

Recall

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	1024 megabytes

There is an initially empty stack S . A sequence of operations is then performed on it. There are three types of operations:

- `" + x "` means pushing the element x onto the stack.
- `" ? x "` means querying whether the element x exists in the stack. There are two possible results:
 - `" T x "` means that the element x exists.
 - `" F x "` means that the element x does not exist.
- `" - "` means popping the top element from the stack (the stack must be nonempty).

Little G recorded all `" + x "` `" T x "` and `" F x "` operations during the entire process, but did not record any `" - "` operations.

Now, Little G wants to insert some `" - "` operations into the recorded operation sequence such that:

- At all times, all elements in the stack are distinct.
- The results of all `" ? x "` queries are consistent with the operation sequence you construct.

It is guaranteed that at least one valid reconstructed sequence exists.

Input

There are multiple test cases.

The first line of the input contains an integer T ($1 \leq T \leq 10^5$), representing the number of test cases. Each test case is described as follows:

For each test case:

- The first line contains a positive integer n ($1 \leq n \leq 10^6$).
- Each of the next n lines is in the form `" + x "` `" T x "` or `" F x "` representing a recorded operation. It is guaranteed that $1 \leq x \leq 10^9$.

It is guaranteed that $1 \leq \sum n \leq 10^6$.

Output

For each test case, output one line containing a string consisting only of the characters `" + "` `" ? "` and `" - "` representing the operation sequence you reconstruct, where:

- If the i -th character is `" + "` then the i -th operation in your reconstructed sequence pushes an element onto the stack.
- If the i -th character is `" ? "` then the i -th operation in your reconstructed sequence queries whether an element exists in the stack.
- If the i -th character is `" - "` then the i -th operation in your reconstructed sequence pops the top element from the stack.

If there are multiple possible original operation sequences, you may reconstruct any one of them.

Example

standard input	standard output
2	+ - + ? - ?
4	++ ? ? ? -- + -
+ 1	
+ 1	
T 1	
F 1	
6	
+ 1	
+ 2	
T 1	
F 3	
T 2	
+ 2	