Session: 12

Introduction to JavaScript

Objectives

- Explain scripting
- Explain the JavaScript language
- Explain the client-side and server-side JavaScript
- List the variables and data types in JavaScript
- Describe the JavaScript methods to display information
- Explain escape sequences and built in functions in JavaScript
- Explain events and event handling
- Explain jQuery
- Describe how to use the jQuery Mobile

Scripting 1-2

- Scripting refers to a series of commands that are interpreted and executed sequentially and immediately on occurrence of an event.
- This event is an action generated by a user while interacting with a Web page.
- Examples of events include button clicks, selecting a product from a menu, and so on.
- A scripting language refers to a set of instructions that provides some functionality when the user interacts with a Web page.
- Scripting languages are often embedded in the HTML pages to change the behavior of the Web pages according to the user’s requirements.

Scripting 2-2

There are two types of scripting languages as follows:

- ***Client-side Scripting:***
  Refers to a script being executed on the client’s machine by the browser.

- ***Server-side Scripting:***
  Refers to a script being executed on a Web server to generate dynamic HTML pages.

JavaScript

- is a scripting language that allows building dynamic web pages by ensuring maximum user interactivity.
- is an object-based language, which means that it provides objects for specifying functionalities.
- In real life, an object is a visible entity such as a car or a table having some characteristics and capable of performing certain actions.
- Similarly, in a scripting language, an object has a unique identity, state, and behavior.
  - The identity of the object distinguishes it from the other objects of the same type.
  - The state of the object refers to its characteristics, whereas the behavior of the object consists of its possible actions.
  - The object stores its identity and state in fields (also called variables) and exposes its behavior through functions (actions).

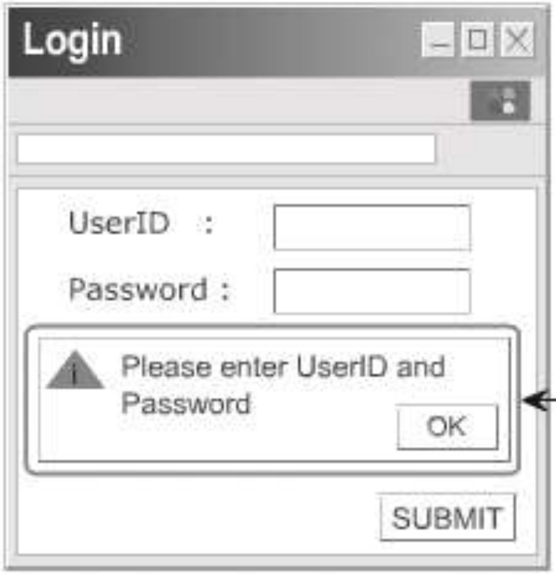
Versions of JavaScript

- The first version 1.0 was developed by Brendan Eich at Netscape in 1995.

Version	Description
1.1	Is supported from 3.0 version of the Netscape Navigator and IE.
1.2	Is supported by the IE from version 4.0.
1.3	Is supported by the IE from version 5.0, Netscape from version 4.0, and Opera from version 5.0.
1.4	Is supported by servers of Netscape and Opera 6.
1.5	Is supported by the IE from version 6.0, Netscape from version 6.0, and Mozilla Firefox from version 1.0.
1.6	Is supported in the latest versions of the IE and Netscape browsers. It is also supported by Firefox from version 1.5.
1.7	Is supported in the latest versions of the IE and Netscape browsers. It is also supported by Firefox from version 2.0.

Client-side JavaScript

- A Client-side JavaScript (CSJS) is executed by the browser on the user's workstation.
- A client-side script might contain instructions for the browser to handle user interactivity.



