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Department of Electronics and Telecommunication Engineering.



LAB MANUAL

For

JAVA SCRIPT

B.E. (E&TC Engg.) 2019 Course
Savitribai Phule Pune University,
Pune

Electronics and Telecommunication
Engineering



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List of Experiments

Class: B.E.

Sub.: JAVA SCRIPT

Sr. No.	Experiment
1	Write a JavaScript program to calculate area of triangle, area of rectangle and area of circle
2	Write a JavaScript program to generate the multiplication table of a given number.
3	Write a JavaScript program to following operations on a given string, i. Reverse string ii. Replace characters of a string iii. String is Palindrome
4	Write a JavaScript program to compare two strings using various methods.
5	Write a JavaScript program that will create a countdown timer.
6	Write a JavaScript program that will create an array and perform following operations i. To remove specific element from the array ii. Check if an array contains a specified value. iii. To empty an array
7	Write a JavaScript program to illustrate different Set operations like- a. Union b. Intersection c. Difference d. Set Difference
8	Write a JavaScript program to create a Home page of any website and change background color using i. On mouse over event ii. On focus event
9	Design and implement a simple calculator using Java script for operations like addition, multiplication, subtraction, division, square of a number etc. a. Design a calculator like text field for input and output, buttons for numbers and operations etc. b. Validate input values c. Prompt/ alerts for invalid values etc.



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Experiment No. 1

Title: Write a JavaScript program to calculate area of triangle, area of rectangle and area of circle

Date of Performance:

Roll No:

Date of Submission:

University Seat No:

Signature of Staff:



Experiment No. 1

Calculate Area of Triangle, Rectangle, Circle

Title: calculate area of triangle, area of rectangle and area of circle using Java Script.

Aim: Write a JavaScript program to calculate area of triangle, area of rectangle and area of circle.

Software: Visual Studio code (VS code)

Theory:

In this example, you'll learn to write a program to calculate the area of a triangle in JavaScript.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript Operators
- JavaScript Math sqrt()

1) Calculate Area of triangle

If you know the base and height of a triangle, you can find the area using the formula:

$$\text{area} = (\text{base} * \text{height}) / 2$$

JAVA Script Code:

```
const baseValue = prompt('Enter the base of a triangle: ');
const heightValue = prompt('Enter the height of a triangle: ');
// calculate the area
const areaValue = (baseValue * heightValue) / 2;
console.log (
  `The area of the triangle is ${areaValue}`
)
```



);

OUTPUT:

Enter the base of a triangle: 4
Enter the height of a triangle: 6
The area of the triangle is 12

2) calculate the area of the rectangle

Area of a rectangle is the amount of space occupied by the rectangle. A rectangle can be defined as the plain figure with two adjacent sides equal in length. The 4 angles present in the rectangle are also equal. A rectangle can be divided into 4 similar square. The measurement of each interior angle in a rectangle is 90 degrees.

Area of a rectangle is the number of square units takes to fill a rectangle completely.

Formula

1. $A = W \times H$

where

A is the area of the rectangle
W is the width of the rectangle
H is the height of the rectangle

Java Script Code:

`<html>`

`<head>`

`<script >`

```
var length = prompt("Enter a whole number for the length of your rectangle.");  
var width = prompt("Enter a whole number for the width of your rectangle.");  
function area(length, width) {  
    return length * width;  
}
```



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```
}  
  
function perimeter(length, width) {  
    return 2*( length + width);  
}  
  
    document.writeln('The area of your rectangle is ' + area(length, width));  
  
    document.writeln('The perimeter of your rectangle is ' + perimeter(length,  
width));  
  
    </script>  
  
</head>  
  
<body>  
  
    </body>  
  
</html>
```

3) Calculate the area of Circle

In this example we will calculate area and circumference of the circle according to given radius. we use the following mathematical formula for calculating area and circumference of the circle In JavaScript:

Area of Circle= radius * radius * PI

circumference of the circle = 2 * radius * PI



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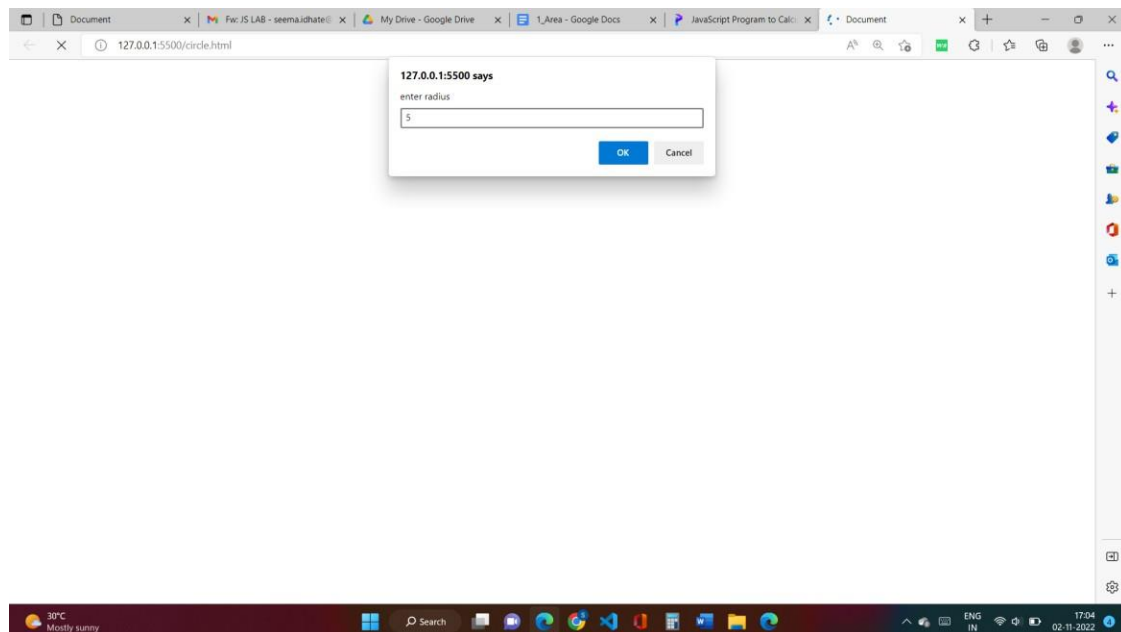
Java script code:

```
<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">
  <title>Document</title>
</head>
<body>
  <script>
//circle
const radius1=prompt('enter radius');
const area1=(3.14*radius1*radius1);

console.log(
  `The area of the circle is ${area1}`
);

