The Garden

Create a program that helps you **harvest** vegetables. There are **three** kinds of **vegetables** in your garden:

- **Lettuce** – **'L'**, **Potatoes** – **'P'**, **Carrots** – **'C'**

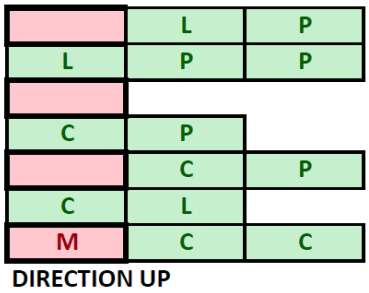
First, you will receive the **rows** of the garden. Then for **each** row, you will receive the **vegetables**, separated by space in the following format:

"{vegetable$_1$} {vegetable$_2$} {vegetable$_3$}… {vegetable$_n$}"

Then you will start receiving **commands**. Here are the possible ones you can receive:

- **"Harvest {row} {col}"** – you must go to the given place in the garden and harvest the vegetable, **if it exists**. When you harvest a vegetable, you leave an **empty space** in the cell – **' '.** Keep in mind, that you **can't harvest** a vegetable, which was already **harvested** or **harmed**.
- **"Mole {row} {col} {direction}"** – there is a mole in that cell and it goes in that direction, which means the mole, goes from **this cell** until the last cell in the given direction. It **harms** the **given cell**, **skips the next**, and **harms the next one**, an so on **until the last cell**. **Mark** the **harmed** cells with a **space** - **' '**. Keep in mind, that you **can't harm** a vegetable, that was **already harmed** or **harvested**. There are four possible directions:
  - **"Up", "Down", "Left", "Right"**
- **"End of Harvest"** – ends the input.

Here is an example of the **mole's harm radius**:



In the end, **print the resulting garden**. The cells must be **separated by a space**. Then **print** the **vegetbles** you have succesfully **harvested** and the **count** of **harmed vegetables** you have found in the following format:

"Carrots: {countOfCarrots}

Potatos: {countOfPotatos}

Lettuce: {countOfCucmbers}

Harmed vegetables: {count}"

Input / Constraints

- On the first line, you will receive the **count** of **rows**.
- On the next lines, for **each row**, you will receive the vegetables in the described format.
- Next, until you receive **"End of Harvest"**, you will be receiving commands in the described format.
- The input will always be **valid** and you don't need to check it explicitly.

Output

- Print the **resulting garden** – each cell separated by a single space.

- Print the **harvested** and **harmed vegatables** in the format described above.

Examples

Input	Output	Comment
4 L P C L L L L C P P P C C C C P C L P C L P C L Harvest 0 2 Harvest 3 0 Harvest 4 2 Mole 2 2 up Mole 1 1 right End of Harvest	L P L L L C P C C C C L P C L P C L Carrots: 1 Potatoes: 1 Lettuce: 0 Harmed vegetables: 4	When we receive the "**Harvest**" command, we go to the **given coordinates** and harvest the **'C'** and leave an empty space **' '**. After that, we go to the **'P'** on 3 0 and we take it. After that we receive **invalid coordinates**, so we don't do anything. Upon receiving the **mole** command, we **harm** the vegetable in **its cell** and every vegetable in the described way – harm the current cell, **skip** the **next** and this repeats **until the end of the row/coll.** We leave **empty spaces** in the cells. In the end, we have **4 harmed vegetables**, **one** harvested **carrot** and **one** harvested **potato**.
3 P L C C C C C C C L L P P P L L L Harvest 0 0 Harvest 1 3 Mole 2 0 up Harvest 2 5 Harvest 1 1 Harvest 0 2 Harvest 1 4 End of Harvest	L C C C L P P P L L Carrots: 4 Potatoes: 1 Lettuce: 1 Harmed vegetables: 1	