Problem C

Powers of Two

Adrian has learned addition and subtraction from Morgan and is now ready to learn a new concept, the powers of two. Powers of two are integers in the form of 2^x, where $x \geq 0$. Some examples of powers of two are $1, 2, 4, 8, \ldots$.

To ensure Adrian understands this new concept, Morgan prepares a challenge for him. At first, Adrian is given an integer $N = 0$. Then, Morgan will give him Q queries. Each query can be one of the following types:

- + x, which will add the value of N by 2^x, or
- - x, which will subtract the value of N by 2^x.

Adrian is instructed to clap his hands whenever N becomes 0 after each query.

Adrian finds this challenge is very hard to follow. He asks you whether he should clap or not after each query.

Input

Input begins with an integer Q ($1 \leq Q \leq 200\,000$) representing the number of queries. Each of the next Q lines contains a character and an integer T x ($T \in \{$ +, - $\}$; $0 \leq x \leq 200\,000$) representing the query.

Output

After each query, output `YES` in a single line if the value of N becomes 0, or output `NO` otherwise.

Sample Input #1

```
6
+ 3
+ 3
- 4
- 6
+ 7
- 6
```

Sample Output #1

```
NO
NO
YES
NO
```

```
NO
YES
```

Explanation for the sample input/output #1

The value of N after each query is 8, 16, 0, -64, 64, and 0. Therefore, Adrian should clap after query 3 and 6.

Sample Input #2

```
13
+ 13324
+ 5773
- 5772
+ 13324
+ 0
- 5772
- 13325
- 0
+ 0
+ 0
- 200000
- 1
+ 200000
```

Sample Output #2

```
NO
NO
NO
NO
NO
NO
NO
YES
NO
NO
NO
NO
YES
```