  </script>
</body>
</html>
```

//Output:





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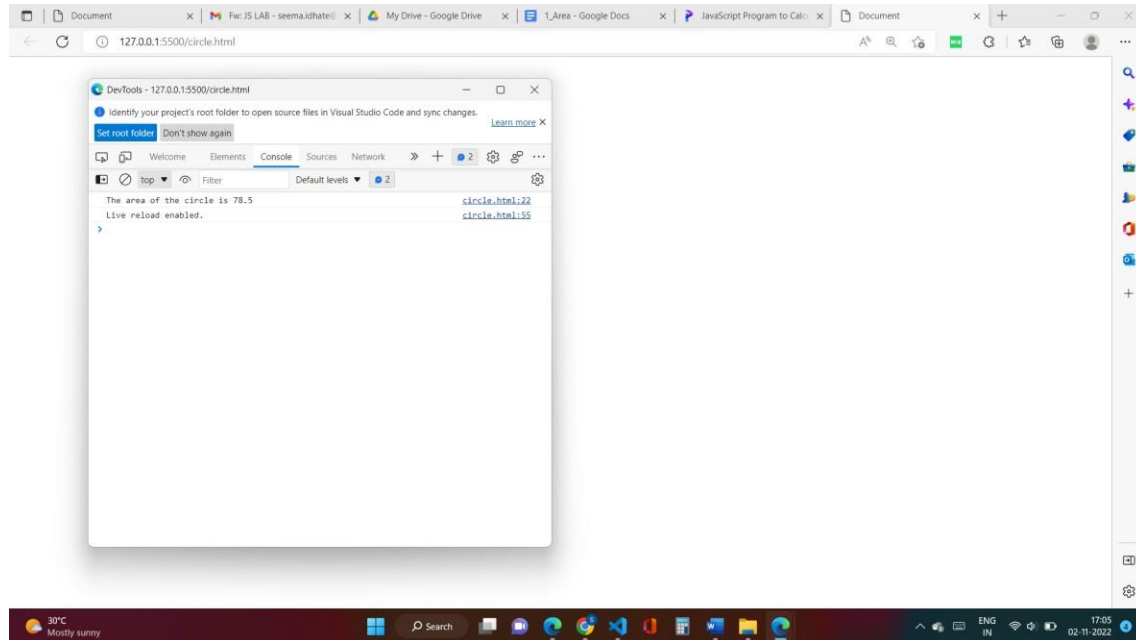
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//Combine Java script code for calculating Area:

```
<!DOCTYPE html>
<html>
<head>
<title>The area of a triangle</title>

<h1>
Calculating Area using JavaScript
</h1>

<list>
<button onclick="area_triangle()" id = "btn1">triangle</button>
<button onclick="area_rectangle()" id = "btn1">rectangle</button>
<button onclick="area_circle()" id = "btn1">circle</button>
</list>

<script>
function area_triangle(){
var side1 = parseInt(prompt("Enter side1 in cm"));
var side2 = parseInt(prompt("Enter side2 in cm"));
var side3 = parseInt(prompt("Enter side3 in cm"));
var s = (side1 + side2 + side3)/2;
var area = Math.sqrt(s*(s-side1)*(s-side2)*(s-side3));
console.log("<br>" + "Area of triangle is " + area.toFixed(2) + "sq.cm.");
document.write("<br>" + "Area of triangle is " + area.toFixed(2) + "sq.cm.");
}
```

JAVA SCRIPT (2019 course) Sem.-I Prof S A Takalkar



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```
function area_rectangle(){
var side1 = parseInt(prompt("Enter side1"));
var side2 = parseInt(prompt("Enter side2"));
var area = side1 * side2;
console.log("<br>" + "Area of triangle is = " + area.toFixed(2) + "sq.cm.");
document.write("<br>" + "Area of rectangle is = " + area.toFixed(2) + "sq.cm.");

}

function area_circle(){

var radius = parseInt(prompt("Enter radius"));
var area = 3.14 * radius * radius;
console.log("<br>" + "Area of triangle is = " + area.toFixed(2) + "sq.cm.");
document.write("<br>" + "Area of circle is = " + area.toFixed(2) + "sq.cm.");

}
</script>

</head>

</html>
```

Conclusion:



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Experiment No. 2

Title: Write a JavaScript program to generate the multiplication table of a given number.

Date of Performance:

Roll No:

Date of Submission:

University Seat No:

Signature of Staff:



Experiment No. 2

Generate the multiplication table of a given number

Title: Generate the multiplication table of a given number.

Aim: Write a JavaScript program to generate the multiplication table of a given number.

Theory:

In this example, you will learn to generate the multiplication table of a number in JavaScript.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript for loop

Java Script Code:

1) Generate the multiplication table of a given number

```
/* program to generate a multiplication table
upto a range */

// take number input from the user
const number = parseInt(prompt('Enter a integer: '));

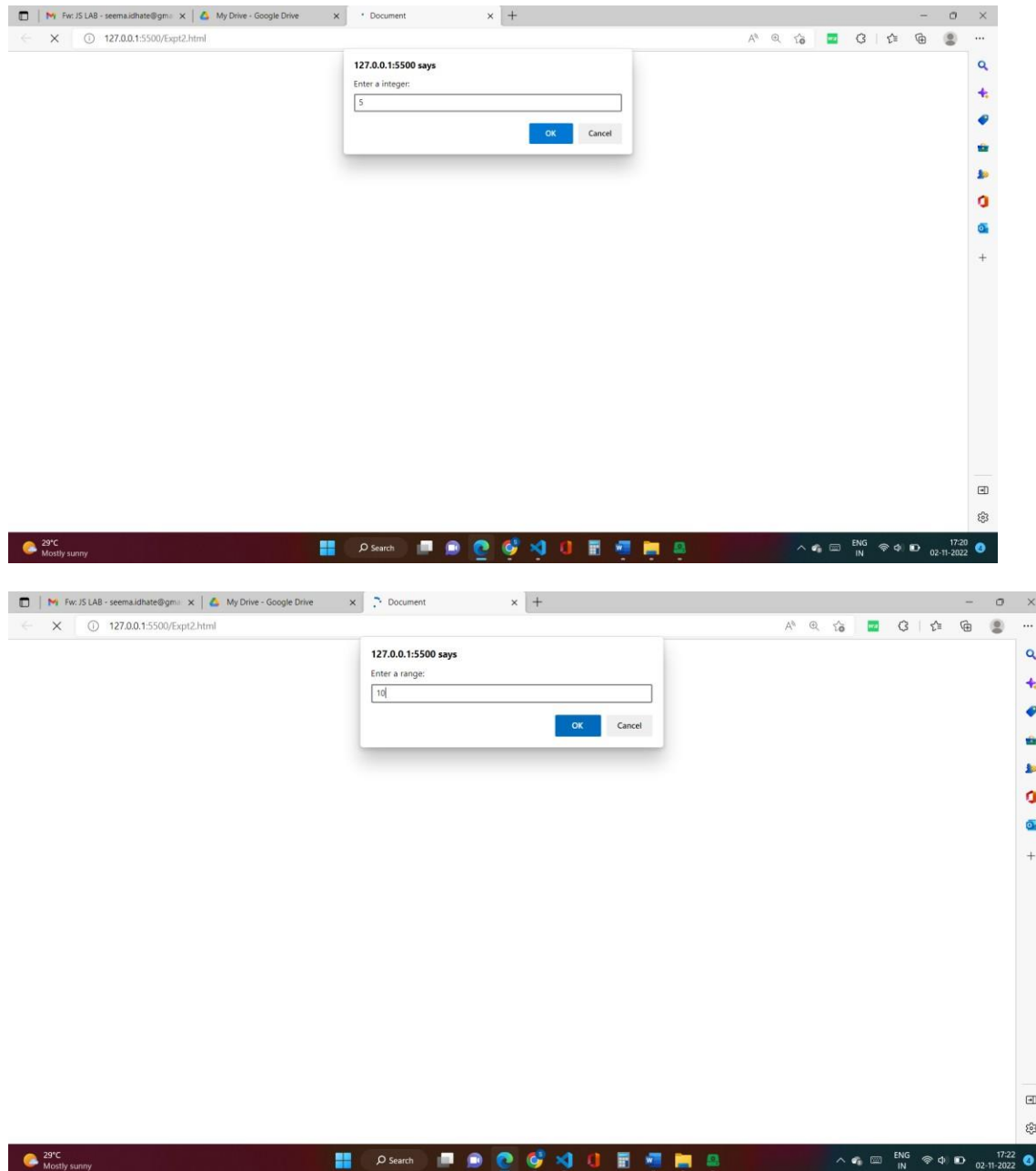
// take range input from the user
const range = parseInt(prompt('Enter a range: '));

//creating a multiplication table
for(let i = 1; i <= range; i++) {
    const result = i * number;
    console.log(`${number} * ${i} = ${result}`);
}
```

