Hash it!

Your task is to calculate the result of the hashing process in a table of 101 elements, containing keys that are strings of length at most 15 letters (ASCII codes 'A',...,'z'). Implement the following operations:

- find the index of the element defined by the key (ignore, if no such element),
- insert a new key into the table (ignore insertion of the key that already exists),
- delete a key from the table (without moving the others), by marking the position in table as *empty* (ignore non-existing keys in the table)

When performing find, insert and delete operations define the following function:
integer Hash(string key),
which for a string $key = a_1...a_n$ returns the value:
Hash(key)=h(key) mod 101, where
h(key)=19 $*$(ASCII(a_1)$*$1+...+ASCII(a_n)$*n$).
Resolve collisions using the open addressing method, i.e. try to insert the key into the table at the first free position: (*Hash*(key)+j^2+23$*j$) mod 101, for j=1,...,19. After examining of at least 20 table entries, we assume that the insert operation cannot be performed.

Input

t [the number of test cases <= 100]
n_1 [the number of operations (one per line)[<= 1000]
ADD:string
[or]
DEL:string [other test cases, without empty lines betwee series]

Output

For every test case you have to create a new table, insert or delete keys, and write to the output:
the number of keys in the table [first line]
index:key [sorted by indices]

Example

Input:
1
11
ADD:marsz
ADD:marsz
ADD:Dabrowski
ADD:z
ADD:ziemii
ADD:wloskiej
ADD:do
ADD:Polski
DEL:od
DEL:do

DEL:wloskiej

Output:
5
34:Dabrowski
46:Polski
63:marsz
76:ziemii
96:z