Write a JavaScript program to find all the index positions of a given word within a given string.

```
function findAllIndexes(str, word) { let indexes = [];
let index = -1;
while ((index = str.indexOf(word, index + 1)) !== -1) { indexes.push(index);
}
return indexes;
}
let string = "hello world hello"; let word = "world";
let positions = findAllIndexes(string, word);
console.log("The word '" + word + "' appears at positions: " + positions.join(", "));
```

Write a JavaScript program to find the first index of a given element in an array using the linear search algorithm.

```
function linearSearch(arr, element) { for (let i = 0; i < arr.length; i++) {
if (arr[i] === element) {
return i;
}
}
return -1;
}
```

Write a JavaScript program to sort a list of elements using Quick sort.

```
function quickSort(arr) {
if (arr.length <= 1) { return arr;
}
const pivot = arr[Math.floor(arr.length / 2)]; const left = [];
const right = [];

for (let i = 0; i < arr.length; i++) {

if (i === Math.floor(arr.length / 2)) { continue;

}

if (arr[i] < pivot) { left.push(arr[i]);

} else { right.push(arr[i]);

}

}

return [...quickSort(left), pivot, ...quickSort(right)];

}

// Example usage:

const arr = [5, 3, 7, 2, 8, 4, 1]; const sortedArr = quickSort(arr);

console.log("Sorted array:", sortedArr);
```

Write a JavaScript program to sort a list of elements using Merge sort.

```
function merge_Arrays(left_sub_array, right_sub_array) { let array = []

while (left_sub_array.length && right_sub_array.length) { if (left_sub_array[0] < right_sub_array[0]) {
array.push(left_sub_array.shift())

} else { array.push(right_sub_array.shift())

}

}

return [ ...array, ...left_sub_array, ...right_sub_array ]

}

function merge_sort(unsorted_Array) {

const middle_index = unsorted_Array.length / 2 if(unsorted_Array.length < 2) {

return unsorted_Array

}

const left_sub_array = unsorted_Array.splice(0, middle_index)

return merge_Arrays(merge_sort(left_sub_array),merge_sort(unsorted_Array))

}

unsorted_Array = [39, 28, 44, 4, 10, 83, 11];
```

```
console.log("The sorted array will be: ",merge_sort(unsorted_Array));
```

Write a JavaScript program to sort a list of elements using Heap sort.

```
function customSort(arr) { var N = arr.length;
for (var i = Math.floor(N / 2) - 1; i >= 0; i--) customHeapify(arr, N, i);
for (var i = N - 1; i > 0; i--) { var temp = arr[0];
arr[0] = arr[i]; arr[i] = temp;
customHeapify(arr, i, 0);
}
}
function customHeapify(arr, N, i) { var largest = i;
var l = 2 * i + 1; var r = 2 * i + 2;
if (l < N && arr[l] > arr[largest]) largest = l;
if (r < N && arr[r] > arr[largest]) largest = r;
if (largest != i) { var swap = arr[i]; arr[i] = arr[largest];
arr[largest] = swap; customHeapify(arr, N, largest);
}
}
function customPrintArray(arr) { var N = arr.length;
for (var i = 0; i < N; ++i) console.log(arr[i]);
}
var originalArr = [12, 11, 13, 5, 6, 7]; customSort(originalArr); console.log("Sorted array:" + originalArr);
```

Write a JavaScript program to sort a list of elements using Insertion sort.

```
function insertionSort(arr) { const n = arr.length;
for (let i = 1; i < n; i++) { let key = arr[i];
let j = i - 1;
while (j >= 0 && arr[j] > key) { arr[j + 1] = arr[j];
j--;
}
arr[j + 1] = key;

}

return arr;

}

// Example usage:

const originalArr = [5, 3, 7, 2, 8, 4, 1]; const sortedArr = insertionSort(originalArr); console.log("Sorted array:", sortedArr);
```