Output:

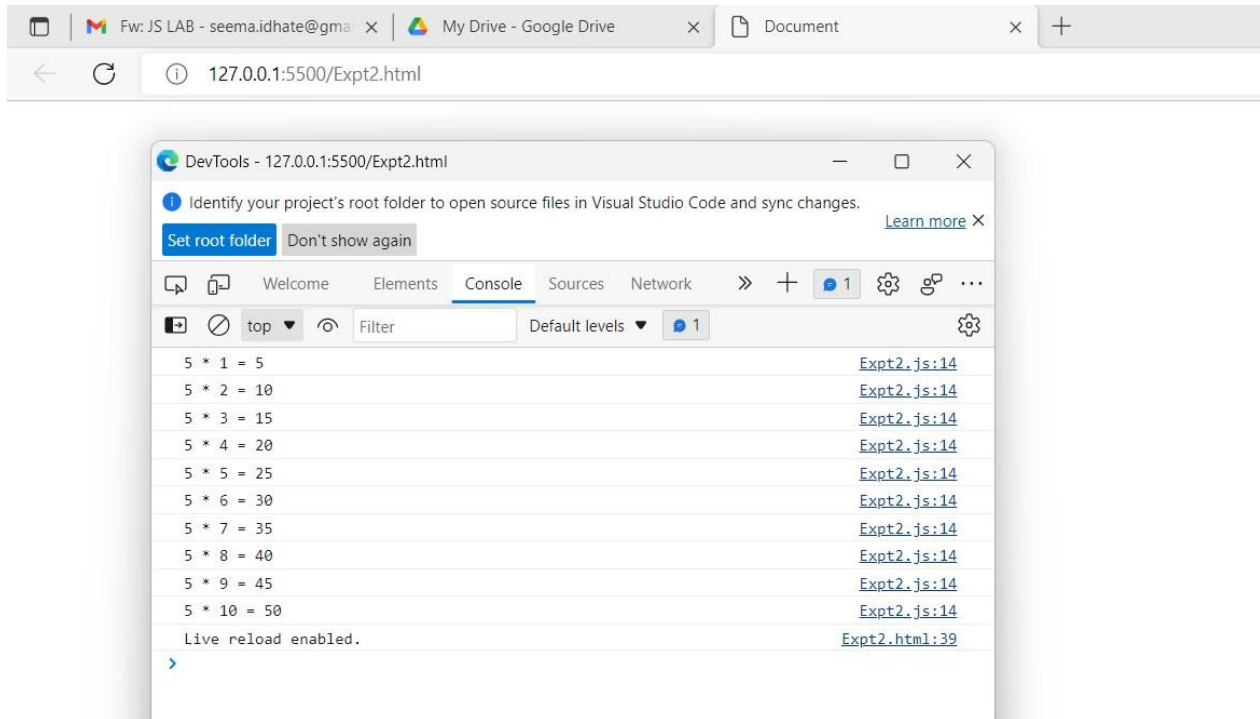


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Conclusion:

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Experiment No. 3

Title: Write a JavaScript program to following operations on a given string,

- i. Reverse string
- ii. Replace characters of a string
- iii. String is Palindrome

Date of Performance:

Roll No:

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Experiment No. 3

Write a JavaScript program to perform operations on a given string.

Title: JavaScript program to

- i. Reverse string
- ii. Replace characters of a string
- iii. String is Palindrome

Aim: Write a JavaScript program to following operations on a given string,

- i. Reverse string
- ii. Replace characters of a string
- iii. String is Palindrome

Theory:

Java script :

```
<!DOCTYPE html>
<html>
<body>

<h2>String</h2>

<button onclick="RevStr()">Reverse a String</button>
<button onclick="ReplChr()">Replace Characters</button>

<p id = "test"></p>
<p id="demo"></p>

<script>
function ReplChr() {
    document.getElementById("test").innerHTML = "Replace all occurrences of M with W in the paragraph :
My Music with Microsoft Apps";
    document.getElementById("demo").innerHTML = "My Music with Microsoft Apps";
    let text = document.getElementById("demo").innerHTML;
    document.getElementById("demo").innerHTML =
    text.replace(/M/g,"W");
}

function RevStr(){

    // empty string
    let revString = "";
    var str = prompt("Enter String");
```



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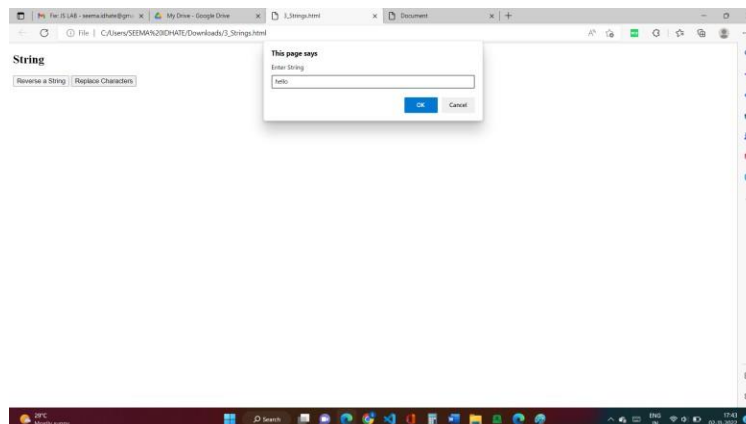
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```
for (let i = str.length - 1; i >= 0; i--) {  
    revString += str[i];  
}  
console.log("Given String = " + str + "<BR>" + "reversed String = " + revString);  
PalStr(str, revString);  
}  
  
function PalStr(str, revString){  
  
    // find the length of a string  
    var i = str.localeCompare(revString);  
    if (i == 0) {  
        console.log('It is a palindrome');  
    }  
    else {  
        console.log('It is not a palindrome');  
    }  
}  
</script>  
  
