Problem 2. Icarus

Icarus is the majestic phoenix who has been alive from the beginning of creation. Icarus travels through different planes. When Icarus travels through a plane, he damages Reality itself with his overwhelming, beyond godlike flames.

You will receive a **sequence** of **integers** – the **plane**. After that you will receive **1 integer** – an **index** in that **sequence**, which is Icarus's **starting position**. Icarus's **INITIAL DAMAGE** is **1**.

You will then begin **receiving commands** in the following format: "**`{direction} {steps}`**". The direction will be either "**`left`**" or "**`right`**", and the **steps** will be an **integer**. Depending on the direction, Icarus must **step** through the sequence of **integers to the left** or **right**. Each time he **steps** on a **NEW position**, he **damages** it. In other words, he **SUBTRACTS** his **current damage from** the **integer** at **that position**. Walking left and right has its conditions though:

- If Icarus **passes beyond** the **start** of the **sequence** (**`index: -1`**) while going **left**, he must go at the **end** of the **sequence** (**`index: length – 1`**).
- If Icarus **passes beyond** the **end** of the **sequence** (**`index: length - 1`**) while going **right**, he must go at the **start** of the **sequence** (**`index: 0`**).

If **1** of the **2 cases stated above** happens, Icarus **increments** his **damage** by **1**.

The input ends when you receive the command "**`Supernova`**". When that happens you must print what is **left** of the **sequence**.

Input

- On the **first input line** you will get the **sequence** of **integers**, **separated** by **spaces**.
- On the **second input line** you will get Icarus's **starting position**.
- On the **next several input lines** you will get the **commands**.

Output

- As output you must print a **single line** containing the **remaining elements** of the **sequence**, **separated** by **spaces**.

Constrains

- The **integers** in the **sequence** will be in **range [0, 1000]**.
- The **initial position** of Icarus will **always** be **valid** and **inside** the **sequence's indexes**.
- The **direction** will always be either "**`left`**" or "**`right`**".
- The **steps** will be in **range [0, 1000]**.
- There will be **NO invalid** input lines.
- Allowed working time / memory: **100ms / 16MB**.

Examples

Input	Output	Comments
50 50 25 50 50 3 left 2 right 2 left 2 right 2	50 48 21 48 50	Initial index: 3 Initial state: 50 50 25 50 50 Go left 2 steps: 50 50 24 50 50

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Supernova		50 49 24 50 50 Go right 2 steps: 50 49 23 50 50 50 49 23 49 50 Go left 2 steps: 50 49 22 49 50 50 48 22 49 50 Go right 2 steps: 50 48 21 49 50 50 48 21 48 50 Final state: 50 48 21 48 50
5 3 5 5 5 2 left 5 left 5 Supernova	2 0 0 0 0	Initial index: 2 Initial state: 5 3 5 5 5 Go left 5 steps: 5 2 5 5 5 4 2 5 5 5 4 2 5 5 3 4 2 5 3 3 4 2 3 3 3 Go left 5 steps: 4 0 3 3 3 2 0 3 3 3 2 0 3 3 0 2 0 3 0 0 2 0 0 0 0 Final state: 2 0 0 0 0

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