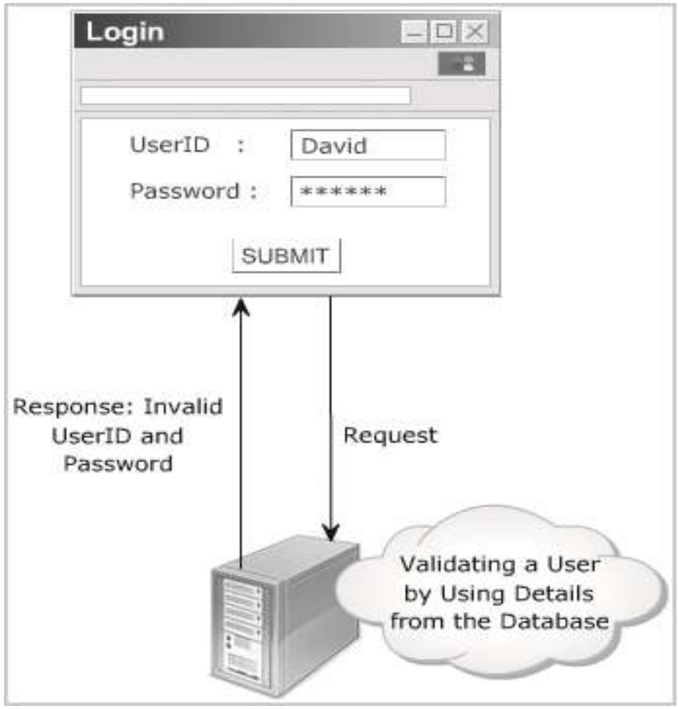
Please enter UserID and Password

Output of Client-side JavaScript

- A JavaScript is either embedded in an HTML page or is separately defined in a file, which is saved with .js extension.

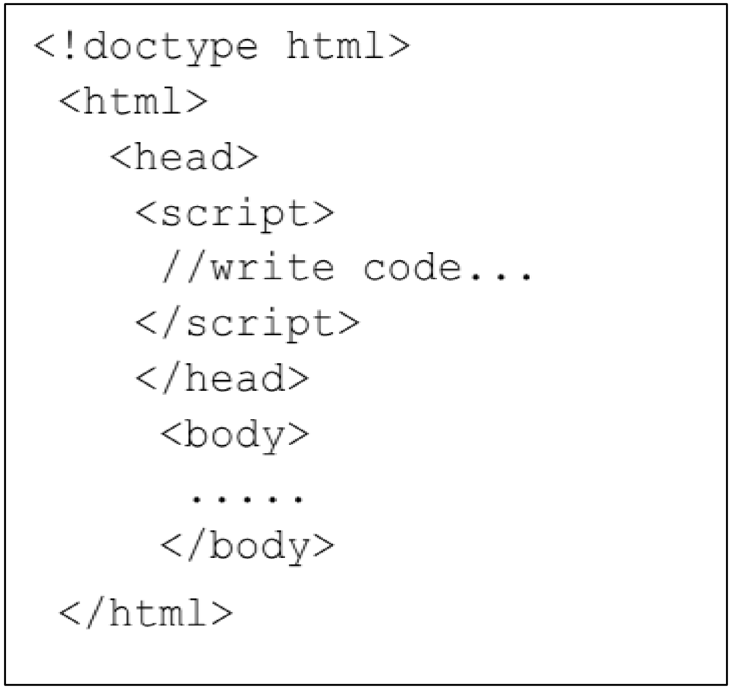
Server-side JavaScript

- is executed by the Web server when an HTML page is requested by a user.
- can interact with the database, fetch the required information and display it to the user.
- fulfills the goal of providing dynamic content in Web pages.


Login
UserID : David
Password : ******
SUBMIT
Response: Invalid UserID and Password
Request
Validating a User by Using Details from the Database

<Script> Tag

- defines a script for an HTML page.
- The browser that supports scripts interprets and executes the script specified under the <script> tag when the page loads in the browser.
- Multiple <script> tags can be defined either in the <head> or in the <body> elements.

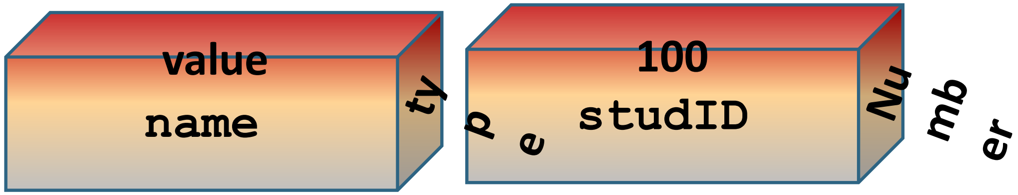


```
<!doctype html>
 <html>
   <head>
    <script>
     //write code...
    </script>
    </head>
     <body>
      .....
     </body>
 </html>
```

- There are two main purposes of the <script> tag:
  - Identifies a given segment of script in the HTML page.
  - Loads an external script file.

Declaring Variables

- Declaring a variable refers to creating a variable by specifying the variable name.



