Exercises: Arrays Advanced

Problems for exercise and homework for the "JS Fundamentals" Course @ SoftUni.
Submit your solutions in the SoftUni judge system at: https://judge.softuni.bg/Contests/1299

1. Train

You will be given an **array of strings**.

The **first** element will be **a string containing wagons** (numbers). Each number inside the string represents **the number of passengers that are currently in a wagon**.

The **second** element in the array will be **the max capacity of each wagon** (single number).

The **rest** of the elements will be **commands** in the following format:

- **Add** `{passengers}` – add a wagon to the end with the given number of passengers.
- `{passengers}` - find an existing wagon to **fit all the passengers** (**starting from the first wagon**)

At the end **print the final state** of the train (all the wagons **separated** by a space)

Example

Input	Output
['32 54 21 12 4 0 23', '75', 'Add 10', 'Add 0', '30', '10', '75']	72 54 21 12 4 75 23 10 0
['0 0 0 10 2 4', '10', 'Add 10', '10', '10', '10', '8', '6']	10 10 10 10 10 10 10

2. Distinct Array

You will be given an **array of integer numbers** on the first line of the input (**space-separated**).

Remove all **repeating elements** from the array.

Print the result elements **separated** by single space.

Examples

Input	Output	Comments

`[1, 2, 3, 4]`	`1 2 3 4`	No repeating elements
`[7, 8, 9, 7, 2, 3, 4, 1, 2]`	`7 8 9 2 3 4 1`	7 and 2 are already present in the array ➔remove them
`[20, 8, 12, 13, 4, 4, 8, 5]`	`20 8 12 13 4 5`	4 and 8 are already present in the array ➔remove them

3. House Party

Write a function that keeps track of **guests** that are going to a house party.

You will be given an **array of strings**. Each string will be one of the following:

- **`"{name} is going!"`**
- **`"{name} is not going!"`**

If you receive the **first type of input**, you have to **add** the person if he/she **is not** in the list (If he/she is in the list print: **`"{name} is already in the list!"`**).

If you receive the **second type of input**, you have to **remove** the person if he/she **is** in the list (if not print: **`"{name} is not in the list!"`**).

At the end print all the guests each on a **separate line**.

Examples

Input	Output

`['Allie is going!',`
`'George is going!',`
`'John is not going!',`
`'George is not going!']`
	`John is not in the list!`
	`Allie`

`['Tom is going!',`
`'Annie is going!',`
`'Tom is going!',`
`'Garry is going!',`
`'Jerry is going!']`
	`Tom is already in the list!`
	`Tom`
	`Annie`
	`Garry`
	`Jerry`

4. Sorting

Write a function that sorts an **array of numbers** so that the first element is the **biggest** one, the second is the **smallest** one, the third is the **second biggest** one, the fourth is the **second smallest** one and so on.

Print the elements on one row, **separated** by single space.

Examples

Input	Output

[1, 21, 3, 52, 69, 63, 31, 2, 18, 94]	94 1 69 2 63 3 52 18 31 21

5. Sort an Array by 2 Criteria

Write a function that orders an **array of strings**, by their **length** in **ascending order** as **primary criteria**, and by **alphabetical value** in **ascending order** as **second criteria**. The comparison should be **case-insensitive**.

The **input** comes as **array of strings**.

The **output** is the **ordered** array of strings.

Examples

Input	Output
["alpha", "beta", "gamma"]	beta alpha gamma

Input	Output
["Isacc", "Theodor", "Jack", "Harrison", "George"]	Jack Isacc George Theodor Harrison

Hints

- An array can be **sorted** by passing a comparing function to the **`Array.sort()`** function
- Creating a comparing function by 2 criteria can be achieved by first comparing by the **main criteria**, if the 2 items are different (the result of the compare is not 0) - return the result as the result of the comparing function. If the two items are the same by the **main criteria** (the result of the compare is 0), we need to compare by the **second criteria** and the result of that comparison is the result of the comparing function

6. Bomb Numbers

Write a function that receives two parameters: **sequence of numbers** and **special bomb number** with a certain **power**.

