Hipsters

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Inspired by the Online Encyclopedia of Integer Sequences, Ivancho decided to create a website devoted only to integers. There people can say which integer they like and which one they don't like anymore. the website become so popular that a whole culture has risen in it. Especially interesting are the integer hipsters, who search for such integers that they are as "unique" as possible. From time to time they ask Ivancho what the sum of aesthetic distance between any number and all others at some moment is.

The **aesthetic distance** between two integers A and B is equal to the minimal number of removals of the last (rightmost) digit of A and additions of a digit at the end of A, after which A=B. For example, the aesthetic distance between 123 and 1248 is 3 (123 -> 12 -> 124 -> 1248).

Ivancho answered their questions manually, but once, by accident, he erased his whole database! Since he hadn't saved a backup of the database, he was in despair. Make a program, which can automatically answer these questions, before Ivancho has given up on his website. Your program must find the sum of aesthetic distances between integers and all other integers that have been liked until now.

Input

From the first line of hipsters.in the program must read the integer Q - the number of queries.

From the i-th of the next Q lines, the integers t[i] and n[i] are read. t[i] is the query type: if t[i] is equal to 1, it is a question about what the aesthetic distance between n[i] and all other integers is. If t[i] is equal to 2, the integer n[i] has been liked by a person, and if t[i] is equal to 3, then one person does not like n[i] anymore.

*It is guaranteed that if t[i]=3, then n[i] has been liked by at least one person so far.

*It is possible that at one point, an integer can be the favourite of more than one person. In that case, the number is counted more than once.

Output

In hipsters.out the program must write as many integers as there are queries of type 1 (i.e. where t[i]=1). Of course, each integer must be the answer of the corresponding query.

Constraints:

$1 \leq Q \leq 200\ 000$

$0 \leq n[i] < 100\ 000\ 000\ (10^8)$

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Example tests

Input (hipsters.in)	Output (hipsters.out)
8 2 123 2 124 2 1234 1 1248 2 1234 3 124 1 1248 1 0	8 11 11
5 1 88888888 2 99999999 2 100 1 0 1 98999999	0 11 25

Explanation of the first example

First query of type 1 (n[i] = 1248):

```
 123 ->   12 -> 124 -> 1248 (3)
 124 -> 1248 (1)
1234 ->  123 ->  12 ->  124 -> 1248 (4)
```

Second query of type 1 (again n[i] = 1248):

```
 123 ->  12 -> 124 -> 1248 (3)
1234 -> 123 ->  12 ->  124 -> 1248 (4)
1234 -> 123 ->  12 ->  124 -> 1248 (4)
```

Third query of type 1 (n[i] = 0):

```
 123 ->  12 ->  1 -> 0 (3)
1234 -> 123 -> 12 -> 1 -> 0 (4)
1234 -> 123 -> 12 -> 1 -> 0 (4)
```