# Homework: JavaScript Loops, Arrays, Strings

This document defines the homework assignments from the [“JavaScript Basics“ Course @ Software University](http://softuni.bg/courses/javascript-basics/). Please submit as homework a single zip / rar / 7z archive holding the solutions (source code) of all below described problems.

## Number Checker

Write a JavaScript function **printNumbers(n)** that accepts as parameter **integer n.** The functionfinds **all integer numbers** from 1 to n that are **not divisible by 4 and 5** at the **same time**. Write a JS program **numberChecker.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| 20 | 2, 3, 6, 7, 9, 11, 13, 14, 17, 18, 19 |
| 1 | no |
| 13 | 2, 3, 6, 7, 9, 11, 13 |

## Find Min and Max Number

Write a JavaScript function **findMinAndMax(value)** that accepts as parameter **an array of numbers**. The function finds the **minimum** and the **maximum** number. Write a JS program **minMaxNumbers.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| [1, 2, 1, 15, 20, 5, 7, 31] | Min -> 1  Max -> 31 |
| [2, 2, 2, 2, 2] | Min -> 2  Max -> 2 |
| [500, 1, -23, 0, -300, 28, 35, 12] | Min -> -300  Max -> 500 |

## Properties

Write a JavaScript function **displayProperties(value)** that displays all the properties of the "document" object in alphabetical order.Write a JS program **docProperties.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |
| --- |
| **Output** |
| activeElement  alinkColor  all  …  xmlVersion |

***Note:*** The output above is a sample and may be different in your browser.

## Create Array

Write a JavaScript function **createArray(value)** that **allocates array** of 20 integers and initializes each element by its **index multiplied by 5**. Write JS program **arrayBuilder.js** that invokes your function with the sample input data below and prints the output at the console.

## Compare Chars

Write a JavaScript function **compareChars(value)** that **compares two arrays of chars** lexicographically (letter by letter). Write JS program **charComparer.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| ['1', 'f', '1', 's', 'g', 'j', 'f', 'u', 's', 'q']  ['1', 'f', '1', 's', 'g', 'j', 'f', 'u', 's', 'q'] | Equal |
| ['3', '5', 'g', 'd']  ['5', '3', 'g', 'd'] | Not Equal |
| ['q', 'g', 'q', 'h', 'a', 'k', 'u', '8', '}', 'q', '.', 'h', '|', ';']  ['6', 'f', 'w', 'q', ':', '”', 'd', '}', ']', 's', 'r'] | Not Equal |

## Maximal Sequence

Write a JavaScript function **findMaxSequence(value)** that finds the **maximal sequence of equal elements** in an array and returns the **result as an array**. If there is more than one sequence with the same maximal length, print the **rightmost** one.Write JS program **sequenceFinder.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| [2, 1, 1, 2, 3, 3, 2, 2, 2, 1] | [2, 2, 2] |
| ['happy'] | ['happy'] |
| [2, 'qwe', 'qwe', 3, 3, '3'] | [3, 3] |

## Maximal Increasing Sequence

Write a JavaScript function **findMaxSequence(value)** that finds the **maximal increasing sequence** in an array of numbers and returns the **result as an array**. If there is no increasing sequence the function **returns 'no'**.Write JS program **maxSequenceFinder.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| [3, 2, 3, 4, 2, 2, 4] | [2, 3, 4] |
| [3, 5, 4, 6, 1, 2, 3, 6, 10, 32] | [1, 2, 3, 6, 10, 32] |
| [3, 2, 1] | no |

## Sort Array

Sorting an array means to arrange its elements in increasing order.Write a JavaScript function **sortArray(value)** to **sort an array**. Use the **"selection sort"** algorithm: find the smallest element, move it at the first position, find the smallest from the rest, move it at the second position, etc. Write JS program **arraySorter.js** that invokes your function with the sample input data below and prints the output at the console. Use a second array. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| [5, 4, 3, 2, 1] | 1, 2, 3, 4, 5 |
| [12, 12, 50, 2, 6, 22, 51, 712, 6, 3, 3] | 2, 3, 3, 6, 6, 12, 12, 22, 50, 51, 712 |

## Most Frequent Number

Write a JavaScript function **findMostFreqNum(value)** that finds the **most frequent number** in an array. If multiple numbers appear the same maximal number of times, print the **leftmost** of them. Write JS program **numberFinder.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| [4, 1, 1, 4, 2, 3, 4, 4, 1, 2, 4, 9, 3] | 4 (5 times) |
| [2, 1, 1, 5, 7, 1, 2, 5, 7, 3, 87, 2, 12, 634, 123, 51, 1] | 1 (4 times) |
| [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13] | 1 (1 times) |

## Reverse String

Write a JavaScript function **reverseString(value)** that **reverses string and returns it**. Write JS program **stringReverser.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| 'sample' | elpmas |
| 'softUni' | inUtfos |
| 'java script' | tpircs avaj |