Your task is to **detonate every occurrence** of the **special bomb number** and according to its power **his neighbors from left and right**. Detonations are performed from **left to right** and all detonated numbers **disappear**.

The input contains two **arrays of numbers**. The first contains the **initial sequence** and the second contains the **special bomb number** and **it's power**.

The output is the **sum of the remaining elements** in the sequence.

Examples

Input	Output	Comments
[1, 2, 2, 4, 2, 2, 2, 9], [4, 2]	12	Special number is **4** with power **2**. After detontaion we are left with the sequence [1, 2, 9] with sum 12.

[1, 4, 4, 2, 8, 9, 1], [9, 3]	5	Special number is **9** with power **3**. After detontaion we are left with the sequence [1, 4] with sum 5. Since the 9 has only 1 neighbour to the right we **remove just it** (one number instead of 3).
[1, 7, 7, 1, 2, 3], [7, 1]	6	Detonations are performed from **left to right**. We could not detonate the second occurance of 7 because its **already destroyed** by the first occurance. The numbers [1, 2, 3] survive. Their sum is 6.
[1, 1, 2, 1, 1, 1, 2, 1, 1, 1], [2, 1]	4	The red and yellow numbers disappear in two sequential detonations. The result is the sequence [1, 1, 1, 1]. Sum = 4.

7.Search for a Number

You will receive two **arrays** of **integers**. The second **array is** contains exactly **three numbers**.

First number represents the **number** of **elements** you have to **take** from the first **array** (**starting** from the **first one**).

Second number represents the **number** of **elements** you have to **delete** from the numbers you took (**starting** from the **first one**).

Third number is the **number** we **search** in our collection after the manipulations.

As output print how many times that **number** occurs in our array in the following format:

`"Number {number} occurs {count} times."`

Examples

Input	Output	Comments
[5, 2, 3, 4, 1, 6], [5, 2, 3]	Number 3 occurs 1 times.	First we take **5 elements** from the array. Delete the first **2 elements**. Then we search for the **number 3**.

8 . *Array Manipulator

Write a function that **receives an array of integers** and **array of string commands** and **executes them over the array**. The commands are as follows:

- **`add <index> <element>`** – adds element at the specified index (elements right from this position inclusively are shifted to the right).
- **`addMany <index><element 1> <element 2> … <element n>`** – adds a set of elements at the specified index.
- **`contains <element>`** – prints the index of the first occurrence of the specified element (if exists) in the array or **-1** if the element is not found.
- **`remove <index>`** – removes the element at the specified index.
- **`shift <positions>`** – **shifts every element** of the array the number of positions **to the left** (with rotation).

- For example, [1, 2, 3, 4, 5] -> shift 2 -> [3, 4, 5, 1, 2]
- **`sumPairs`** – sums the elements in the array by pairs (first + second, third + fourth, …).
  - For example, [1, 2, 4, 5, 6, 7, 8] -> [3, 9, 13, 8].
- **`print`** – stop receiving more commands and print the last state of the array.

Examples

Input	Output

`[1, 2, 4, 5, 6, 7],`
`['add 1 8', 'contains 1', 'contains 3', 'print']`
	`0`
	`-1`
	`[ 1, 8, 2, 4, 5, 6, 7 ]`

`[1, 2, 3, 4, 5],` `['addMany 5 9 8 7 6 5', 'contains 15', 'remove 3', 'shift 1', 'print']`	`-1` `[ 2, 3, 5, 9, 8, 7, 6, 5, 1 ]`

9. *Gladiator Inventory

As a gladiator, Peter has cool Inventory. He loves to buy new equipment. You are given Peter's inventory with all of his equipment -> strings, separated by whitespace.

You may receive the following commands:

- **`Buy {equipment}`**
- **`Trash {equipment}`**
- **`Repair {equipment}`**
- **`Upgrade {equipment}-{upgrade}`**

If you receive **Buy command**, you should **add** the equipment at last position in the inventory, but only if it isn't bought already.