</body>  
</html>
```

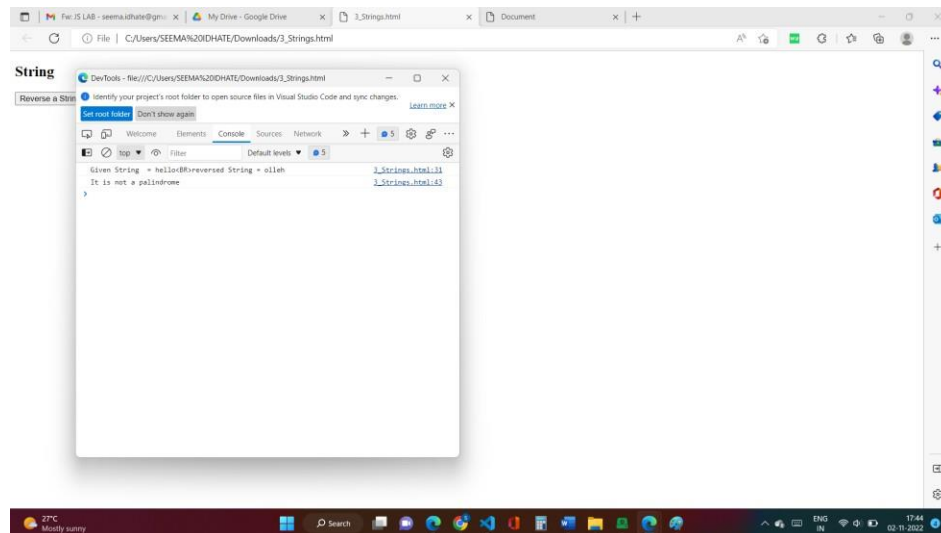
Output:

i) Reverse string:

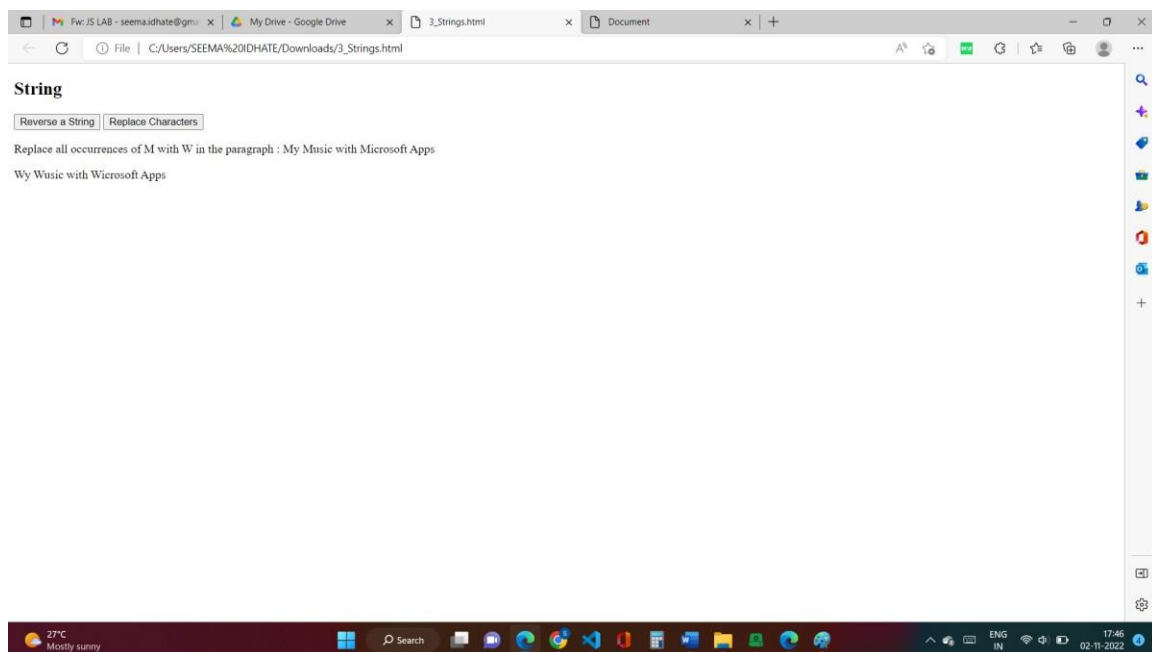




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ii) Replace the Character of string:





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iii)String Palindrome

In this example, you will learn to write a JavaScript program that checks if the string is palindrome or not.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript String
- JavaScript Function and Function Expressions

A string is a palindrome if it is read the same from forward or backward. For example, **dad** reads the same either from forward or backward. So the word **dad** is a palindrome. Similarly, **madam** is also a palindrome.

Check Palindrome Using for Loop:

// program to check if the string is palindrome or not

```
function checkPalindrome(string) {  
  
    // find the length of a string  
    const len = string.length;  
  
    // loop through half of the string  
    for (let i = 0; i < len / 2; i++) {  
  
        // check if first and last string are same  
        if (string[i] !== string[len - 1 - i]) {  
            return 'It is not a palindrome';  
        }  
    }  
    return 'It is a palindrome';  
}  
  
// take input  
const string = prompt('Enter a string: ');  
  
// call the function
```



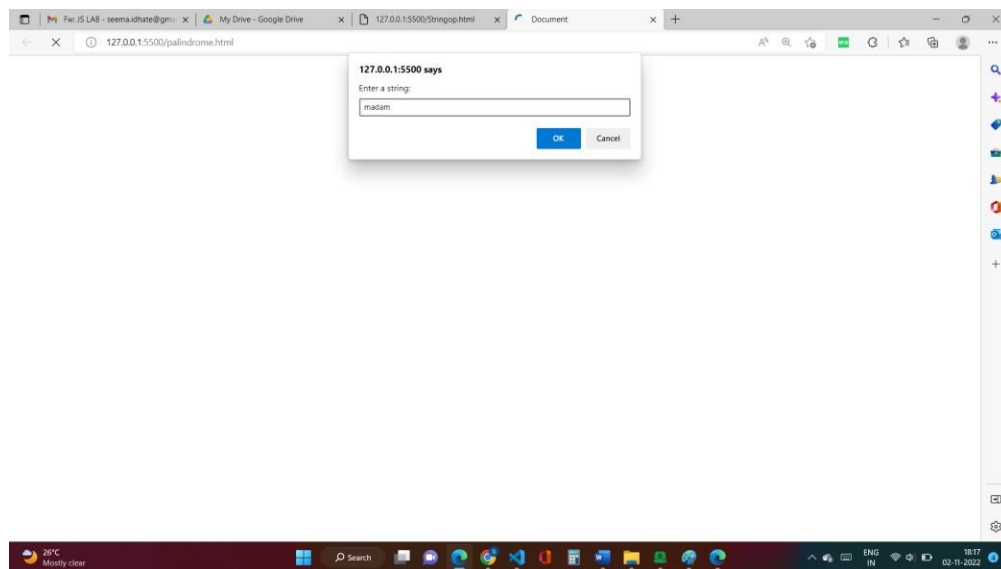
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```
const value = checkPalindrome(string);
```

Output

Enter a string: madam
It is a palindrome



Conclusion:



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Experiment No. 4

Title: Write a JavaScript program to compare two strings using various methods.

