of moves you need to do in order to make a divisible by b . It is possible, that you have to make 0 moves, as a is already divisible by b . You have to answer t independent test cases.

Input

The first line of the input contains one integer t ($1 \leq t \leq 104$) — the number of test cases. Then t test cases follow.

The only line of the test case contains two integers a and b ($1 \leq a, b \leq 109$).

Output

For each test case print the answer — the minimum number of moves you need to do in order to make a divisible by b

.

Example

Input

5

10 4
13 9
100 13
123 456
92 46

Output

2
5
4
333
0