If you receive **`Trash` command**, **delete** the equipment if it exists.

If you receive **`Repair` command**, you should **repair** the equipment if it exists and place it on **last position**.

If you receive **`Upgrade` command**, you should check if the equipment exists and **insert** after it the upgrade in the following format: **`"{equipment}:{upgrade}";`**

Input / Consrtaints

You will receive an **`array` of strings**. Each element of the array is a command.

- In the **first input element,** you will receive Peter's **inventory** – sequence of equipment names, separated by space.

Output

As output you must print Peter's **inventory**.

Constraints

- The **command will always be valid.**
- The **equipment** and **Upgrade** will be strings and will contain any character, except **'-'**.
- Allowed working **time** / **memory**: **100ms** / **16MB**.

Scroll down to see examples.

Examples

Input	Output	Comment
['SWORD Shield Spear', 'Buy Bag', 'Trash Shield', 'Repair Spear', 'Upgrade SWORD-Steel']	SWORD SWORD:Steel Bag Spear	We receive the inventory => SWORD, Shield, Spear We Buy Bag => SWORD, Shield, Spear, Bag Trash Shield => SWORD, Spear, Bag Repair Spear => SWORD, Bag, Spear We add Upgrade => SWORD, SWORD:Steel, Bag,Spear We print the inventory.
['SWORD Shield Spear', 'Trash Bow', 'Repair Shield', 'Upgrade Helmet-V']	SWORD Spear Shield	

10. *Build a Wall

Write a program that keeps track of the construction of a **30-foot** wall. You will be given an **array of strings** that must be **parsed** as **numbers**, representing the initial height of mile-long sections of the wall, in feet. Each section has its own construction crew that can **add 1** foot of height per day by using 195 cubic yards of concrete. All crews work simultaneously (see examples), meaning all sections that aren't completed (are less than 30 feet high) **grow** by 1 foot every day. When a section of the wall is complete, its crew is relieved.

Your program needs to keep track of how much concrete is used **daily** until the completion of the entire wall. At the end, print on a single line, separated by comma and space, the amount of **concrete** used each **day**, and on a second line, the **final cost** of the wall. One cubic yard of concrete costs **1900** pesos.

Input

Your program will receive an **array of strings** representing **numbers as a parameter**.

Output

Print on the console on **one line** the **amount of concrete used each day separated by comma and space**, and on a **second line**, the **final cost** of the wall.

Constraints

- The wall may contain up to 2000 sections (2000 elements in the initial array)
- Starting height for each section is within range [0…30]

Examples

Input	Output
`[21, 25, 28]`	`585, 585, 390, 390, 390, 195, 195, 195, 195` `5928000 pesos`

Explanation

On the first day, all **three** crews work, each adding 1 **foot** to their section, 585 cubic yards total (3 x 195). On the second day, it's the same with the last section reaching 30 feet and its crew being **relieved** (marked in red while they don't work). On the third day, only **two** crews work, using up 390 cubic yards total. This continues for 2 more days, with the second section reaching 30 feet. In the remaining 4 days, only 1 crew works, using 195 cubic yards every day. Over the entire period, 3120 cubic yards of concrete were used, costing 5'928'000 pesos. And that was for just 3 miles, imagine 2000!

Starting	**[21, 25, 28]**
Day 1	**[22, 26, 29]**
Day 2	**[23, 27, 30]**
Day 3	**[24, 28, 30]**
Day 4	**[25, 25, 30]**
Day 5	**[26, 30, 30]**
Day 6	**[27, 30, 30]**
Day 7	**[28, 30, 30]**
Day 8	**[29, 30, 30]**
Day 9	**[30, 30, 30]**

Input	Output
`[17]`	`195, 195, 195, 195, 195, 195, 195, 195, 195, 195, 195, 195, 195` `4816500 pesos`

Input	Output
`[17, 22, 17, 19, 17]`	`975, 975, 975, 975, 975, 975, 975, 975, 780, 780, 780, 585, 585`

	21489000 pesos