

Cooking journey



You successfully started your cooking journey, so now you need to sell the products from your basket in the pastry shop to collect your price.

You will be given an integer **n** for the **size** of the pastry shop with a **square** shape. On the next **n** lines, you will receive the **rows** of the pastry shop. You will be placed in a **random position**, marked with the letter '**S**'. On random positions, there will be clients, marked with a **single digit**. There **may** also be **pillars**. Their **count** will be either **0** or **2** and they are **marked** with the **letter** - '**P**'. **All of the empty positions** will be marked with '**-**'.

Each turn, you will be given **commands** for **your movement**. Move commands will be: "**up**", "**down**", "**left**", "**right**". If you **move** to a **client**, you **collect the price equal** to the **digit there** and the client **disappears**. If you move to a **pillar**, you move on to the **position** of the **other pillar** and then **both pillars disappear**. If you **go out** of the pastry shop, you **disappear** from the pastry shop and you are out of there. You need **at least 50 dollars** to rent your Pastry shop.

When **you are out of the pastry shop** or **you collect enough money**, the program **ends**.

Input

- On the first line, you are given the integer **n** – the size of the **square** matrix.
- The **next n lines** hold the values for every **row**.
- On each of the next lines, you will get a move command.

Output

- On the first line:
 - If the player goes to the void, print: "**Bad news! You are out of the pastry shop.**"
 - If the player collects enough star power, print: "**Good news! You succeeded in collecting enough money!**"
- On the second line print, all-star power collected: "**Money: {money}**"
- At the end print the matrix.

Constraints

- The size of the **square** matrix will be between **[2...10]**.
- There will **always** be **0** or **2** pillars, marked with the **letter** - '**P**'.
- Your position will be marked with '**S**'.
- You will **always** go out of the pastry shop or collect enough money.

Examples

Input	Output	Comments
5 SP--- ----- ----- ----- ----P right right	Bad news, you are out of the pastry shop. Money: 0 ----- ----- ----- ----- ----- -----	The first command is right. You move to one of the pillars and then appear on the other side of it (4,4). The pastry shop looks like this after the first command: ----- ----- ----- ----- -----S The second command is right. You go to the pastry shop.
6 S98--- 99---- 666666 ----- --77-- -6-6-6 right right down left left down right right	Good news! You succeeded in collecting enough money! Money: 53 ----- ----- --S666 ----- --77-- -6-6-6	Here we have no pillars and a pastry shop rich in clients. You manage to collect enough money without going out of the pastry shop. The clients you have sealed food to have disappeared and we can see where you were when you collected the last needed money (2,2).