Space Station Establishment

Stephen successfully started his journey in the galaxy and now he has to collect some star power in order to establish his very own Space Station.

You will be given an integer **n** for the **size** of the galaxy with **square** shape. On the next **n** lines, you will receive the **rows** of the galaxy. Stephen's spaceship will be placed on a **random position**, marked with the letter **`'S'`**. On random positions there will be stars, marked with a **single digit**. There **may** also be **black holes**. Their **count** will be either **0** or **2** and they are **marked** with the **letter** - **`'O'`**. **All of the empty positions** will be marked with **`'-'`**.

Each turn, you will be given **commands** for the **player's movement**. Move commands will be: **"up"**, "**down**", "**`left`**", "**`right`**". If he **moves** to a **star**, he **collects energy equal** to the **digit there** and the star **disappears**. If he moves to a **black hole**, he **appears** on the **position** of the **other black hole** and then **both** black holes **disappear**. If a player **goes out** of the galaxy, he goes into the void, **disappears** from the galaxy and is lost forever. He needs **at least 50 star power** to build the Space Station.

When **the player** is **lost** in the void **or collects enough star power,** the journey **ends**.

Input

- On the first line, you are given the integer **n** – the size of the **square** matrix.
- The **next n lines** holds 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, the spaceship went to the void."`**
  - If the player collects enough star power, print: **`"Good news! Stephen succeeded in collecting enough star power!"`**
- On the second line print all star power collected: **`"Star power collected: {starPower}"`**
- In the end print the matrix.

Constraints

- The size of the **square** matrix will be between **[2…10].**
- There will **always** be **0** or **2** black holes, marked with the **letter** - **`'O'`**.
- The player position will be marked with **`'S'`**.
- The player will **always** go to the void or collect enough star power.

Examples

Input	Output	Comments
5 SO--- ----- ----- ----- ----O right right	Bad news, the spaceship went to the void. Star power collected: 0 ----- ----- ----- ----- -----	The first command is right. The player moves to **one of the black holes** and then **appears** on the other side of it (4,4). The galaxy looks like this after the first command: ----- ----- ----- ----- ----S The second command is right. The player goes **out** of the galaxy and straight into the **void**.
6 S98--- 99---- 555555 ------ --77-- -6-6-6 right right down left left down right right	Good news! Stephen succeeded in collecting enough star power! Star power collected: 50 ------ ------ --S555 ------ --77-- -6-6-6	Here we have **no** black holes and a galaxy rich of stars. Our spaceship pilot manages to collect **enough** star power **without going out** of the galaxy and builds his Space Station! The stars he has collected disappeared and we can see where he was when he collected his last neeeded star power (2,2).