Date of Performance:

Roll No:

Date of Submission:

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Experiment No. 4

Compare two strings using various methods.

Title: Compare two strings using various methods.

Aim: Write a JavaScript program to compare two strings using various methods.

Theory:

In this example, you will learn to write a JavaScript program to compare two strings using various methods.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript String
- JavaScript String to UpperCase()
- JavaScript Regex

Java script Code:

```
// js program to perform string comparison

const string1 = 'JavaScript Program';
const string2 = 'javascript ';

// compare both strings
const result = string1.toUpperCase() === string2.toUpperCase();

if(result) {
    console.log('The strings are similar.');
```

Output:

The strings are similar.

In the above program, two strings are compared. Here,



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- The `toUpperCase()` method converts all the string characters to uppercase.
- `===` is used to check if both the strings are the same.
- The `if...else` statement is used to display the result as per the condition.

JS String Comparison Using RegEx

```
// program to perform string comparison

const string1 = 'JavaScript Program';
const string2 = 'javascript program';

// create regex
const pattern = new RegExp(string1, "gi");

// compare the strings
const result = pattern.test(string2)

if(result) {
    console.log('The strings are similar.');
```

Run Code

Output



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The strings are similar.

In the above program, the RegEx is used with the `test()` method to perform case insensitive string comparison.

In the RegEx pattern, "g" syntax denotes **global** and "gi" syntax denotes **case insensitive** comparisons.

Conclusion:

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Experiment No. 5

Title: Write a JavaScript program that will create a countdown timer.

Date of Performance:

Roll No:

Date of Submission:

University Seat No:

Signature of Staff:



Experiment No. 5

Create a Countdown Timer.

Title: Create a Countdown Timer

Aim: Write a JavaScript program that will create a countdown timer.

Theory:

In this example, you will learn to write a JavaScript program that will create a countdown timer.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript Math floor()
- JavaScript Date and Time
- Javascript setInterval()

Java script Code:

```
// program to create a countdown timer
```

```
// time to countdown from (in milliseconds)
```

```
let countdownDate = new Date().getTime() + 24 * 60 * 60 * 1000;
```

```
// countdown timer
```

```
let x = setInterval(function() {
```

```
    // get today's date and time in milliseconds
```

```
    let now = new Date().getTime();
```

```
    // find the interval between now and the countdown time
```

```
    let timeLeft = countdownDate - now;
```

```
    // time calculations for days, hours, minutes and seconds
```

```
    const days = Math.floor( timeLeft/(1000*60*60*24) );
```

```
    const hours = Math.floor( (timeLeft/(1000*60*60)) % 24 );
```



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```
const minutes = Math.floor( (timeLeft/1000/60) % 60 );
const seconds = Math.floor( (timeLeft/1000) % 60 );

// display the result in the element with id="demo"
console.log(days + "d " + hours + "h " + minutes + "m " + seconds + "s");

// clearing countdown when complete
if (timeLeft < 0) {
    clearInterval(x);
    console.log('CountDown Finished');
}
}, 2000);
```

Output

0d 23h 59m 57s

0d 23h 59m 55s

0d 23h 59m 53s

0d 23h 59m 51s

...

In the above program, the `setInterval()` method is used to create a timer.

The `setInterval()` method is executed at a given interval time
(here, **2000** milliseconds).

The `new Date()` gives the current date and time. For example,

```
let d1 = new Date();
console.log(time); // Fri Aug 28 2020 09:19:40 GMT+0545 (+0545)
```



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The `getTime()` method returns the number of milliseconds from midnight of **January 1, 1970 (EcmaScript epoch)** to the specified date (here, current date).

The following code gives the next day's time in milliseconds.

```
new Date().getTime() + 24 * 60 * 60 * 1000;
```

Now, we can calculate time left using the following formula:

```
let timeLeft = countdownDate - now;
```

The remaining number of day is calculated using:

- The time interval is divided by **1000** to determine the number of seconds,
i.e. `timeLeft / 1000`
- The time interval then is divided by **60 * 60 * 24** to determine the number of days remaining.
- The `Math.floor()` function is used to round the number to a whole number.

Similar methods are used for hours, minutes, and seconds.

Conclusion:

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Experiment No. 6

Title: Write a JavaScript program that will create an array and perform following operations

- i. To remove specific element from the array
- ii. Check if an array contains a specified value.
- iii. To empty an array

Date of Performance:

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Experiment No. 6

Create an Array.

Title: Create an Array

Aim: Write a JavaScript program that will create an array and perform following operations

- i. To remove specific element from the array
- ii. Check if an array contains a specified value.
- iii. To empty an array

Theory:

i. To remove specific element from the array

In this example, you will learn to write a JavaScript program that will remove a specific item from an array.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript Array push()
- JavaScript Array splice()
- JavaScript for loop

Java script Code:

Using For Loop

```
/ program to remove item from an array

function removeItemFromArray(array, n) {
    const newArray = [];

    for ( let i = 0; i < array.length; i++) {
        if(array[i] !== n) {
            newArray.push(array[i]);
        }
    }
    return newArray;
}
```



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```
const result = removeItemFromArray([1, 2, 3, 4, 5], 2);
```

```
console.log(result);
```

Output

```
[1,2,3,4]
```

In the above program, an item is removed from an array using a `for` loop.
Here,

- The `for` loop is used to loop through all the elements of an array.
- While iterating through the elements of the array, if the item to remove does not match with the array element, that element is pushed to `newArray`.
- The `push()` method adds the element to `newArray`.

ii. Check if an array contains a specified value.

