Problem 2. Shopping List

It's the end of the week and it is time for you to go shopping, so you need to create a shopping list first.

Input

You will receive an initial list with groceries separated by "!".

After that you will be receiving 4 types of commands, until you receive "Go Shopping!"

- Urgent {item} add the item at the start of the list. If the item already exists, skip this command.
- Unnecessary {item} remove the item with the given name, only if it exists in the list. Otherwise skip this command.
- Correct {oldItem} {newItem} if the item with the given old name exists, change its name with the **new** one. If it **doesn't exist**, skip this command.
- Rearrange {item} if the grocery exists in the list, remove it from its current position and add it at the end of the list.

Constraints

There won't be any duplicate items in the initial list

Output

Print the list with all the groceries, joined by ", ".

"{firstGrocery}, {secondGrocery}, ...{nthGrocery}"

Examples

Input	Output
Tomatoes!Potatoes!Bread	Tomatoes, Potatoes, Bread
Unnecessary Milk	
Urgent Tomatoes	
Go Shopping!	
Input	Output
Milk!Pepper!Salt!Water!Banana	Milk, Onion, Salt, Water, Banana
Urgent Salt	
Unnecessary Grapes	
Correct Pepper Onion	
Rearrange Grapes	
Correct Tomatoes Potatoes	
Go Shopping!	



