- Syntax:

```
var <variableName>;
var <variableName1> = <value1>, <variableName2> = <value2>;
```

- Code Snippet:

```
var studName = "David", studAge = 15;
```

Data Types in JavaScript

➢ PRIMITIVE DATA TYPES

- contain a single literal value such as a number or a string.
- A literal is a static value that you can assign to variables.
- Example: boolean, null, number, string

➢ COMPOSITE DATA TYPES

- store a collection of multiple related values
- In JavaScript, all composite data types are treated as objects.
- A composite data type can be either predefined or user-defined
- Example: Objects, Functions and Arrays

Method write(), writeln() in Javascript

write(): Displays any type of data.

writeln(): Displays any type of data and appends a new line character.

```
<!DOCTYPE HTML>
 <html>
 <head>
    <title> JavaScript language </title>
    <script>
         document.write(“<p> JavaScript:”);
         document.writeln(“is a scripting”);
         document.write(“and a case-sensitive language.”);
    </script>
 </head>
 <body>
    <p> JavaScript: is a scripting & case-sensitive language.</p>
 </body>
</html>
```

Using Comments

➢ SINGLE LINE COMMENTS

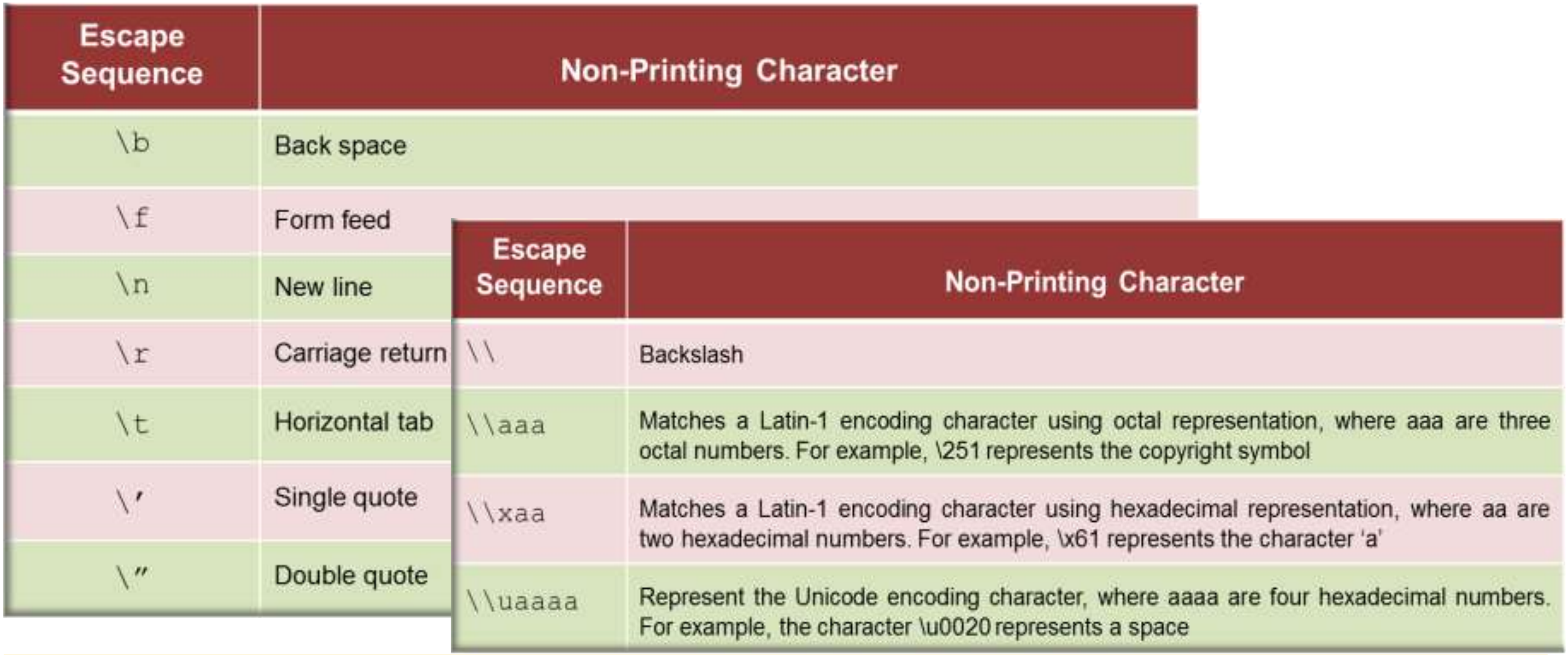
- begin with two forward slashes (//).