In this example, you will learn to write a JavaScript program that will check if an array contains a specified value.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript Array includes()
- JavaScript Array indexOf()
- JavaScript Arrays

Java script Code:

Check Array Using includes()

```
// program to check if an array contains a specified value
```

```
const array = ['you', 'will', 'learn', 'javascript'];
```

```
const hasValue = array.includes('javascript');
```



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```
// check the condition
if(hasValue) {
    console.log('Array contains a value.');
```

```
} else {
    console.log('Array does not contain a value.');
```

```
}
```

Output

Array contains a value.

In the above program, the `includes()` method is used to check if an array contains a specified value.

- The `includes()` method returns `true` if the value exists in the array.
- The `if...else` statement is used to display the result as per the condition.

iii. To empty an array

In this example, you will learn to write a JavaScript program that will empty an array.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript Function and Function Expressions
- JavaScript Array length
- JavaScript Array splice()

Java script Code:

Empty Array by Substituting New Array

```
// program to empty an array

function emptyArray(arr) {
```



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```
// substituting new array
arr = [];

return arr;
}

const array = [1, 2, 3];
console.log(array);

// call the function
const result = emptyArray(array);
console.log(result);
```

Output

```
[1,2,3,4]
[]
```

In the above program, the value of `array` is substituted by a new empty array.

Conclusion:

.....

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.....



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Experiment No. 7

Title: Write a JavaScript program to illustrate different Set operations like-

- a. Union
- b. Intersection
- c. Difference
- d. Set Subset

Date of Performance:

Roll No:

Date of Submission:

University Seat No:

Signature of Staff:



Experiment No. 7

Illustrate Different Set Operations.

Title: illustrate Different Set Operations

Aim: Write a JavaScript program to illustrate different Set operations like-

- a. Union
- b. Intersection
- c. Difference
- d. Set Subset

Theory:

In this example, you will learn to write a JavaScript program that will illustrate different set operations.

To understand this example, you should have the knowledge of the following JavaScript programming topics:

- JavaScript Set and WeakSet
- JavaScript for... of Loop
- JavaScript Function and Function Expressions

a. Union

Java script Code:

Set Union Operation

```
// perform union operation
// contain elements of both sets
function union(a, b) {
let unionSet = new Set(a);
for (let i of b) {
    unionSet.add(i);
}
```



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```
return unionSet
}

// two sets of fruits

const setA = new Set(['apple', 'mango', 'orange']);

const setB = new Set(['grapes', 'apple', 'banana']);

const result = union(setA, setB);

console.log(result);
```

Output

```
Set {"apple", "mango", "orange", "grapes", "banana"}
```

The set union operation combines elements of both sets into one.

A new set `unionSet` is created using `new Set()`. The `unionSet` variable contains all the values of `setA`. Then, the `for...of` loop is used to iterate through all the elements of `setB` and add them to `unionSet` using the `add()` method.

The set does not contain duplicate values. Hence, if the set contains the same value, the latter value is discarded.

b. Intersection

Java script Code:

Set Intersection Operation

```
// perform intersection operation
// elements of set a that are also in set b
function intersection(setA, setB) {
  let intersectionSet = new Set();

  for (let i of setB) {
    if (setA.has(i)) {
```



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```
        intersectionSet.add(i);
    }
}
return intersectionSet;
}

// two sets of fruits
const setA = new Set(['apple', 'mango', 'orange']);
const setB = new Set(['grapes', 'apple', 'banana']);

const result = intersection(setA, setB);

console.log(result);
```

Output

```
Set {"apple"}
```

The set intersection operation represents elements that are present in both `setA` and `setB`.

A new set `intersectionSet` is created using `new Set()`. Then, the `for...of` loop is used to iterate through the `setB`. For every element that is present in both `setA` and `setB`, they are added to the intersection set.

c. Set Difference

Java script Code:

Set Difference Operation

```
// perform difference operation
// elements of set a that are not in set b
function difference(setA, setB) {
    let differenceSet = new Set(setA)
    for (let i of setB) {
        differenceSet.delete(i)
    }
}
```



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```
}  
  return differenceSet  
}  
  
// two sets of fruits  
const setA = new Set(['apple', 'mango', 'orange']);  
const setB = new Set(['grapes', 'apple', 'banana']);  
  
const result = difference(setA, setB);  
  
console.log(result);
```

Output

```
Set {"mango", "orange"}
```

The set difference operation represents elements that are present in one set and not in another set.

The `differenceSet` contains all the elements of `setA`. Then, the `for...of` loop is used to iterate through all the elements of `setB`. If the element that is present in `setB` is also available in `setA`, that element is deleted using `delete()` method.

d. Set Subset

Java script Code:

Set Subset Operation

```
// perform subset operation  
  
// true if all elements of set b is in set a  
  
function subset(setA, setB) {
```



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```
for (let i of setB) {  
    if (!setA.has(i)) {  
        return false  
    }  
}  
  
return true  
}  
  
// two sets of fruits  
  
const setA = new Set(['apple', 'mango', 'orange']);  
  
const setB = new Set(['apple', 'orange']);  
  
const result = subset(setA, setB);  
  
console.log(result);
```

Output

true

The set subset operation returns true if all the elements of `setB` are in `setA`.

The `for...of` loop is used to loop through the elements of `setB`. If any element that is present in `setB` is not present in `setA`, `false` is returned.

Conclusion:



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Experiment No. 8

Title: Write a JavaScript program to create a Home page of any website and change background color using

- i. On mouse over event
- ii. On focus event

Date of Performance:

Roll No:

Date of Submission:

University Seat No:

Signature of Staff:



Experiment No. 8

Create Home Page of Any Website.

Title: Create Home page of Any Website

Aim: Write a JavaScript program to create a Home page of any website and change background color using

- i. On mouse over event
- ii. On focus event

Theory:

In this practical, we will learn how to change background color in javascript. The background color of our website describes the overall theme of our website. Depending upon background color, we choose different color palettes for buttons, inputs, and other elements. We must have seen websites where they give you the option to choose between light and dark themes. As soon as you pick a theme, the background color of the website, as well as background color of other elements gets changed.

- We have use two event for changing the background color.

1. On mouse over event

2. On focus event

1. On mouse over event

The onmouseover event occurs when the mouse pointer is moved onto an element, or onto one of its children.

This event is often used together with the onmouseout event, which occurs when a user moves the mouse pointer out of an element.

Syntax

1. In HTML:

```
<element onmouseover="myScript">
```

2. In JavaScript:

```
object.onmouseover = function(){myScript};
```

2. On focus event

The onfocus event occurs when an element gets focus.

The onfocus event is most often used with <input>, <select>, and <a>.

