

TY. B. Tech. (Sem-II)

CS3215 : Web Technology

Assignment No: 5- Write a JavaScript program to reverse the elements of a given array. Perform Sorting and Searching operations

<u>Roll. No.</u>	<u>Gr. No.</u>	<u>Div</u>	<u>Batch</u>	<u>Name</u>
62	12120238	D	1	Tanaya Naik

Theory: Following are the built in functions for sorting an element of an array. But for this assignment you are no permitted to use in built in functions.

Sorting an Array

The `sort()` method sorts an array alphabetically:

Example

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];
fruits.sort();    // Sorts the elements of fruits
```

Reversing an Array

The `reverse()` method reverses the elements in an array.

You can use it to sort an array in descending order:

Example

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];
fruits.sort();    // First sort the elements of fruits
fruits.reverse(); // Then reverse the order of the element
```

Numeric Sort

By default, the `sort()` function sorts values as **strings**.

However, if numbers are sorted as strings, "25" is bigger than "100", because "2" is bigger than "1".

Example

```
var points = [40, 100, 1, 5, 25, 10];
points.sort(function(a, b){return a - b});
```

Example

```
var points = [40, 100, 1, 5, 25, 10];
points.sort(function(a, b){return b - a});
```

Array.map()

Array.filter()

Array.reduce()

Array.reduceRight()

Array.every()

Array.some()

Array.indexOf()

Array.lastIndexOf()

Array.find()

Array.findIndex()

Code:

Array.html

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head>
```

```
  <meta charset="UTF-8">
```

```
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
```

```
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
```

```
  <script type="text/javascript" src="Arrayfunctions.js">
```

```
  </script>
```

```
  <link rel="stylesheet" href="Arrayfunctions.css">
```

```
  <title>Lab 5</title>
```

```
</head>
```

```
<body>
```

```
  <h2>JavaScript Array Operations</h2>
```

```
  <div class="full">
```

```
    <div class="left">
```

```
      <h3>For Integer values:</h3><br>
```

```
      <input id="iin" type="text" name="input" placeholder="Enter Array elements seperated by spaces"><br><br>
```

```
      <h4>Inbuilt Functions:</h4><br>
```

```
      <input type="button" value="Sort: Ascending" onclick="op1()"><input type="button" value="Sort: Descending" onclick="op2()">
```

```
      <input type="button" value="Find Array Size" onclick="op3()"><input type="button" value="Reverse the Array" onclick="op4()">
```

```

        <input id = "ele" type="text" name = "element" placeholder="Enter element to search"><input type =
"button" value = "Search" onclick = "op5()">
        <br><br>
        <p id="idef"></p>
        <p id="ians"></p>
        <br><br>
        <h4>Defined Functions:</h4><br>
        <input type = "button" value = "Bubble Sort: Ascending" onclick = "op11()"><input type = "button"
value = "Quick Sort: Ascending" onclick = "op12()">
        <input type = "button" value = "Bubble Sort: Descending" onclick = "op13()"><input type = "button"
value = "Quick Sort: Descending" onclick = "op14()">
        <input id = "ele1" type="text" name = "element" placeholder="Enter element to search"><input type =
"button" value = "Linear Search" onclick = "op15()">
        <input type = "button" value = "Binary Search" onclick = "op16()"><input type = "button" value =
"Reverse the Array" onclick = "op17()">
        <br>
        <br>
        <p id="idef1"></p>
        <p id="ians1"></p>
    </div>
    <div class="right">
        <h3>For String and char values:</h3><br>
        <input id = "sin" type="text" name = "input" placeholder="Enter Array elements seperated by
spaces"><br><br>
        <h4>Inbuilt Functions:</h4><br>
        <input type = "button" value = "Sort: Ascending" onclick = "op6()"><input type = "button" value =
"Sort: Descending" onclick = "op7()">
        <input type = "button" value = "Find Array Size" onclick = "op8()"><input type = "button" value =
"Reverse the Array" onclick = "op9()">
        <input id = "sele" type="text" name = "element" placeholder="Enter element to search"><input type =
"button" value = "Search" onclick = "op10()">
        <br><br>
        <p id="sdef"></p>
        <p id="sans"></p>
        <br><br>
        <h4>Defined Functions:</h4><br>
        <input type = "button" value = "Bubble Sort: Ascending" onclick = "op18()"><input type = "button"
value = "Quick Sort: Ascending" onclick = "op19()">
        <input type = "button" value = "Bubble Sort: Descending" onclick = "op20()"><input type = "button"
value = "Quick Sort: Descending" onclick = "op21()">
        <input id = "sele1" type="text" name = "element" placeholder="Enter element to search"><input type =
"button" value = "Linear Search" onclick = "op22()">
        <input type = "button" value = "Binary Search" onclick = "op23()"><input type = "button" value =
"Reverse the Array" onclick = "op24()">
        <br><br>
        <p id="sdef1"></p>
        <p id="sans1"></p>
    </div>
</div>
</html>

```

Array.css