➢ MULTI-LINE COMMENTS

- begin with a forward slash followed by an asterisk (/*) and end with an asterisk followed by a forward slash (*/).
- Example:

```
/* This line of code
  declares a variable */
```

Escape Sequence Characters



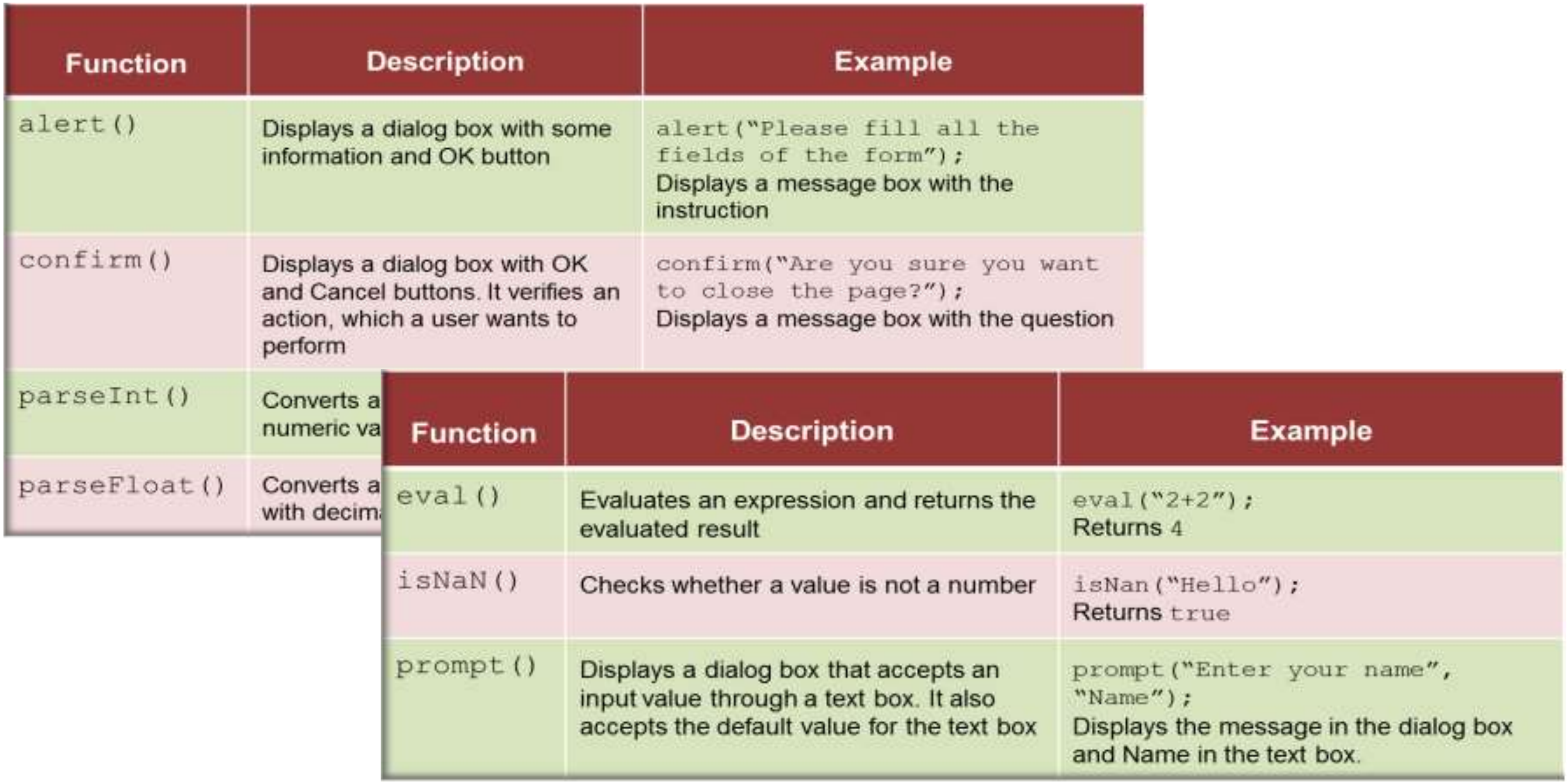
Escape Sequence	Non-Printing Character
\b	Back space
\f	Form feed
\n	New line
\r	Carriage return
\t	Horizontal tab
\’	Single quote
\”	Double quote

Escape Sequence	Non-Printing Character
\\	Backslash
\\aaa	Matches a Latin-1 encoding character using octal representation, where aaa are three octal numbers. For example, \251 represents the copyright symbol
\\xaa	Matches a Latin-1 encoding character using hexadecimal representation, where aa are two hexadecimal numbers. For example, \x61 represents the character ‘a’
\\uaaaa	Represent the Unicode encoding character, where aaaa are four hexadecimal numbers. For example, the character \u0020 represents a space

```
<script>
  document.write(“You need to have a \u0022credit card\u0022,
  if you want to shop on the \’Internet\’.”);
</script>
```

Built-in Function

- is a piece of code that performs some operations to fulfill a specific task.
- takes one or more input values, processes them, and returns an output value.