Syntax

1. In HTML:



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`<element onfocus="myScript">`

2.In JavaScript:

`object.onfocus = function(){myScript};`

JAVASCRIPT CODE:

Code for mouseover event:

```
<!DOCTYPE html>
<html>
<body>
<p>This example demonstrates how to assign an "onmouseover" and "onmouseout"
event to a h1 element.</p>
<h1 id="demo" onmouseover="mouseOver()" onmouseout="mouseOut()">Mouse
over me</h1>
<script>
function mouseOver() {
document.getElementById("demo").style.color = "red";
}
function mouseOut() {
document.getElementById("demo").style.color = "black";
}
</script>
</body>

</html>
```

OUTPUT OF MOUSEOVER:



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```
<!DOCTYPE html>
<html>
<body>

<p>This example demonstrates how to assign an "onmouseover" and
"onmouseout" event to a h1 element.</p>

<h1 id="demo" onmouseover="mouseOver()" onmouseout="mouseOut()">Mouse
over me</h1>

<script>
function mouseOver() {
    document.getElementById("demo").style.color = "red";
}

function mouseOut() {
    document.getElementById("demo").style.color = "black";
}
</script>

</body>
</html>
```

This example demonstrates how to assign an "onmouseover" and "onmouseout" event to a h1 element.

Mouse over me

```
<!DOCTYPE html>
<html>
<body>

<p>This example demonstrates how to assign an "onmouseover" and
"onmouseout" event to a h1 element.</p>

<h1 id="demo" onmouseover="mouseOver()" onmouseout="mouseOut()">Mouse
over me</h1>

<script>
function mouseOver() {
    document.getElementById("demo").style.color = "red";
}

function mouseOut() {
    document.getElementById("demo").style.color = "black";
}
</script>

</body>
</html>
```

This example demonstrates how to assign an "onmouseover" and "onmouseout" event to a h1 element.

Mouse over me

Code for On focus event:

```
<!DOCTYPE html>
```

```
<html>
```

```
<body>
```

```
Enter your name: <input type="text" onfocus="myFunction(this)">
```

JAVA SCRIPT (2019 course) Sem.-I



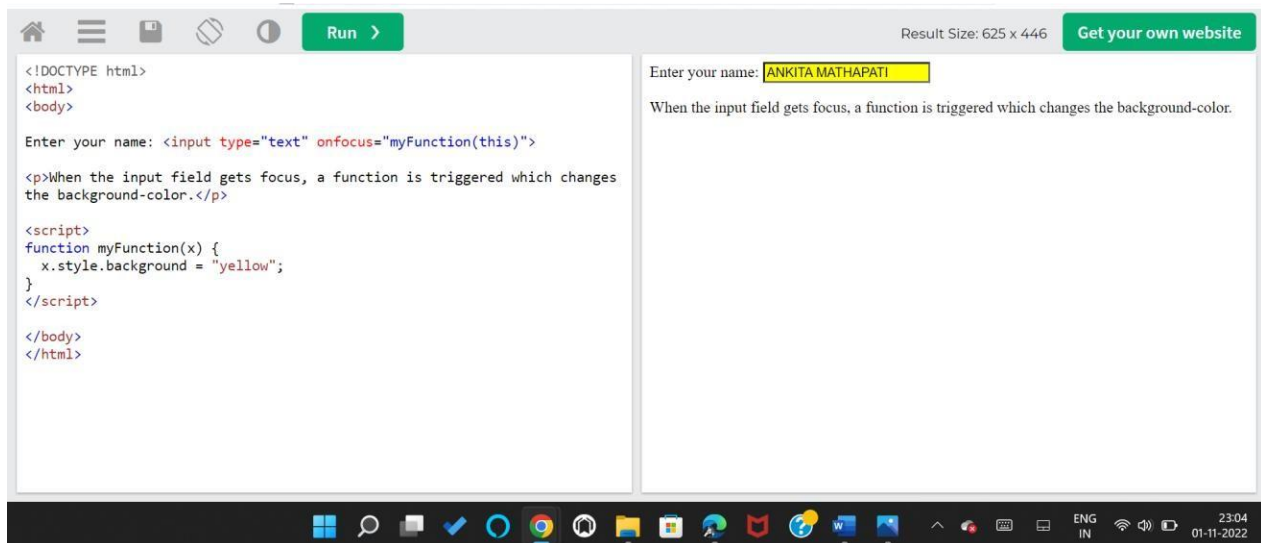
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<p>When the input field gets focus, a function is triggered which changes the background-color.</p>

```
<script>
function myFunction(x) {
x.style.background = "yellow";
}
</script>
</body>
</html>
```

OUTPUT OF ON FOCUS EVENT:



Conclusion:



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Experiment No. 9

Title: Design and implement a simple calculator using Java script for operations like addition multiplication, subtraction, division, square of a number etc:

- Design a calculator like text field for input and output, buttons for numbers and operations etc.
- Validate input values
- Prompt / Alerts for invalid values etc.

Date of Performance:

Roll No:

Date of Submission:

University Seat No:

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Experiment No. 9

Implement a Simple Calculator.

Title: Implement a Simple Calculator .

Aim:

Design and implement a simple calculator using Java script for operations like addition multiplication, subtraction, division, square of a number etc:

- Design a calculator like text field for input and output, buttons for numbers and operations etc.
- Validate input values
- Prompt / Alerts for invalid values etc.

Theory:

Event handling in JavaScript :

1. The **addEventListener()** method is used to attach an event handler to a particular element. It does not override the existing event handlers.
2. Events are said to be an essential part of the JavaScript. A web page responds according to the event that occurred. Events can be user-generated or generated by API's.
3. An event listener is a JavaScript's procedure that waits for the occurrence of an event.
4. The **addEventListener()** method is an inbuilt function of JavaScript
5. We can add multiple event handlers to a particular element without overwriting the existing event handlers.

Syntax:

Element.addEventListener(event, function, useCapture);

- The **addEventListener()** method attaches an event handler to the specified element.
- The **addEventListener()** method attaches an event handler to an element without overwriting existing event handlers.
- You can add many event handlers to one element.
- You can add many event handlers of the same type to one element, i.e two "click" events.
- You can add event listeners to any DOM object not only HTML elements. i.e the window object.
- The **addEventListener()** method makes it easier to control how the event reacts to bubbling.



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- When using the `addEventListener()` method, the JavaScript is separated from the HTML markup, for better readability and allows you to add event listeners even when you do not control the HTML markup.
- You can easily remove an event listener by using the `removeEventListener()` method.

JavaScript if else statement:

Since we are using if else statement in our code, we will be discussing if else only. It evaluates the content whether condition is true or false. The syntax of JavaScript if-else statement is given below.

Syntax :

```
if(expression){  
  //content to be evaluated if condition is true  
}  
else{  
  //content to be evaluated if condition is false
```

JAVASCRIPT CODE

HTML PART

```
<!DOCTYPE html>  
<html lang="en">  
<head>  
<meta charset="UTF-8"> A  
<meta http-equiv="X-UA-Compatible" content="IE=edge">  
<meta name="viewport" content="width=device-width, initial-scale=1.0">  
<title>Calculator</title>  
<link rel="stylesheet" href="style.css">  
<link rel="preconnect" href="https://fonts.googleapis.com">  
<link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>  
<link  
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&display=swa  
p" rel="stylesheet">  
</head>  
<body>  
<div class="container">  
<h1>Calculator</h1>  
<div class="container2">  
<input type="text" placeholder="0" name="screen" id="screen">  
<table>  
<tr>
```



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```
<td><button id="clearall">C</button></td>
<td><button>(</button></td>
<td><button>)</button></td>
<td><button>Del</button></td>
</tr>
<tr>
<td><button>9</button></td>
<td><button>8</button></td>
<td><button>7</button></td>
<td><button>*</button></td>
</tr>
<tr>
<td><button>6</button></td>
<td><button>5</button></td>
<td><button>4</button></td>
<td><button>-</button></td>
</tr>
<tr>
<td><button>3</button></td>
<td><button>2</button></td>
<td><button>1</button></td>
<td><button>+</button></td>
</tr>
<tr>
<td><button>0</button></td>
<td><button>.</button></td>
<td><button>/</button></td>
<td><button id="equal">=</button></td>
</tr>
</table>
</div>
</div>
</body>
<script src="script.js"></script>
</html>
```