```
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}

body{
  background-color: rgb(207, 172, 127);
}

input[name = input] {
  width: 100%;
}
input{
  width: 49%;
  text-align: center;
  padding: 5px 5px;
  margin: 2px 2px;
  border-radius: 5px;
}
input[type=button]{
  width: 49%;
  cursor: pointer;
  background-color:rgb(250, 250, 144);
  border: solid 1px;
  font-family: Verdana, Geneva, Tahoma, sans-serif;
}
.full {
  display: flex;
  flex-direction: column;
  justify-content: center;
  align-items: center;
}
.left {
  position: initial;
  padding: 20px;
  background-color: rgb(202, 228, 252);
}
.right {
  position: initial;
  padding: 20px;
  background-color:rgb(240, 184, 232);
}
h2{
  text-align: center;
  background-color: lightsalmon;
  font-family: Arial, Helvetica, sans-serif;
```

```

color: black;
padding: 10px;
margin: auto;
}
h3{
text-align: center;
}
h4{
text-decoration:underline;
}
p{
align-items: center;
text-align: center;
font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
}
#idef, #sdef, #idef1, #sdef1{
background-color:orange;
color:black;
}
#ians, #sans, #ians1, #sans1{
background-color: ghostwhite;
color: black;
}

```

Array.js

```

function op1(){
var str=document.getElementById("iin").value;
const array1 = str.split(" ");
document.getElementById("idef").innerHTML = "The Array after sorting in acending order is:";
document.getElementById("ians").innerHTML = array1.sort(function(a, b){return a-b});
}

function op2(){
var str=document.getElementById("iin").value;
const array1 = str.split(" ");
document.getElementById("idef").innerHTML = "The Array after sorting in decending order is:";
document.getElementById("ians").innerHTML = array1.sort(function(a, b){return b-a});
}

function op3(){
var str=document.getElementById("iin").value;
const array1 = str.split(" ");
document.getElementById("idef").innerHTML = "The size of Array is:";
document.getElementById("ians").innerHTML = array1.length;
}

function op4(){
var str=document.getElementById("iin").value;
const array1 = str.split(" ");
document.getElementById("idef").innerHTML = "The Reverse of Array is:";
}

```

```

    document.getElementById("ians").innerHTML = array1.reverse();
}

function op5(){
    var str=document.getElementById("iin").value;
    const array1 = str.split(" ");
    var req=document.getElementById("ele").value;
    document.getElementById("idef").innerHTML = "The result of search function on Array is:";
    function check(x) {
        return x == req;
    }
    var ans=array1.findIndex(check);

    if(ans===-1){
        document.getElementById("ians").innerHTML = req+" is not present in the given array";
    } else{
        document.getElementById("ians").innerHTML = req+" is present at index "+ans+" in the given Array";
    }
}

function op6(){
    var str=document.getElementById("sin").value;
    const array1 = str.split(" ");
    document.getElementById("sdef").innerHTML = "The Array after sorting in acending order is:";
    document.getElementById("sans").innerHTML = array1.sort();
}

function op7(){
    var str=document.getElementById("sin").value;
    const array1 = str.split(" ");
    document.getElementById("sdef").innerHTML = "The Array after sorting in decending order is:";
    document.getElementById("sans").innerHTML = (array1.sort()).reverse();
}

function op8(){
    var str=document.getElementById("sin").value;
    const array1 = str.split(" ");
    document.getElementById("sdef").innerHTML = "The size of Array is:";
    document.getElementById("sans").innerHTML = array1.length;
}

function op9(){
    var str=document.getElementById("sin").value;
    const array1 = str.split(" ");
    document.getElementById("sdef").innerHTML = "The Reverse of Array is:";
    document.getElementById("sans").innerHTML = array1.reverse();
}

function op10(){
    var str=document.getElementById("sin").value;

```

```

const array1 = str.split(" ");
var req=document.getElementById("sele").value;
document.getElementById("sdef").innerHTML = "The result of search function on Array is:";
function check(x) {
    return x == req;
}
var ans=array1.findIndex(check);

if(ans===-1){
    document.getElementById("sans").innerHTML = req+" is not present in the given array";
} else{
    document.getElementById("sans").innerHTML = req+" is present at index "+ans+" in the given Array";
}
}

function op11(){
    var str=document.getElementById("iin").value;
    const array1 = str.split(" ");

    for(var i=0;i<=array1.length-1;i++){
        for(var j=0;j<(array1.length-i-1);j++){
            if(parseInt(array1[j])>parseInt(array1[j+1])){
                var temp=array1[j];
                array1[j]=array1[j+1];
                array1[j+1]=temp;
            }
        }
    }
    document.getElementById("idef1").innerHTML = "The Array after Bubble sort (acending order) is:";
    document.getElementById("ians1").innerHTML = array1;
}

function op12(){
    var str=document.getElementById("iin").value;
    const array1 = str.split(" ");

    function Quicksort(array){
        if (array.length < 2){
            return array;
        }
        let pivot_element = array[array.length - 1]
        let left_sub_array = [];
        let right_sub_array = [];
        for (let i = 0; i < array.length - 1; i++){
            if (parseInt(array[i]) < parseInt(pivot_element)) {
                left_sub_array.push(array[i])
            } else {
                right_sub_array.push(array[i])
            }
        }
    }
}

```

