# Lab: Arrays, Matrices, Multi-Dimensional Arrays

Problems for in-class lab for the [“JavaScript Fundamentals” course @ SoftUni](https://softuni.bg/courses/javascript-fundamentals). Submit your solutions in the SoftUni judge system at <https://judge.softuni.bg/Contests/311>.

## Sum First Last

Write a JS function that calculates and prints the sum of the first and the last elements in an array.

The **input** comes as array of string elements holding numbers.

The **output** is the return value of your function.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['20', '30', '40'] | 60 | ['5', '10'] | 15 |

## Even Position Element

Write a JS function that finds the elements at even positions in an array.

The **input** comes as array of string elements holding numbers.

The **output** is the return value of your function. Collect all elements in a string, separated by space.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['20', '30', '40'] | 20 40 | ['5', '10'] | 5 |

## Negative / Positive Numbers

Write a JS function that processes the elements in an array one by one and produces a new array. Prepend each negative element at the front of the result and append each positive (or 0) element at the end of the result.

The **input** comes as array of string elements holding numbers.

The **output** is printed on the console, each element on a new line.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['7', '-2', '8', '9'] | -2  7  8  9 | ['3', '-2', '0', '-1'] | -1  -2  3  0 |

## First and Last K Numbers

Write a JS function that prints the first **k** and the last **k** elements from an array of numbers.

The **input** comes as array of string elements holding numbers. The first element represents the number **k**, all other elements are from the array that needs to be processed.

The **output** is printed on the console on two lines. On the first line print the **first** **k** elements, separated by space. On the second line print the **last** **k** elements, separated by space.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['2',  '7', '8', '9'] | 7 8  8 9 | ['3',  '6', '7', '8', '9'] | 6 7 8  7 8 9 |

## Last K Numbers Sequence

You are given two integers **n** and **k**. Write a JS function that generates and prints the following sequence:

* The first element is 1
* Every following element equals the sum of the previous **k** elements
* The length of the sequence is **n** elements

The **input** comes as array of two string elements holding numbers. The first element represents the number **n**, and the second – the number **k**.

The **output** is printed on the console on a single line, separated by space.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['6', '3'] | 1 1 2 4 7 13 | ['8', '2'] | 1 1 2 3 5 8 13 21 |

#### Explanation

The 2nd element (1) is the sum of the 3 elements before it, but there is only 1, so we take that. The third element, is the sum of the first 2 (1 and 1) and the 4th – the sum of 1, 1 and 2. The 5th element is the sum of the 2nd, 3rd and 4th (1, 2 and 4) and so on.

## Process Odd Numbers

You are given an array of numbers. Write a JS function that prints the elements at odd positions from the array, doubled and in reverse order.

The **input** comes as array of string elements holding numbers.

The **output** is printed on the console on a single line, separated by space.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['10', '15', '20', '25'] | 50 30 | ['3', '0', '10', '4', '7', '3'] | 6 8 0 |

## Smallest Two Numbers

Write a JS function that prints the two smallest elements from an array of numbers.

The **input** comes as array of string elements holding numbers.

The **output** is printed on the console on a single line, separated by space.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['30', '15', '50', '5'] | 5 15 | ['3', '0', '10', '4', '7', '3'] | 0 3 |
|  |  |  |  |  |

## Biggest Element

Write a JS function that finds the biggest element inside a matrix.

The **input** comes as array of string elements. Each element contains the elements from one row of a matrix, separated by space.

The **output** is the return value of your function. Find the biggest element and return it.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['20 50 10',  '8 33 145'] | 145 | ['3 5 7 12',  '-1 4 33 2',  '8 3 0 4'] | 33 |

## Diagonal Sums

A square matrix of numbers comes as an array of strings, each string holding numbers (space separated). Write a JS function that finds the sum at the main and at the secondary diagonals.

The **input** comes as array of string elements. Each element contains the elements from one row of a matrix, separated by space.

The **output** is printed on the console, on a single line separated by space. First print the sum at the main diagonal, then the sum at the secondary diagonal.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['20 40',  '10 60'] | 80 50 | ['3 5 17',  '-1 7 14',  '1 -8 89'] | 99 25 |

## Equal Neighbors

Write a JS function that finds the number of equal neighbor pairs inside a matrix of variable size and type (numbers or strings).

The **input** comes as array of string elements. Each element contains the elements from one row of a matrix, separated by space.

The **output** is return value of you function. Save the number of equal pairs you find and return it.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| ['2 3 4 7 0',  '4 0 5 3 4',  '2 3 5 4 2',  '9 8 7 5 4'] | 1 | ['test yes yo ho',  'well done yo 6',  'not done yet 5'] | 2 |