JavaScript Part-2

Unit-4

Web Designing KIT401

Topic Covered

- JS Events , JS Arrays, Working with Arrays, JS Objects ,JS Functions , Using Java Script in Real time ,Validation of Forms, Related Examples

JavaScript Events

The change in the state of an object is known as an **Event**. In html, there are various events which represents that some activity is performed by the user or by the browser. When javascript code is included in HTML, js react over these events and allow the execution. This process of reacting over the events is called **Event Handling**. Thus, js handles the HTML events via **Event Handlers**.

When the page loads, it is called an event. When the user clicks a button, that click too is an event. Other examples include events like pressing any key, closing a window, resizing a window, etc.

Mouse events:

Event Performed	Event Handler	Description
click	onclick	When mouse click on an element
mouseover	onmouseover	When the cursor of the mouse comes over the element
mouseout	onmouseout	When the cursor of the mouse leaves an element
mousedown	onmousedown	When the mouse button is pressed over the element
mouseup	onmouseup	When the mouse button is released over the element
mousemove	onmousemove	When the mouse movement takes place.

Keyboard events:

Event Performed	Event Handler	Description
Keydown & Keyup	onkeydown & onkeyup	When the user press and then release the key

Form events:

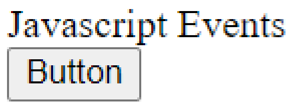
Event Performed	Event Handler	Description
focus	onfocus	When the user focuses on an element
submit	onsubmit	When the user submits the form
blur	onblur	When the focus is away from a form element
change	onchange	When the user modifies or changes the value of a form element

Window/Document events

Event Performed	Event Handler	Description
load	onload	When the browser finishes the loading of the page
unload	onunload	When the visitor leaves the current webpage, the browser unloads it
resize	onresize	When the visitor resizes the window of the browser

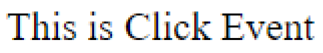
Click Event

```
<html>
<head> Javascript Events </head>
<body>
<script language="Javascript" type="text/Javascript">
function clickevent()
            {
                        document.write("This is Click Event");
            }
</script>
<form>
<input type="button" onclick="clickevent()" value="Button"/>
</form>
</body>
</html>
```



Javascript Events

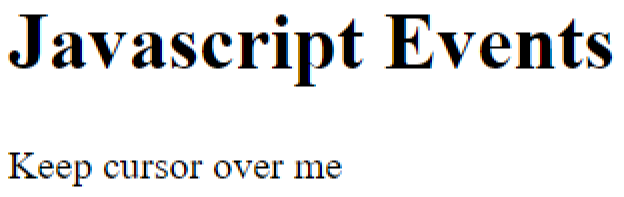
On Button click Get Output



This is Click Event

MouseOver Event

```
<html>
<head>
<h1> Javascript Events </h1>
</head>
<body>
<script language="Javascript" type="text/Javascript">
   function mouseoverevent()
   {
      alert("This is Mouse Over Event ");
   }
</script>
<p onmouseover="mouseoverevent()"> Keep cursor over me</p>
</body>
</html>
```



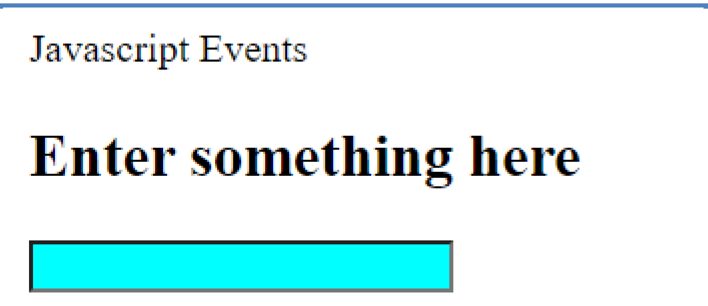
Javascript Events

Keep cursor over me

Focus Event

```
<html>
<head> Javascript Events</head>
<body>
<h2> Enter something here</h2>
<input type="text" id="input1" onfocus="focusevent()"/>
<script>

    function focusevent()
    {
        document.getElementById("input1").style.background=" aqua";
    }
</script>
</body>
</html>
```



Javascript Events

Enter something here

JavaScript Array

- JavaScript array is a single variable that is used to store different elements. It is often used when we want to store a list of elements and access them by a single variable.
- **Declaration of an Array:** There are basically two ways to declare an array.
- **Syntax:**
- let arrayName = [value1, value2, ...]; // Method 1
  let arrayName = new Array(); // Method 2

Accessing Array Elements

You access an array element by referring to the **index number**:

```
const cars = ["Saab", "Volvo", "BMW"];
let car = cars[0];
```

Note: Array indexes start with 0.

[0] is the first element. [1] is the second element.

