

Problem 2. Santa's List

Its Christmas time and Santa needs your help with creating the list of noisy kids.

Input

You will receive the **initial list** with noisy kids each of them separated with "&".

After that you will receive **4 types** of commands until you receive "**Finished!**"

- **Bad {kidName}** - **adds** a kid at the **start** of the list. If the kid **already exists** skip this line.
- **Good {kidName}** - **removes** the kid with the given name only **if he exists** in the list, otherwise skip this line.
- **Rename {oldName} {newName}** – if the kid with the given **old name** exists **change** his name with the **newer** one. If he **doesn't exist** skip this line.
- **Rearrange {kidName}** - If the kid exists in the list **remove** him from his **current position** and **add** him at the **end** of the list.

Constraints

- You won't receive duplicate names in the initial list

Output

Print the **list** of all noisy kids joined by ", ".

- "{firstKid}, {secondKid}, ...{nthKid}"

Examples

Input	Output
Peter&George&Mike Bad Joshua Good Peter Finished!	Joshua, George, Mike
Input	Output
Joshua&Aaron&Walt&Dustin&William Good Walt Bad Jon Rename Aaron Paul Rearrange Jon	Joshua, Paul, Dustin, William, Jon

Rename Peter George Finished!	
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