```

    return [...Quicksort(left_sub_array), pivot_element, ...Quicksort(right_sub_array)];
}

document.getElementById("idef1").innerHTML = "The Array after Quick sort (acending order) is:";
document.getElementById("ians1").innerHTML = Quicksort(array1);
}

function op13(){
    var str=document.getElementById("iin").value;
    const array1 = str.split(" ");

    for(var i=0;i<array1.length;i++){
        for(var j=0;j<array1.length-i-1;j++){
            if(parseInt(array1[j])<parseInt(array1[j+1])){
                var temp= array1[j];
                array1[j]=array1[j+1];
                array1[j+1]=temp;
            }
        }
    }

    document.getElementById("idef1").innerHTML = "The Array after Bubble sort (decending order) is:";
    document.getElementById("ians1").innerHTML = array1;
}

function op14(){
    var str=document.getElementById("iin").value;
    const array1 = str.split(" ");

    function Quicksort(array){
        if (array.length < 2){
            return array;
        }
        let pivot_element = array[array.length - 1]
        let left_sub_array = [];
        let right_sub_array = [];
        for (let i = 0; i < array.length - 1; i++){
            if (parseInt(array[i]) > parseInt(pivot_element)) {
                left_sub_array.push(array[i])
            } else {
                right_sub_array.push(array[i])
            }
        }
        return [...Quicksort(left_sub_array), pivot_element, ...Quicksort(right_sub_array)];
    }

    document.getElementById("idef1").innerHTML = "The Array after Quick sort (decending order) is:";
    document.getElementById("ians1").innerHTML = Quicksort(array1);
}

function op15(){

```



```

var str=document.getElementById("iin").value;
const array1 = str.split(" ");
var req=document.getElementById("ele1").value;
document.getElementById("idef1").innerHTML = "The result of Linear search on Array is:";
var i=0,f=0;
for (i=0; i<array1.length; i++) {
    if (array1[i]===req) {
        f=1;
        break;
    }
}

if(f==0){
    document.getElementById("ians1").innerHTML = req+" is not present in the given array";
} else{
    document.getElementById("ians1").innerHTML = req+" is present at index "+i+" in the given Array";
}
}

function op16(){
    var str=document.getElementById("iin").value;
    const array1 = str.split(" ");
    var req=document.getElementById("ele1").value;
    document.getElementById("idef1").innerHTML = "The result of Binary search on Array is:";

    const binarySearch = (arr = [], num) => {
        let l = 0;
        let r = arr.length - 1;
        while(l <= r){
            const mid = Math.floor((l + r) / 2); if(num == arr[mid]){
                return mid;
            }
            else if(num < arr[mid]){
                r = mid - 1;
            }
            else{
                l = mid + 1;
            };
        };
        return -1
    };

    var f=binarySearch(array1.sort(function(a, b){return a-b}),req);

    if(f==1){
        document.getElementById("ians1").innerHTML = req+" is not present in the given array";
    } else{
        document.getElementById("ians1").innerHTML = req+" is present in the given Array";
    }
}

```

```

function op17(){
  var str=document.getElementById("iin").value;
  const array1 = str.split(" ");
  document.getElementById("idef1").innerHTML = "The Reverse of Array is:";

  const reversedArray = []
  for(let i = array1.length - 1; i >= 0; i--) {
    const value = array1[i];
    reversedArray.push(value);
  }
  document.getElementById("ians1").innerHTML = reversedArray;
}

function op18(){
  var str=document.getElementById("sin").value;
  const array1 = str.split(" ");
  for (let j=0; j<array1.length-1; j++) {
    for (let i=j+1; i<array1.length; i++) {
      if (array1[j].localeCompare(array1[i])>0) {
        var temp = array1[j];
        array1[j] = array1[i];
        array1[i] = temp;
      }
    }
  }
  document.getElementById("sdef1").innerHTML = "The Array after Bubble sort (acending order) is:";
  document.getElementById("sans1").innerHTML = array1;
}

function op19(){
  var str=document.getElementById("sin").value;
  const array1 = str.split(" ");

  function Quicksort(array){
    if (array.length < 2){
      return array;
    }
    let pivot_element = array[array.length - 1]
    let left_sub_array = [];
    let right_sub_array = [];
    for (let i = 0; i < array.length - 1; i++){
      if (array[i] < pivot_element) {
        left_sub_array.push(array[i])
      } else {
        right_sub_array.push(array[i])
      }
    }
    return [...Quicksort(left_sub_array), pivot_element, ...Quicksort(right_sub_array)];
  }
}

```