Changing an Array Element

This statement changes the value of the first element in cars:

```
cars[0] = "Opel";
```

Example

```
const cars = ["Saab", "Volvo", "BMW"];
cars[0] = "Opel";
```

```
<html>
<body>
<script>
var emp=new
Array("Jai","Vijay","Smith");
for (i=0;i<emp.length;i++){
document.write(emp[i] + "<br>");
}
</script>
</body>
</html>
```

OUTPUT

```
Jai
Vijay
Smith
```

JavaScript Array Methods

Methods	Description
concat()	It returns a new array object that contains two or more merged arrays.
copywithin()	It copies the part of the given array with its own elements and returns the modified array.
entries()	It creates an iterator object and a loop that iterates over each key/value pair.
every()	It determines whether all the elements of an array are satisfying the provided function conditions.
flat()	It creates a new array carrying sub-array elements concatenated recursively till the specified depth.
flatMap()	It maps all array elements via mapping function, then flattens the result into a new array.
fill()	It fills elements into an array with static values.
from()	It creates a new array carrying the exact copy of another array element.
filter()	It returns the new array containing the elements that pass the provided function conditions.
find()	It returns the value of the first element in the given array that satisfies the specified condition.
findIndex()	It returns the index value of the first element in the given array that satisfies the specified condition.
forEach()	It invokes the provided function once for each element of an array.
includes()	It checks whether the given array contains the specified element.
indexOf()	It searches the specified element in the given array and returns the index of the first match.
isArray()	It tests if the passed value ia an array.
join()	It joins the elements of an array as a string.
keys()	It creates an iterator object that contains only the keys of the array, then loops through these keys.
lastIndexOf()	It searches the specified element in the given array and returns the index of the last match.
map()	It calls the specified function for every array element and returns the new array
of()	It creates a new array from a variable number of arguments, holding any type of argument.
pop()	It removes and returns the last element of an array.
push()	It adds one or more elements to the end of an array.
reverse()	It reverses the elements of given array.
reduce(function, initial)	It executes a provided function for each value from left to right and reduces the array to a single value.

reduceRight()	It executes a provided function for each value from right to left and reduces the array to a single value.
some()	It determines if any element of the array passes the test of the implemented function.
shift()	It removes and returns the first element of an array.
slice()	It returns a new array containing the copy of the part of the given array.
sort()	It returns the element of the given array in a sorted order.
splice()	It add/remove elements to/from the given array.
toLocaleString()	It returns a string containing all the elements of a specified array.
toString()	It converts the elements of a specified array into string form, without affecting the original array.
unshift()	It adds one or more elements in the beginning of the given array.
values()	It creates a new iterator object carrying values for each index in the array.

JavaScript Objects

- A JavaScript object is an entity having state and behavior (properties and method). For example: car, pen, bike, chair, glass, keyboard, monitor etc.
- JavaScript is an object-based language. Everything is an object in JavaScript.
- JavaScript is template based not class based. Here, we don't create class to get the object. But, we direct create objects.

Creating Objects in JavaScript

1.By object literal
2.By creating instance of Object directly (using new keyword)
3.By using an object constructor (using new keyword)

1. JavaScript Object by object literal

The syntax of creating object using object literal is given below:
object={property1:value1,property2:value2.....propertyN:valueN}
As you can see, property and value is separated by : (colon).

Example

```
<html>
<body>
<script>
emp={id:102,name:"Shyam Kumar",salary:40000}
document.write(emp.id+" "+emp.name+" "+emp.salary);
</script>
</body>
</html>
```

OUTPUT

```
102 Shyam Kumar 40000
```

2. By creating instance of Object

The syntax of creating object directly is given below:
var objectname=new Object();
Here, **new keyword** is used to create object.

EXAMPLE

```
<html>
<body>
<script>
var emp=new Object();
emp.id=101;
emp.name="Ravi Malik";
emp.salary=50000;
document.write(emp.id+" "+emp.name+" "+emp.salary);
</script>
</body>
</html>
```

OUTPUT

```
101 Ravi Malik 50000
```

3. By using an Object constructor

Here, you need to create function with arguments. Each argument value can be assigned in the current object by using this keyword.

The **this keyword** refers to the current object.

EXAMPLE

```
<html>
<body>
<script>
function emp(id,name,salary){
this.id=id;
this.name=name;
this.salary=salary;  }
e=new emp(103,"Vimal Jaiswal",30000);
document.write(e.id+" "+e.name+" "+e.salary);
</script>
</body>
</html>
```

OUTPUT

```
103 Vimal Jaiswal 30000
```

JavaScript Object Methods

The various methods of Object are as follows:

S.No	Methods	Description
1	Object.assign()	This method is used to copy enumerable and own properties from a source object to a target object
2	Object.create()	This method is used to create a new object with the specified prototype object and properties.
3	Object.defineProperty()	This method is used to describe some behavioral attributes of the property.
4	Object.defineProperties()	This method is used to create or configure multiple object properties.
5	Object.entries()	This method returns an array with arrays of the key, value pairs.
6	Object.freeze()	This method prevents existing properties from being removed.
7	Object.getOwnPropertyDescriptor()	This method returns a property descriptor for the specified property of the specified object.
8	Object.getOwnPropertyDescriptors()	This method returns all own property descriptors of a given object.
9	Object.getOwnPropertyNames()	This method returns an array of all properties (enumerable or not) found.
10	Object.getOwnPropertySymbols()	This method returns an array of all own symbol key properties.
11	Object.getPrototypeOf()	This method returns the prototype of the specified object.
12	Object.is()	This method determines whether two values are the same value.
13	Object.isExtensible()	This method determines if an object is extensible
14	Object.isFrozen()	This method determines if an object was frozen.
15	Object.isSealed()	This method determines if an object is sealed.
16	Object.keys()	This method returns an array of a given object's own property names.
17	Object.preventExtensions()	This method is used to prevent any extensions of an object.
18	Object.seal()	This method prevents new properties from being added and marks all existing properties as non-configurable.
19	Object.setPrototypeOf()	This method sets the prototype of a specified object to another object.
20	Object.values()	This method returns an array of values.

