**Lab: Arrays Advanced**

Problems for in-class lab for the [“Technology Fundamentals” course @ SoftUni](https://softuni.bg/trainings/2056/technology-fundamental-september-2018#lesson-9616).

Submit your solutions in the SoftUni judge system at: [Arrays-Advanced-Lab](https://judge.softuni.bg/Contests/1254/Arrays-Advanced-Lab)

## 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 |

1. **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 number elements.

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 |

**Hints**

* Find a method that can add elements at the first position.
* Find a method that can add elements at the last position.

1. **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 number elements. 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 |

### Hints

* For example- we receive on the first line-2, and on the second -7,8,9
* We need to print the first 2 and the last 2 elements (7,8 and 8,9)

1. **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 two number arguments. 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.

1. **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 number elements.

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 |

### Hints

* Counting in arrays starts from 0
* For example –we receive 10,15,20,25
* The elements at odd positions are 15 ( index 1) and 25 (index 3)
* We need to take this two elements and multiply them \* 2
* Finally we print them on the console in reversed order

1. **Smallest Two Numbers**

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

The **input** comes as array of number elements.

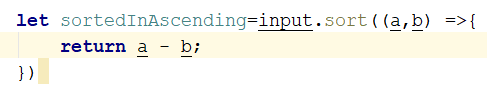
The **output** is printed on the console on a single line, separated by space.

**Examples**

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

### Hints

* You can use the following function to sort the numbers in the array:



* After we use this function, at the first two indexes we will have the smallest numbers
* You can use slice() function to take the first two numbers

1. **List of products**

You will receive an **array of products**. Print a **numbered array** of all the products **ordered by name**.

**Example**

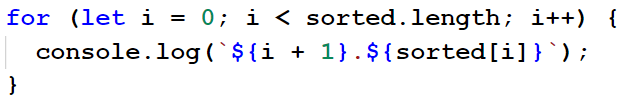
|  |  |
| --- | --- |
| **Input** | **Output** |
| ["Potatoes", "Tomatoes", "Onions", "Apples"] | 1.Apples  2.Onions  3.Potatoes  4.Tomatoes |

**Hints**

The **sort function** sorts the array in ascending order.



Finally, we have to **print our sorted** array. To do that we **loop through the array**.



We use **i + 1**, because we want to **start counting from 1**.

1. **Array Manipulations**

Write a JS function that manipulates an **array of numbers**.

**Add {number}:** add a number to the end of the array

**Remove {number}:** remove number from the array

**RemoveAt {index}:** removes number at a given index

**Insert {number} {index}:** inserts a number at a given index

**Note: All the indices will be valid!**

Print the **final state** of the array (**separated by spaces**)

The **input** comes as **array of strings**. First input will be a string containing the **array to manipulate**. Every other **command** you receive will be a string.

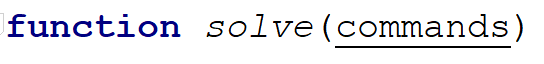
The **output** is the manipulated array printed on the console on a single line, **separated by space**.

**Example**

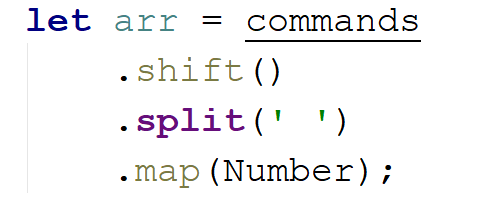
|  |  |
| --- | --- |
| **Input** | **Output** |
| ["4 19 2 53 6 43",  "Add 3",  "Remove 2",  "RemoveAt 1",  "Insert 8 3"] | 4 53 6 8 43 3 |

**Hints**

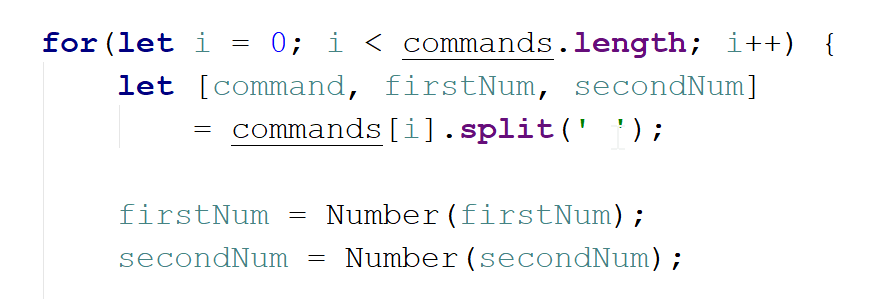
First we receive the whole input:



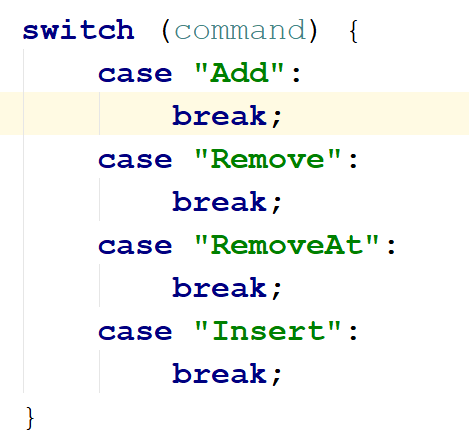
After that we take the **first** element from the commands and **convert** it to an **array of numbers**:



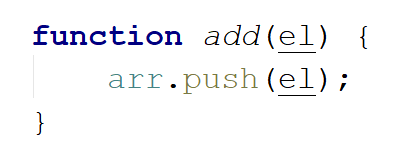
Then we loop through the commands array and obtain **each element** from the command and cast both numbers. This event is called [**destructuring**](https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Operators/Destructuring_assignment):



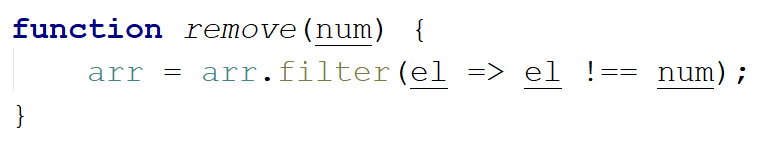
We check if the command is equal to one of the given: "Add", "Remove", etc.



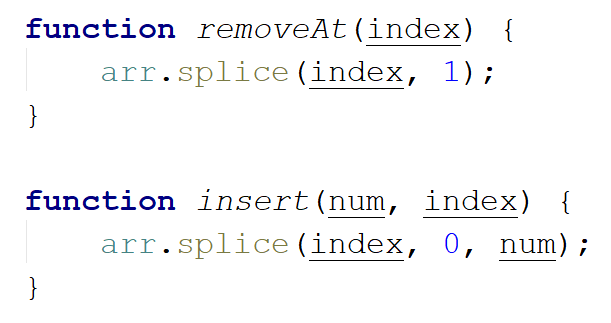
To add element at the end, use **push().**



To remove **all occurrences** of a particular element from the array, you can use **filter().**



To remove at an index or insert at an index, you can use **splice()**



**Note:** *When you remove elements with* **splice()***, you enter two parameters: (****first****: Start index,* ***second:*** *count of elements you want to remove)*

*When you want to insert elements with* **splice()***,you enter three parameters: (****first****: Start Index,* ***second****: count of elements to remove – if none-enter 0,* ***third****: elements to insert)*