Python Advanced: Exam Preparation

1. Christmas Elves

Link to Judge: https://judge.softuni.org/Contests/Practice/Index/3306#0

Everything in the Satna Claus' workshop was going well until, on one freezing Sunday, a dangerous storm destroyed almost all toys. Now Santa's elves fear they won't be able to meet their December deadline. It could be a disaster, and some children around the world may not get their Christmas toys. Luckily, you've come up with an idea, and you just need to write a program that manages your plan.

The Christmas elves have special toy-making skills - each elf can make a toy from a given number of materials.

First, you will receive a sequence of **integers** representing each **elf's energy**. On the following line, you will be given another sequence of **integers,** each representing a **number of materials in a box**.

Your task is to calculate **the total elves' energy used** for making toys and **the total number of successfully made toys**.

You are very clever and have immediately recognized the **pros and cons of the work process** - the **first elf** takes **the last box of materials** and tries to create the toy:

- Usually, the elf **needs energy equal to the number of materials**. If he **has enough** energy, he **makes the toy**. His energy **decreases** by the used energy, and the **toy goes straight to Santa's bag**. Then, the elf **eats** a cookie reward which **increases his energy by 1**, and **goes to the end of the line**, preparing for the upcoming boxes.
- Every **third time** one of the elves **takes a box**, he tries his best to be creative, and **he will need twice as much energy as usual**. If **he has enough**, he manages to create **2 toys**. Then, his **energy decreases;** he eats a **cookie reward** and **goes to the end of the line,** similar to the first bullet.
- Every **fifth time** one of the elves **takes a box**, he is a little clumsy and somehow manages to **break the toy when he just made it (if he made it)**. The **toy is thrown away,** and the **elf doesn't get a cookie reward**. However, his **energy is already spent,** and it needs to be **added** to the total elves' energy.
    - **If an elf creates 2 toys, but he is clumsy, he breaks them.**
- If an elf does **not** have enough energy, he **leaves the box of materials to the next elf**. Instead of making the toy, the elf drinks a hot chocolate which **doubles his energy**, and **goes to the end of the line**, preparing for the upcoming boxes.

Note: North Pole's social policy is very tolerant of the elves. If the **current elf's energy** is **less than 5 units**, he **does NOT TAKE a box**, but he takes a day off. **Remove the elf** from the collection.

Stop crafting toys when you are out of materials or elves.

1. Input

- The **first** line of input will represent each elf's energy - **integers**, separated by a **single space**
- On the **second** line, you will be given the **number of materials in each box** - **integers**, separated by a **single space**

2. Output

- On the **first line**, print **the number of created toys**: **`"Toys: {total_number_of_toys}"`**
- On the **second line**, print **the total used energy**: **`"Energy: {total_used_energy}"`**

- On the **next two lines** print the **elves** and **boxes** that are **left**, **if there are any**, **otherwise skip the line:**
  - `"Elves left: {elf1}, {elf2}, … {elfN}"`
  - `"Boxes left: {box1}, {box2}, … {boxN}"`

3. Constraints

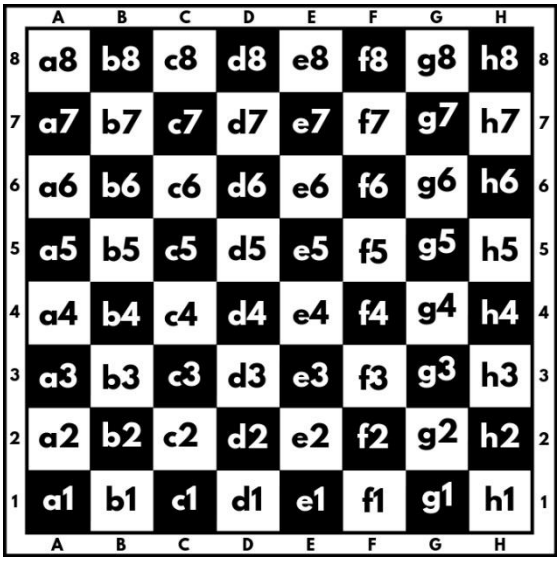
- All the elves' values will be **integers** in the range **[1, 100]**
- All the boxes' values will be **integers** in the range **[1, 100]**

4. Examples

Input	Output	Comment
10 16 13 25 12 11 8	Toys: 3 Energy: 31 Elves left: 3, 6, 26, 14	1) The elf with energy **10** takes the box with **8** materials. He creates **1 gift** and uses **8 units of energy**. He eats a cookie and goes to the end of the line, which now looks like this: **16 13 25 3**. 2) The elf with energy **16** takes the box with 11 materials. He creates **1 gift** and uses **11 units of energy**. Then, he eats a cookie and goes to the end of the line, which now looks like this: **13 25 3 6**. 3) The elf with energy **13** takes the box with **12 materials**. It is the **third** time an elf takes a box. The elf does not have the needed energy: **12 * 2**, so he drinks a hot chocolate and goes to the end of the line: **25 3 6 26**. 4) The elf with energy **25 takes the box** with 12 materials. It is the **fourth** time an elf takes a box. He creates **1 gift** and uses **12 units of energy**. He eats a cookie and goes to the end of the line, which now looks like this: **3 6 26 14**. No boxes are left, so the program ends. Print the desired text.
10 14 22 4 5 11 16 17 11 1 8	Toys: 7 Energy: 75 Elves left: 10, 14	
5 6 7 2 1 5 7 5 3	Toys: 3 Energy: 20 Boxes left: 2, 1	

