ForceBook

The force users are struggling to remember which side are the different forceUsers from, because they switch them too often. So you are tasked to create a web application to manage their profiles.

You should store information for every **unique forceUser**, registered in the application.

You will receive **several input lines** in one of the following formats:

{forceSide} | {forceUser}

{forceUser} -> {forceSide}

The `forceUser and forceSide` are strings, containing **any** character.

If you receive **forceSide | forceUser** you should **check if such forceUser already exists**, and **if not** - **add** him/her to the corresponding side.

If you receive a `forceUser -> forceSide` you should check if there is such **forceUser** already and if so, **change his/her side**. If there is no such **forceUser**, add him/her to the corresponding **forceSide**, treating the command **as new registered forceUser.**
Then you should print on the console: "{forceUser} joins the {forceSide} side!"

You should end your program when you receive the command **"Lumpawaroo"**. At that point you should print each force side, **ordered descending by forceUsers count, than ordered by name**. For each side print the **forceUsers**, **ordered by name**.

In case there are **no forceUsers in a side**, you **shouldn't print** the side information.

Input / Constraints

- The input comes in the form of commands in one of the formats specified above
- The input ends when you receive the command **"Lumpawaroo"**

Output

- As output for each forceSide, **ordered descending by forceUsers count**, **then by name**, you must print all the forceUsers, **ordered by name alphabetically**
- The output format is:

    Side: {forceSide}, Members: {forceUsers.Count}

    ! {forceUser}

    ! {forceUser}

    ! {forceUser}

- In case there are **NO forceUsers**, don't print this side

Examples

Input	Output	Comments

Light | Gosho
Dark | Pesho
Lumpawaroo
	`Side: Dark, Members: 1`
	`! Pesho`
	`Side: Light, Members: 1`
	`! Gosho`
		We register Gosho in the Light side and Pesho in the Dark side. After receiving "Lumpawaroo", we print both sides, ordered by membersCount and then by name.

Lighter | Royal
Darker | DCay
Ivan Ivanov -> Lighter
DCay -> Lighter
Lumpawaroo
	`Ivan Ivanov joins the Lighter side!`
	`DCay joins the Lighter side!`
	`Side: Lighter, Members: 3`
	`! DCay`
	`! Ivan Ivanov`
	`! Royal`
		Although Ivan Ivanov doesn't have profile, we **register** him and add him to the Lighter side.
		We **remove DCay** from Darker side and add him to Lighter side.
		We print only Lighter side, because Darker side **has no members.**