Exercises: Arrays

Please submit your solutions (source code) of all below-described problems in Judge

1. Zig-Zag Arrays

Write a program that creates two arrays:

- Read an integer number **N (N < 100) from the first line of the console**, which represents **size of the arrays**
- On the next **N** lines, read **two integer numbers**
- **Form two arrays** as shown below
- Print two arrays, **each on the separate line**
- Elements in the arrays have to be printed, **separated by single space**

Examples

Input	Output
4 1 5 9 10 31 81 41 20	1 10 31 20 5 9 81 41
2 80 23 31 19	80 19 23 31

2. Longest Sequence

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- Finds the **longest sequence of equal elements** in the given integer array
- Prints that **sequence** on the console (integer numbers are separated by single space on a single line)

Note: If there is more than one such sequence, print the last one.

Examples

Input	Output
7 13 10 10 1 4 2 10	10 10
5 13 42 19 21 103	103

3. Above Average

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- Find all numbers which are **larger than or equal to the mathematical average (rounded to the smallest integer number)** of the numbers in the array
- The numbers should be printed on a single line, separating the output number by spaces.

Note: The output numbers should be in the same order as they were in the input.

Examples

Input	Output
5 1 2 3 4 5	3 4 5
6 5 4 3 8 9 0	5 4 8 9

4. Most Frequent Number

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- **Integer numbers in the array will be in the range [0, 9]**
- Find the **most frequent number** in the given integer array
- Print the **most frequent number**

Note: In case of multiple numbers with the same maximal frequent, print all of them, ordered from smallest to largest, separated by space.

Examples

Input	Output	Comments
13 4 1 1 4 2 3 4 4 1 2 4 9 3	4	The number 4 is the most frequent
8 2 2 2 2 1 2 2 2	2	The number 2 is the most frequent

5. Cartesian Product

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- Find and print the **product of each of its elements with all elements**

Example:

For the array {1, 7, 3} the result would be: **{1*1, 1*7, 1*3, 7*1, 7*7, 7*3, 3*1, 3*7, 3*3},** which gives us the array **{1, 7, 3, 7, 49, 21, 3, 21, 9},** so for the input **1 7 3,** the program should print **1 7 3 7 49 21 3 21 9.**

Examples

Input	Output

3 1 7 3	1 7 3 7 49 21 3 21 9
2 -1 4	1 -4 -4 16

6. Closest Numbers

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- Finds the **two closest (by value) integer numbers** in the array
- Prints the **absolute difference** between them

Examples

Input	Output	Comments
5 1 105 10 100 3	2	The closest numbers are 1 and 3 abs(1 - 3) = abs (-2) = 2
9 1 2 3 4 5 6 7 8 9	1	All numbers are exactly 1 unit apart

7. Array Rotation

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- Read an **integer number from the third line of the console**, which represents **count rotations you have to perform**
- **One rotation is when the first element goes at the end (first element becomes last element)**
- Print the **resulting array elements**, separated by single space

Examples

Input	Output
5 51 47 32 61 21 2	32 61 21 51 47
4 32 21 61 1 4	32 21 61 1
4 2 4 15 31 5	4 15 31 2

8. Top Integers

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console

- Find all the top integers in an array
- **Top integer is an integer that is bigger than all the elements to its right**
- Print **all top integers**, separated by single space

Examples

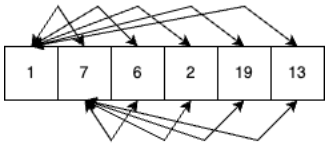
Input	Output
4 1 4 3 2	4 3 2
6 14 24 3 19 15 17	24 19 17
7 27 9 42 2 13 45 48	48

9. Magic Sum

Write a program that:

- Read an **integer number N (N < 100) from the first line of the console**, which represents **size of the array**
- Read an **integer array with the given size** from the second line of the console
- Read an **integer number from the third line of the console**, which represents **magic sum**
- Print all unique pairs in an array of integers whose sum is equal to the given **magic sum**

Note: Here's how to generate all pairs for the first two numbers of an array. Use the same logic for the whole array:



Examples

Input	Output
6 1 7 6 2 19 23 8	1 7 6 2
7 14 20 60 13 7 19 8 27	14 13 20 7 19 8