Problem L. List

Source file name:	List.c, List.cpp, List.java, List.py
Input:	`Standard`
Output:	`Standard`
Time / Memory limit:	`5/8/8 (C++/Java/Python) second(s) / 128 megabytes`
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Initially, you have an empty list and are given several queries. These queries are basic operations that can be performed on the *List* data structure, such as `Insert` (insert an element into the list) and `Delete` (remove the first occurrence of an element from the list, if it exists). At any moment, it's also necessary to know the value of the **median** of the integers currently in the list. The task is to process the given queries.

In statistics, the **median** is the number located in the middle position of a list of numbers when they are sorted in ascending order, leaving the same number of values on both sides. In the case of a list with an even length, the median is the average of the two middle numbers.

Input

The input contains a single test case. The first line contains a positive integer Q $\left(1 \leq Q \leq 2 \cdot 10^6\right)$ denoting the number of queries to process, followed by exactly Q lines in the following format:

- 1 V: `Insert` operation with V $\left(0 \leq V \leq 10^6\right)$, inserts the integer V into the list.
- 2 V: `Delete` operation with V $\left(0 \leq V \leq 10^6\right)$, removes the first occurrence of the integer V from the list if it exists. If the list is empty, nothing happens.
- 3: Print on a single line the integer part of the median of the integers currently in the list. If the list is empty, print the message: `Empty!`

Output

For each query of type 3, compute and print on a single line the integer part of the median of the integers currently in the list. If the list is empty, print the message: `Empty!`

Example

Input	Output
12 3 2 5 1 10 1 10 3 2 10 3 1 25 1 20 3 1 25 3	Empty! 10 10 20 22

Use fast I/O methods