2. Pawn Wars

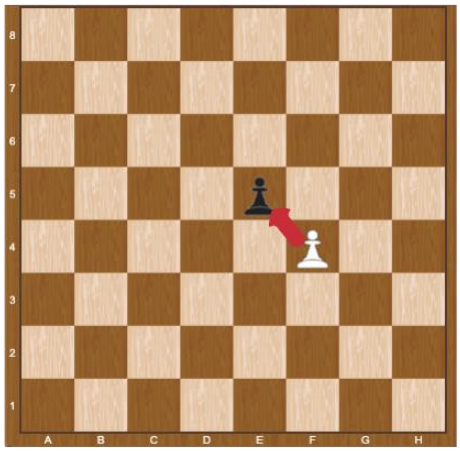
Link to Judge: https://judge.softuni.org/Contests/Practice/Index/3374#1



A chessboard has 8 rows and 8 columns. Rows, also called ranks, are marked from number 1 to 8, and columns are marked from A to H. We have a total of 64 squares. Each square is represented by a combination of letters and a number (a1, b1, c1, etc.). In this problem colors of the board will be ignored.

We will play the game with two pawns, **white (w)** and **black (b)**, where they can:

- **Only** move **forward** in a **straight line**:
  - White (**w**) moves from the 1st rank to the 8th rank direction.
  - Black (**b**) moves from 8th rank to the 1st rank direction.
- Can move only 1 square at a time.
- Can **capture** another pawn **in from of them only diagonally**:



When a pawn reaches the **last rank** (for the **white one - this is the 8th** rank, and **for the black one - this is the 1st** rank), can be **promoted** to a **queen**.

Two pawns (**w** and **b**) will be placed on two random squares of the bord. The **first move is always made by the white pawn** (**w**), then black moves (b), then white (w) again, and so on.

Some rules apply when moving paws:

- If the **two pawns interact diagonally**, the player, in turn, **must capture** the opponent's pawn. When a pawn **captures another pawn**, the **game is over**.
- If no capture is possible, the pawns **keep on moving** until **one** of them **reaches the last rank**.

Input

- On 8 **lines**, you will receive **each row with its 8 columns, each element separated by a single space:**
  - **Empty positions** are marked with **"-"**.
  - **White** pawn is marked with **"w"**
  - **Black** pawn is marked with **"b"**

Output

Print either one of the following:

- **If a pawn captures the other**, print:
  - **"Game over! {White/Black} win, capture on {square}."**
- **If a pawn reaches the last rank**, print:
  - **"Game over! {White/Black} pawn is promoted to a queen at {square}."**

Constraints

- The input will always be valid.
- The matrix will always be 8x8.
- There will be no case where two pawns are placed on the same square.
- There will be no case where two pawns are placed on the same column.
- There will be no case where black/white will be placed on the last rank.

Examples

Input	Output	Comments
- - - - - - b - w -	Game over! White pawn is promoted to a queen at b8.	We start by pushing the white pawn to **b4**, next, we push the black pawn to **g7**: - - - - - - - - - - - - - - b - - - - - - - - - - - - - - - - - - w - Then white play **b5**, black play **g6**: - b - - w - ... Capturing is not possible here, so after a few more moves, the white pawn is promoted to a queen on **b8**.

- b - - - - - - - - w - - - - - - - - - - - - - -	Game over! White win, capture on a3.	A white pawn always start first, so it must capture the black one on **a3** in the first move: - w -

3. Words Sorting

Link to Judge: https://judge.softuni.org/Contests/Practice/Index/3430#2

Write a function **`words_sorting`** which receives a different number of words.

Create a dictionary, which will have as keys the words that the function received. For each key, create a value that is the sum of all ASCII values of that key.

Then, **sort the dictionary**:

- **By values** in **descending** order, if the **sum of all values** of the dictionary is **odd**
- **By keys** in **ascending** order, if the **sum of all values** of the dictionary is **even**

Note: Submit only the function in the judge system

Input

- There will be **no input**, just any number of words passed to your function

Output

- The function should **return a string** in the format **`"{key} - {value}"`** for each key and value on a **separate lines**

Constraints:

- There will be **no case** with **capital** letters.
- There will be **no case** with a string consisting of **other than letters**.

Examples

Test Code	Output	Comment

`print(`
`  words_sorting(`
`  'escape',`
`  'charm',`
`  'mythology'`
`))`
	`charm - 523`
	`escape - 625`
	`mythology - 1004`
		All of the ascii values of the 'escape' word are:
		e = 101, s = 115, c = 99, a = 97, p = 112, e = 101
		Their sum is 625.
		We add it in the dictionary {'escape': 625}.
		The ascii values of the 'charm' are:
		c = 99, h = 104, a = 97, r = 117, m = 109
		Their sum is 523.
		We add it in the dictionary {'escape': 625, 'charm': 625}

		The ascii values of the 'mythology' word are: m = 109, y = 121, t = 116, h = 104, o = 111, l = 108, o = 111, g = 103, y = 121. Their sum is 1004. We add it in the dictionary {'escape': 625, 'charm': 523, 'mythology': 1004} When we sum 625 + 523 + 1004 = 2152. The result is even, and we sort the dictionary by keys in ascending order.

`print(`
`  words_sorting(`
`  'escape',`
`  'charm',`
`  'eye'`
`  ))`
	`escape - 625`
	`charm - 523`
	`eye - 323`	

`print(`
`  words_sorting(`
`  'cacophony',`
`  'accolade'`
`  ))`
	`accolade - 812`
	`cacophony - 964`	