## 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**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Roll. No.** | **Gr. No.** | **Div** | **Batch** | **Name** |
| **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:**

