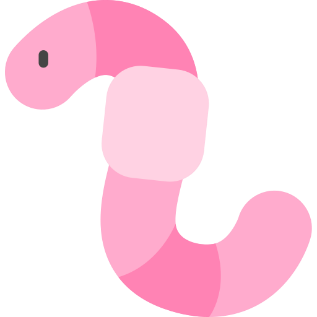
# Book Worm



You will be given a **string**. Then, you will be given an **integer** **N** for the **size** of the field with **square** shape. On the next **N** lines, you will receive the **rows** of the field. The player will be placed on a **random position**, marked with "**P**". On **random positions** there will be **letters**. **All of the empty positions** will be marked with "**-"**.

Each turn you will be given commands for the **player’s movement**. If he moves to a **letter**, he **consumes** it, **concatеnates** it to the **initial string** and the letter **disappears from the field**. If he tries to move **outside** of the field, he **is punished** -he **loses** the **last** letter **in the string**, **if there are any**, and the **player’s** **position** is **not changed**.

At the end **print all letters and the field**.

### Input

* On the **first line**, you are given the **initial string**
* On the **second line**, you are given the integer **N** - the size of the **square** matrix
* The **next N lines** holds the values for every **row**
* On the next line you receive a **number M**
* On the **next M lines** you will get a move **command**

### Output

* On the first line the **final** state of the **string**
* In the end print **the matrix**

### Constraints

* The size of the **square** matrix will be between **[2…10]**
* The **player position** will be **marked** with "**P**"
* The **letters** on the field will be **any letter except** for "**P**"
* Move commands will be: "**up**", "**down**", "**left**", "**right**"

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| Hello  4  P--- Mark -l-y --e- 4  down right right right | HelloMark ---- ---P -l-y --e- | The initial string we receive is "Hello". Then we receive 4x4 field and the player is on index [0;0].  Then, we start receiving commands. First the player moves to [1;0], where he consumes 'M', and then all letters on the right. Оur string is "HelloMark" and the player is on index [1;3]. |
| Initial  5  ----- t-r-- --Pa- --S-- z--t-  4 up left left left | Initialr ----- P---- ---a- --S-- z--t- | The initial string we receive is "Initial". Then we receive 5x5 field and the player is on index [2;2]. The player consumes 'r' and 't', but also tries to go out of the matrix once, so he loses the last character of his string – 't'. |