John Baptist likes words. In fact, he likes them so much that he keeps a *word list*, containing every word he likes! However, sometimes he stops liking a word, so he erases it from the list. From time to time, he thinks of a new word, and wonders how many words in the list start with that word. Counting one by one in the *word list* can be very boring (and he ain't got time for it, there's a new canoe to be built) - can you help him with it?

You will be given q queries ($1 \leq q \leq 10^6$), which can be of the following types:

- `1 s` – Add a string s of lowercase characters to the *word list*
- `2 s` – Remove the string s from the *word* list
- `3 s` – Count the number of words in the list (up to that time) that contain s as a prefix.

At the beginning, the word list is empty. For each query of type 3, output an integer, representing the result of this query in a single line (see the samples for any clarifications).

Input

The first line contains one integer q ($1 \leq q \leq 10^6$).
Next q lines contain one integer t ($1 \leq t \leq 3$) and one string s ($1 \leq |s| \leq 10^6$), representing the type of query and the string to be queried.
It's guaranteed that the sum of lengths of all strings will be less than 10^5, all the strings to be deleted were given before and there will be at least one query of type 3.

Output

For each query of type `3`, output a single integer: the ammount of strings in the current word list which have s as a prefix. Remember: the order of queries is important!

Samples

Input	Output
5 1 algorithms 1 algorithm 3 alg 2 algorithm 3 alg	2 1
4 1 antony 1 fakhoury 1 john 3 baptist	0

Explanation

On the first sample, the word list after each query is the following:
`1: {"algorithms"}` - `"algorithms"` was added
`2: {"algorithm", "algorithms"}` - `"algorithm"` was added
`3: {"algorithm", "algorithms"}` - both `"algorithm"` and `"algorithms"` have `"alg"` as prefix, so print 2
`4: {"algorithms"}` – `"algorithm"` was removed from the list
`5: {"algorithms"}` - the only word in the list, `"algorithms"`, has `"alg"` as prefix, so print 1.