Write a JavaScript program to sort a list of elements using Bubble sort

```
function bubbleSort(arr) { const n = arr.length;

for (let i = 0; i < n - 1; i++) { for (let j = 0; j < n - i - 1; j++) { if (arr[j] > arr[j + 1]) {

// Swap arr[j] and arr[j+1] let temp = arr[j];

arr[j] = arr[j + 1]; arr[j + 1] = temp;

}

}

}

return arr;

}

// Example usage:

const arr = [5, 3, 7, 2, 8, 4, 1]; const sortedArr = bubbleSort(arr);

console.log("Sorted array:", sortedArr);
```

Write a JavaScript program to sort the characters in a string alphabetically.

```
function sortStringAlphabetically(str) { return str.split('').sort().join('');

}

const inputString = "hello world";

const sortedString = sortStringAlphabetically(inputString); console.log("Original string:", inputString); console.log("Sorted string:", sortedString);
```

Write a JavaScript program to check if a numeric array is sorted or not.

```
function isArraySorted(arr) {

for (let i = 0; i < arr.length - 1; i++) { if (arr[i] > arr[i + 1]) {

return false;

}

}

return true;

}

// Example usage:

const sortedArray = [1, 2, 3, 4, 5];

const unsortedArray = [5, 3, 7, 2, 8];

console.log("Is sortedArray sorted?", isArraySorted(sortedArray)); console.log("Is unsortedArray sorted?", isArraySorted(unsortedArray));
```

Write a JavaScript function to validate whether a given value type is null or not.

```
function isNull(value) { return value === null;

}

// Example usage: console.log(isNull(null)); // true console.log(isNull(5)); // false
```

Write a JavaScript function to validate whether a given value is a number or not.

```
function isNumber(value) {

return typeof value === 'number' && !isNaN(value);

}

// Example usage:

console.log(isNumber(5)); // true console.log(isNumber("hello")); // false
```

Write a JavaScript function to validate whether a given value is RegExp or not.

```
function isRegExp(value) {

return Object.prototype.toString.call(value) === '[object RegExp]';

}
```

// Example usage:

console.log(isRegExp(/test/)); // true console.log(isRegExp("hello")); // false

Write a JavaScript program to delete the rollno property from the following object. Also print the object before or after deleting the property.

Sample object:

var student = {

name : "David Rayy", sclass : "VI",

rollno : 12 };

var student = {

name: "David Rayy", sclass: "VI",

rollno: 12

};

console.log("Object before deleting rollno property:", student);

delete student.rollno;

console.log("Object after deleting rollno property:", student);

Write a JavaScript program to display the reading status (i.e. display book name, author name and reading status) of the following books.

var library = [

{

author: 'Bill Gates', title: 'The Road Ahead', readingStatus: true

},

{

author: 'Steve Jobs', title: 'Walter Isaacson', readingStatus: true

},

{

author: 'Suzanne Collins',

title: 'Mockingjay: The Final Book of The Hunger Games', readingStatus: false

```
}];

var library = [

{

author: 'Bill Gates', title: 'The Road Ahead', readingStatus: true

},

{

author: 'Steve Jobs', title: 'Walter Isaacson', readingStatus: true

},

{

author: 'Suzanne Collins',

title: 'Mockingjay: The Final Book of The Hunger Games', readingStatus: false

}

];

for (var i = 0; i < library.length; i++) { var book = library[i];

var bookInfo = "'" + book.title + "'" by " + book.author;

if (book.readingStatus) {

console.log("You have already read " + bookInfo + ".");

} else {

console.log("You haven't read " + bookInfo + " yet.");

}

}
```

-
    1. **Write a JavaScript program to create a clock. Note: The output will come every second. Expected Console Output :**

```
"14:37:42"

"14:37:43"

"14:37:44"

"14:37:45"

"14:37:46"

"14:37:47"
```

```
function displayTime() {

var date = new Date();
```