JAVASCRIPT PART

```
let screen = document.getElementById('screen');
buttons = document.querySelectorAll('button');
let screenValue = "";
for (item of buttons) {
  item.addEventListener('click', (e) => {
    buttonText = e.target.innerText;
    console.log('Button text is ', buttonText);
    if (buttonText == 'C') {
```

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```
screenValue = "";
screen.value = screenValue;
}
else if (buttonText == '=') {
screen.value = eval(screenValue);
}
else if(buttonText=='Del'){
screen.value = screen.value.slice(0,-1);
screenValue = "";
}
else {
screenValue += buttonText;
screen.value = screenValue;
}
})
}
```

CSS PART

```
body{
/* background-image: url(img/434906-abstract-pink-gradient.jpg);
background-repeat: no-repeat; */
font-family: 'Playfair Display', serif;
}
.container{
text-align: center;
padding-top: 5%;
}
.container2{
display: inline-block;
border: 2px ;
border-radius: 20px;
padding: 25px;
background-color: rgb(135, 175, 216);
}
h1{
color: #ffffff;
}
table{
margin: auto;
}
input{
font-size: 30px;
background-color: #868585bb;
color: #221f1f;
```

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```
height: 40px ;
padding-left: 5px;
padding-top: 10px;
padding-bottom: 10px;
border-radius: 10px;
margin-bottom: 5px;
}
button {
border-radius: 20px;
font-size: 26px;
color: #ffffff;
width: 92px;
height: 70px;
background: #3439d9;
background-image: -webkit-linear-gradient(top, #3439d9, #0570f2);
background-image: -moz-linear-gradient(top, #3439d9, #0570f2);
background-image: -ms-linear-gradient(top, #3439d9, #0570f2);
background-image: -o-linear-gradient(top, #3439d9, #0570f2);
background-image: linear-gradient(to bottom, #3439d9, #0570f2);
text-shadow: 1px 1px 3px #666666;
padding: 10px 20px 10px 20px;
text-decoration: none;
}
button:hover {
background: #3cb0fd;
background-image: -webkit-linear-gradient(top, #3cb0fd, #3498db);
background-image: -moz-linear-gradient(top, #3cb0fd, #3498db);
background-image: -ms-linear-gradient(top, #3cb0fd, #3498db);
background-image: -o-linear-gradient(top, #3cb0fd, #3498db);
background-image: linear-gradient(to bottom, #3cb0fd, #3498db);
text-decoration: none;
}
#clearall{
border-radius: 20px;
font-size: 26px;
color: #ffffff;
width: 92px;
height: 70px;
background: #ff0000;
background-image: -webkit-linear-gradient(top, #ff0202, #8d1414);
background-image: -moz-linear-gradient(top, #ff0202, #8d1414);
background-image: -ms-linear-gradient(top, #ff0202, #8d1414);
background-image: -o-linear-gradient(top, #ff0202, #8d1414);
background-image: linear-gradient(to bottom, #ff0202, #8d1414);
```

JAVA SCRIPT (2019 course) Sem.-I

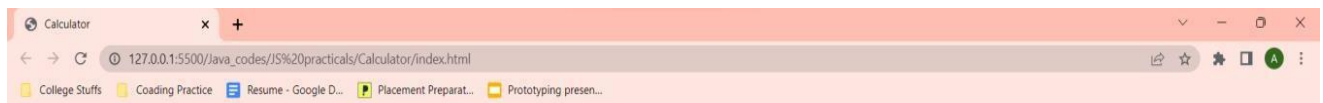


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```
text-shadow: 1px 1px 3px #666666;  
padding: 10px 20px 10px 20px;  
text-decoration: none;  
}  
#clearall:hover {  
background: #3cb0fd;  
background-image: -webkit-linear-gradient(top, #ff3d02, #ad2a09);  
background-image: -moz-linear-gradient(top, #ff3d02, #ad2a09);  
background-image: -ms-linear-gradient(top, #ff3d02, #ad2a09);  
background-image: -o-linear-gradient(top, #ff3d02, #ad2a09);  
background-image: linear-gradient(to bottom, #ff3d02, #ad2a09);  
text-decoration: none;  
}
```

OUTPUT: -





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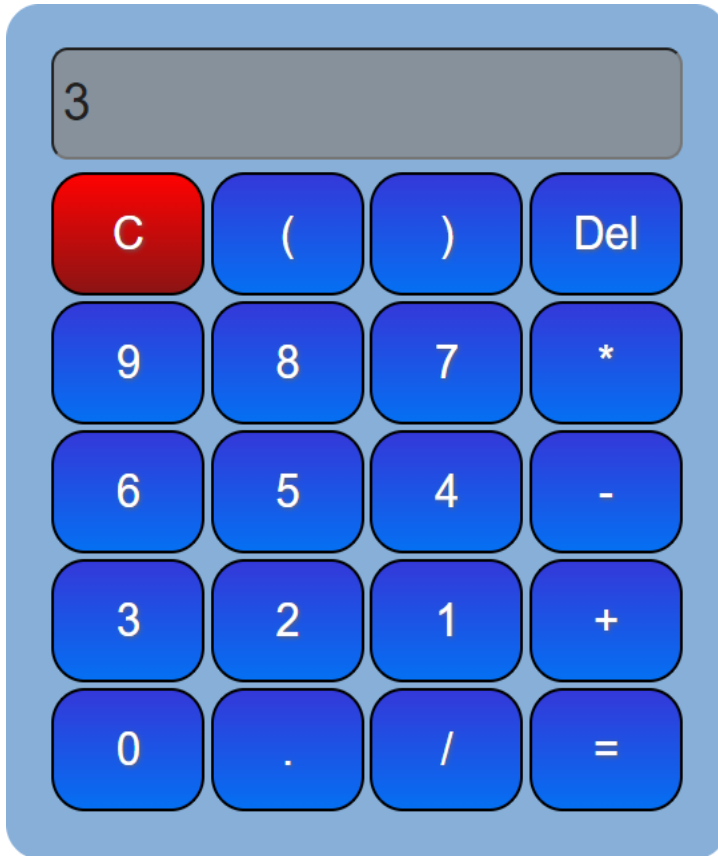
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Conclusion:

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