```

document.getElementById("sdef1").innerHTML = "The Array after Quick sort (acending order) is:";
document.getElementById("sans1").innerHTML = Quicksort(array1);
}

function op20(){
  var str=document.getElementById("sin").value;
  const array1 = str.split(" ");
  for (let j=0; j<array1.length-1; j++) {
    for (let i=j+1; i<array1.length; i++) {
      if (array1[j].localeCompare(array1[i])<0) {
        var temp = array1[j];
        array1[j] = array1[i];
        array1[i] = temp;
      }
    }
  }
  document.getElementById("sdef1").innerHTML = "The Array after Bubble sort (decending order) is:";
  document.getElementById("sans1").innerHTML = array1;
}

function op21(){
  var str=document.getElementById("sin").value;
  const array1 = str.split(" ");

  function Quicksort(array){
    if (array.length < 2){
      return array;
    }
    let pivot_element = array[array.length - 1]
    let left_sub_array = [];
    let right_sub_array = [];
    for (let i = 0; i < array.length - 1; i++){
      if (array[i] > pivot_element) {
        left_sub_array.push(array[i])
      } else {
        right_sub_array.push(array[i])
      }
    }
    return [...Quicksort(left_sub_array), pivot_element, ...Quicksort(right_sub_array)];
  }

  document.getElementById("sdef1").innerHTML = "The Array after Quick sort (acending order) is:";
  document.getElementById("sans1").innerHTML = Quicksort(array1);
}

function op22(){
  var str=document.getElementById("sin").value;
  const array1 = str.split(" ");
  var req=document.getElementById("sele1").value;

```

```

document.getElementById("sdef1").innerHTML = "The result of Linear search on Array is:";
var i=0,f=0;
for (i=0; i<array1.length; i++) {
    if (array1[i]===req) {
        f=1;
        break;
    }
}

if(f==0){
    document.getElementById("sans1").innerHTML = req+" is not present in the given array";
} else{
    document.getElementById("sans1").innerHTML = req+" is present at index "+i+" in the given Array";
}
}

function op23(){
    var str=document.getElementById("sin").value;
    const array1 = str.split(" ");
    var req=document.getElementById("sele1").value;
    document.getElementById("sdef1").innerHTML = "The result of Binary search on Array is:";

    const binarySearch = (arr = [], num) => {
        let l = 0;
        let r = arr.length - 1;
        while(l <= r){
            const mid = Math.floor((l + r) / 2); if(num === arr[mid]){
                return mid;
            }
            else if(num < arr[mid]){
                r = mid - 1;
            }
            else{
                l = mid + 1;
            }
        };
        return -1
    };

    var f=binarySearch(array1.sort(function(a, b){return a-b}),req);

    if(f===-1){
        document.getElementById("sans1").innerHTML = req+" is not present in the given array";
    } else{
        document.getElementById("sans1").innerHTML = req+" is present in the given Array";
    }
}

function op24(){
    var str=document.getElementById("sin").value;

```

```
const array1 = str.split(" ");
document.getElementById("sdef1").innerHTML = "The Reverse of Array is:";

const reversedArray = []
for(let i = array1.length - 1; i >= 0; i--) {
  const value = array1[i];
  reversedArray.push(value);
}
document.getElementById("sans1").innerHTML = reversedArray;
}
```

Output:

JavaScript Array Operations

For Integer values:

1 5 2 8 9 6 7

Inbuilt Functions:

Sort: Ascending

Sort: Descending

Find Array Size

Reverse the Array

Enter element to search

Search

The Array after sorting in ascending order is:

1,2,5,6,7,8,9

Defined Functions:

Bubble Sort: Ascending

Quick Sort: Ascending

Bubble Sort: Descending

Quick Sort: Descending

3

Linear Search

Binary Search

Reverse the Array

The result of Linear search on Array is:

3 is not present in the given array

For String and char values:

s b y u o p a

Inbuilt Functions:

Sort: Ascending

Sort: Descending

Find Array Size

Reverse the Array

a

Search

The result of search function on Array is:

a is present at index 6 in the given Array

Defined Functions:

Bubble Sort: Ascending

Quick Sort: Ascending

Bubble Sort: Descending

Quick Sort: Descending

Enter element to search

Linear Search

Binary Search

Reverse the Array

The Reverse of Array is:

a,p,o,u,y,b,s