## Check the Brackets

Write a JavaScript function **checkBrackets(value)** **to check if in a given expression the brackets are put correctly**. Write JS program **bracketsChecker.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| '( ( a + b ) / 5 – d )' | correct |
| ') ( a + b ) )' | incorrect |
| '( b \* ( c + d \*2 / ( 2 + ( 12 – c / ( a + 3 ) ) ) )' | incorrect |

## Substring Count

Write a JavaScript function **countSubstringOccur(value)** that accepts as parameter an array of 2 elements **arr [keyword, text]. The function finds how many times a substring is contained in a given text (perform case insensitive search).** Write JS program **substringSearch.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| ['in', 'We are living in a yellow submarine. We don't have anything else. Inside the submarine is very tight. So we are drinking all the day. We will move out of it in 5 days.'] | 9 |
| ['your', 'No one heard a single word you said. They should have seen it in your eyes. What was going around your head.'] | 2 |
| ['but', 'But you were living in another world tryin' to get your message through.'] | 1 |

## Replace the White-Spaces

Write a JavaScript function **replaceSpaces(value)** that replaces the **white-space characters** in a text with **&nbsp;**. Write JS program **spaceReplacer.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| 'But you were living in another world tryin' to get your message through' | Butyouwerelivinginanotherworldtryin'togetyourmessagethrough |

## Palindromes

Write a JavaScript function **findPalindromes(value)** that extracts from a given text **all palindromes**, e.g. "ABBA", "lamal", "exe". Write JS program **palindromesExtract.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| 'There is a man, his name was Bob.' | a, bob |

## Most Frequent Word

Write a JavaScript function **findMostFreqWord(value)** that **finds the most frequent word** in a text and prints it, as well as **how many times it appears** in format "**word -> count**". Consider any non-letter character as a word separator. Ignore the character casing. If several words have the same maximal frequency, print all of them in alphabetical order. Write JS program **frequentWord.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| 'in the middle of the night' | the -> 2 times |
| 'Welcome to SoftUni. Welcome to Java. Welcome everyone.' | welcome -> 3 times |
| 'Hello my friend, hello my darling. Come on, come here. Welcome, welcome darling.' | come -> 2 times  darling -> 2 times  hello -> 2 times  my -> 2 times  welcome -> 2 times |

## Cards Frequencies

Write a JavaScript function **findCardFrequency(value)** that that accepts the following parameters: array of several cards (face + suit), separated by a space. The function calculates and prints at the console the frequency of each card face in format "**card\_face -> frequency**". The frequency is calculated by the formula **appearances / N** and is expressed in percentages with exactly 2 digits after the decimal point. The card faces with their frequency should be printed in the order of the card face's **first appearance** in the input. The same card can appear multiple times in the input, but its face should be listed only once in the output. Write JS program **cardFrequencies.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| '8♥ 2♣ 4♦ 10♦ J♥ A♠ K♦ 10♥ K♠ K♦' | 8 -> 10.00%  2 -> 10.00%  4 -> 10.00%  10 -> 20.00%  J -> 10.00%  A -> 10.00%  K -> 30.00% |
| 'J♥ 2♣ 2♦ 2♥ 2♦ 2♠ 2♦ J♥ 2♠' | J -> 22.22%  2 -> 77.78% |
| '10♣ 10♥' | 10 -> 100.00% |

# Problems for Champions

The next few problems are not mandatory. Implement them to challenge your skills.

## \* Extract Element Content

Write a JavaScript function **extractContent(value)** that extracts the **text content from given HTML fragment** (given as string). The function should return anything that is in a tag, **without the tags.** Write JS program **contentExtracter.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| '<p>Hello</p><a href='http://w3c.org'>W3C</a>' | HelloW3C |

***Hint:*** Create an element and use its **innerHTML** and **innerText** properties.

## \*Replace <a> Tag

Write a JavaScript function **replaceATag(value)** that replaces in a HTML document given as string **all the tags <a href="…">…</a>** with corresponding **tags [URL=…]…/URL]**.Write JS program **aTagReplacer.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| '<ul>  <li>  <a href=<http://softuni.bg>>SoftUni</a>  </li>  </ul>' | <ul>  <li>  [URL href=<http://softuni.bg>]SoftUni[/URL]  </li>  </ul> |

## \*\*Text Modifier

Write a JavaScript function **fixCasing(value)** that accepts a text as a parameter. The function must **change the text in all regions** as follows:

* <upcase>text</upcase> to uppercase
* <lowcase>text</lowcase> to lowercase
* <mixcase>text</mixcase> to mixed casing (randomly)

Write JS program **caseFixer.js** that invokes your function with the sample input data below and prints the output at the console. Examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| 'We are <mixcase>living</mixcase> in a <upcase>yellow submarine</upcase>. We <mixcase>don't</mixcase> have <lowcase>anything</lowcase> else.' | We are LiVinG in a YELLOW SUBMARINE. We dOn'T have anything else. |