JavaScript Functions

JavaScript functions are used to perform operations. We can call JavaScript function many times to reuse the code.

Advantage of JavaScript function

There are mainly two advantages of JavaScript functions.

Code reusability: We can call a function several times so it save coding.

Less coding: It makes our program compact. We don’t need to write many lines of code each time to perform a common task.

JavaScript Function Syntax

The syntax of declaring function is given below.

```
function functionName([arg1, arg2, ...argN]){
 //code to be executed
}
```

JavaScript Functions can have 0 or more arguments.

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

<h1>JavaScript Functions</h1>

<p>Call a function which performs
multiplication and returns the result:</p>

<script>

function myFunction(a, b)
{
  return a * b;
}
let x = myFunction(14, 13);
document.write(x)

</script>

</body>
</html>
```

JavaScript Functions
Call a function which performs multiplication and returns the result:
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JavaScript Date Object

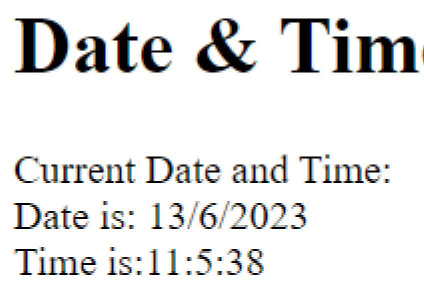
Methods	Description
getDate()	It returns the integer value between 1 and 31 that represents the day for the specified date on the basis of local time.
getDay()	It returns the integer value between 0 and 6 that represents the day of the week on the basis of local time.
getFullYears()	It returns the integer value that represents the year on the basis of local time.
getHours()	It returns the integer value between 0 and 23 that represents the hours on the basis of local time.
getMilliseconds()	It returns the integer value between 0 and 999 that represents the milliseconds on the basis of local time.
getMinutes()	It returns the integer value between 0 and 59 that represents the minutes on the basis of local time.
getMonth()	It returns the integer value between 0 and 11 that represents the month on the basis of local time.
getSeconds()	It returns the integer value between 0 and 60 that represents the seconds on the basis of local time.

```
<html>
<body>

<h1>Date & Time</h1>
Current Date and Time:
<script>
var today=new Date();
var day=today.getDate();
var month=today.getMonth()+1;
var year=today.getFullYear();
var h=today.getHours();
var m=today.getMinutes();
var s=today.getSeconds();
document.write("<br>Date is:
"+day+"/"+month+"/"+year);

document.write("<br>Time is:"
+h+":"+m+":"+s);
</script>

</body>
</html>
```



```
Date & Time

Current Date and Time:
Date is: 13/6/2023
Time is:11:5:38
```

JavaScript Form Validation

- It is important to validate the form submitted by the user because it can have inappropriate values. So, validation is must to authenticate user.
- JavaScript provides facility to validate the form on the client-side so data processing will be faster than server-side validation. Most of the web developers prefer JavaScript form validation.
- Through JavaScript, we can validate name, password, email, date, mobile numbers and more fields.

In this example, we are going to validate the name and password. The name can’t be empty and password can’t be less than 6 characters long.

Here, we are validating the form on form submit. The user will not be forwarded to the next page until given values are correct.

```
<html>
<body>
<script>
function validateform(){
var name=document.myform.name.value;
var password=document.myform.password.value;

if (name==null || name==""){
  alert("Name can't be blank");
  return false;
}else if(password.length<6){
  alert("Password must be at least 6 characters long.");
  return false;
  }
}
</script>
<body>
<form name="myform"  onsubmit="return validateform()" >
Name: <input type="text" name="name"><br/>
Password: <input type="password" name="password"><br/>
<input type="submit" value="register">
</form>
</body>
</html>
```

JavaScript Retype Password Validation

```html
<!DOCTYPE html>
<html>
<head>
<script type="text/javascript">
function matchpass(){
var firstpassword=document.f1.password.value;
var secondpassword=document.f1.password2.value;

if(firstpassword==secondpassword){
return true;
}
else{
alert("password must be same!");
return false;
}
}
</script>
</head>
<body>

<form name="f1" onsubmit="return matchpass()">
Password:<input type="password" name="password" /><br/>
Re-enter Password:<input type="password" name="password2"/><br/>
<input type="submit">
</form>

</body>
</html>
```

Thanking You