01.Horse Racing

Now that your friend has become a sports journalist, he has to write down the actions that take place on the racetrack. Help him by writing a program that receives commands and prints template sentences.

Input

You will receive an **array** representing the current positions of the horses separated by the pipe symbol: "**|**". The order of the horses is **right to left** (the one on the far right is 1st and the one on the far left is last).

After that, you will be receiving **4 types of commands**. When the program receives "**Finish**", it should stop executing commands.

The commands can be:

- **Retake {overtaking-horse} {overtaken-horse}** – if the overtaking horse is to the left of the overtaken horse, **swap** the **position** of the two horses. Then, **print** the following on the console:
  - **"{overtaking-horse} retakes {overtaken-horse}."**
- **Trouble {horse-name}** – the given horse **drops by one position**, if it's **not** in the **last position already**. If the horse does drop, on the console should be **printed**:
  - **"Trouble for {horse-name} - drops one position."**
- **Rage {horse-name}** – the given horse **rages 2 positions** ahead. If the horse is in second position before the command is given, the horse just goes to the first position. If it's already in the first position, it stays in the first position. Then, on the console should be **printed**:
  - **"{horse-name} rages 2 positions ahead."**
- **Miracle** – the horse in the **last position** gets enormous power and **becomes the first**. Then, on the console should be **printed**:
  - **"What a miracle - {horse-name} becomes first."**

Constraints

- The **names** of the horses will **always** be **unique**.
- All given **commands** will be **valid**.

Output

Every command should **print its own template sentence**. After the program receives "**Finish**", it should print the **updated positions** of the horses, **separated by arrows** ("**->**"):

  - **"{horse3}->{horse2}->{horse1}"**

After the updated positions are printed, the **winner should be printed** as well:

  - **"The winner is: {horse1}"**

Examples

Input	Output
(['Bella|Alexia|Sugar', 'Retake Alexia Sugar', 'Rage Bella', 'Trouble Bella', 'Finish'])	Alexia retakes Sugar. Bella rages 2 positions ahead. Trouble for Bella - drops one position. Sugar->Bella->Alexia The winner is: Alexia
Input	**Output**
(['Onyx|Domino|Sugar|Fiona', 'Trouble Onyx', 'Retake Onyx Sugar', 'Rage Domino', 'Miracle', 'Finish'])	Onyx retakes Sugar. Domino rages 2 positions ahead. What a miracle - Sugar becomes first. Onyx->Fiona->Domino->Sugar The winner is: Sugar
Input	**Output**
(['Fancy|Lilly', 'Retake Lilly Fancy', 'Trouble Lilly', 'Trouble Lilly', 'Finish', 'Rage Lilly'])	Trouble for Lilly - drops one position. Lilly->Fancy The winner is: Fancy