

02. Pacman

In this task, you are required to implement a simplified version of the classic Pacman game. The game is played on a square grid, and the goal is to guide Pacman to collect all the stars initially placed on the field while avoiding health loss caused by evil ghosts.

You will be given an integer **N** for the size of the **square game field** (grid). On the **next lines**, you will receive the **rows** of the **field**. The **Pacman** is marked with the **letter 'P'** and starts at a **random position** on the grid.

The **goal** is to guide **Pacman** in **collecting all the stars** while **avoiding health loss** caused by **ghosts**.

Star positions are marked with the symbol **'*'** while the **ghost positions** are marked with **'G'**.

Pacman **initially starts with 100 units of health**. When **Pacman** receives a **command**, it can move in **four directions** (**up, down, left, and right**) or **stop** and **finish the game** upon receiving a **command "end"**.

- When **Pacman** makes the **first move**, mark its **starting position** as **empty** with a **dash '-'**.
- If **Pacman reaches** an **empty position** ('-' **dash**), it waits for the next direction.
- Pacman **collects** a **star '*'** when moving onto a **star cell**. The **star** is **removed** from the grid, and the **total count of remaining stars is decreased** by **1**. The **cell must** be marked as **empty** with a **dash '-'**.

Hint: Consider determining the **total count of stars placed initially** on the **grid**.

- Moving onto a **ghost position** ('G') reduces Pacman's health by **50 units**. The **cell must** be marked as **empty** with a **dash '-'**.
 - If **Pacman hits two ghosts**, his **health reaches zero 0**, and the **game ends**.
- Moving onto a **freezer** 'F' **freezes** Pacman **temporarily** and **gives** him **immunity** against the **next encountered ghost** (Pacman will take no damage but just for once). The position **must** be marked with a **dash '-'**.
- A movement **outside** (leaving the grid's boundaries) **positions** Pacman to the **opposite side**.

Example: Moving out of the **top** boundary **repositions** Pacman at the **bottom** of the same column.

The **program ends instantly** in one of the **following cases**:

- Pacman **collects all the stars** placed initially on the field.

- Pacman's **health** reaches **zero 0**.
- Pacman receives the **command "end"** which **forces** it to **stop moving** and **quits** the **game**.

Input

- An integer **N** representing the **square grid (field) size**.
- The **next N lines** hold the values for **every row**.
- Following are **direction commands** or **command "end"**, each on a new line.

Output

- If Pacman's **health reaches zero 0**, print:

"Game over! Pacman last coordinates [{row},{col}]"

- If Pacman manages to **collect all the stars**, print:

"Pacman wins! All the stars are collected."

- If Pacman's **health is more than zero 0** but it did **not collect all the stars** due to receiving a **command "end"**, print:

"Pacman failed to collect all the stars."

- Following print:

- In all cases:

"Health: {remaining_health}"

- If there are still stars to collect, print (otherwise skip it):

"Uncollected stars: {uncollected_stars_count}"

- Finally print the **final state** of the **grid (field)** with the **last known position** of **Pacman**, **marked** with '**P**' on it.

Constraints

- The **square grid (field) size** will be between **[3...8]** inclusive.
- **Commands** will always be **valid** (up, down, left, right, end).
- **Pacman** will always have a **valid starting position 'P'**.
- **Stars** marked by '*' will always be **present** on the **field**.
- **Ghosts 'G'** will always be **at least two**.
- **Freezers 'F'** can be **zero or one**.
- Empty cells marked with a **dash '-'**.

Examples

Input	Output
3 P-- *** G-G down down right right right end	Game over! Pacman last coordinates [2,2] Health: 0 Uncollected stars: 2 --- -** --P
4 P--- ---- **** G-GF right right right up left left left up right right right end	Pacman wins! All the stars are collected. Health: 50 ---- ---- ---P
5 P---- --G*- -*--F -*G*- ----- up right	Pacman failed to collect all the stars. Health: 100 Uncollected stars: 4 ----- -*--F -*G*- -----

right

down

down

left

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end

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