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 Unnecessary Milk Urgent Tomatoes Go Shopping!	Tomatoes, Potatoes, Bread

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