Function	Description	Example
`alert()`	Displays a dialog box with some information and OK button	`alert(“Please fill all the fields of the form”);` Displays a message box with the instruction
`confirm()`	Displays a dialog box with OK and Cancel buttons. It verifies an action, which a user wants to perform	`confirm(“Are you sure you want to close the page?”);` Displays a message box with the question
`parseInt()`	Converts a numeric va	
`parseFloat()`	Converts a with decim	

Function	Description	Example
`eval()`	Evaluates an expression and returns the evaluated result	`eval(“2+2”);` Returns 4
`isNaN()`	Checks whether a value is not a number	`isNan(“Hello”);` Returns `true`
`prompt()`	Displays a dialog box that accepts an input value through a text box. It also accepts the default value for the text box	`prompt(“Enter your name”, “Name”);` Displays the message in the dialog box and Name in the text box.

Event Handling

Event handling is a process of specifying actions to be performed when an event occurs. This is done by using an event handler.

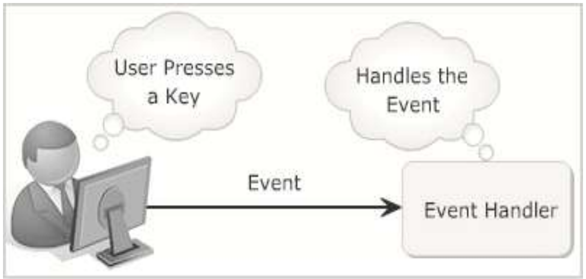
An event handler is a scripting code or a function that defines the actions to be performed when the event is triggered.

When an event occurs, an event handler function that is associated with the specific event is invoked.

The information about this generated event is updated on the `event` object.

The `event` object is a built-in object, which can be accessed through the window object.

It specifies the event state, including information such as the location of mouse cursor, element on which an event occurred, and state of the keys in a keyboard.



Keyboard Events

- occur when a key or a combination of keys are pressed or released from a keyboard.
- occur for all keys of a keyboard.
- The different keyboard events are as follows:
  - **Onkeydown** : occurs when a key is pressed down.
  - **Onkeyup** : occurs when the key is released.
  - **Onkeypress** : occurs when a key is pressed and released

Mouse Events

- occur when the user clicks the mouse button.
- Following table lists the mouse events.

Event	Description
onmousedown	Occurs when the mouse button is pressed
onmouseup	Occurs when the mouse button is released
onclick	Occurs when the mouse button is pressed and released
ondblclick	Occurs when the mouse button is double-clicked
onmousemove	Occurs when the mouse pointer is moved from one location to other
onmouseover	Occurs when the mouse pointer is moved over the element
onmouseout	Occurs when the mouse pointer is moved out of the element

Focus and Selection Events

- The focus events determines the activation of various elements. User can set or reset focus for different elements.
- The selection events occur when an element or a part of an element within a Web page is selected.

Data Type	Description
onfocus	Occurs when an element receives focus
onblur	Occurs when an element loses focus
onselectstart	Occurs when the selection of an element starts
onselect	Occurs when the present selection changes
ondragstart	Occurs when the selected element is moved

jQuery 1-2

- jQuery is a short and fast JavaScript library developed by John Resig in 2006 with a wonderful slogan: ***Write less and do more***.
- simplifies client-side scripting, animation, event handling, traversing, and developing AJAX based web applications.
- helps in rapid web app development by writing lesser code.
- Key features of jQuery:
  - **Event Handling :** jQuery has a smart way to capture a wide range of events without making the HTML code complex with event handlers.
  - **Animations :** jQuery has many built-in animation effects
  - **DOM Manipulation :** jQuery easily selects, traverses, and modifies DOM by using the cross-browser open source selector engine named Sizzle.

jQuery 2-2

- **Cross Browser Support :** jQuery has a support for cross-browser and works well with the following browsers:
    - Internet Explorer 6 and above
    - Firefox 2.0 and above
    - Safari 3.0 and above
    - Chrome
    - Opera 9.0 and above
- **Lightweight :** jQuery has a lightweight library of 19 KB size.
- **AJAX Support:** jQuery helps you to develop feature-rich and responsive Web sites by using AJAX technologies.
- **Latest Technology** jQuery supports basic XPath syntax and CSS3 selectors.

Using jQuery Library

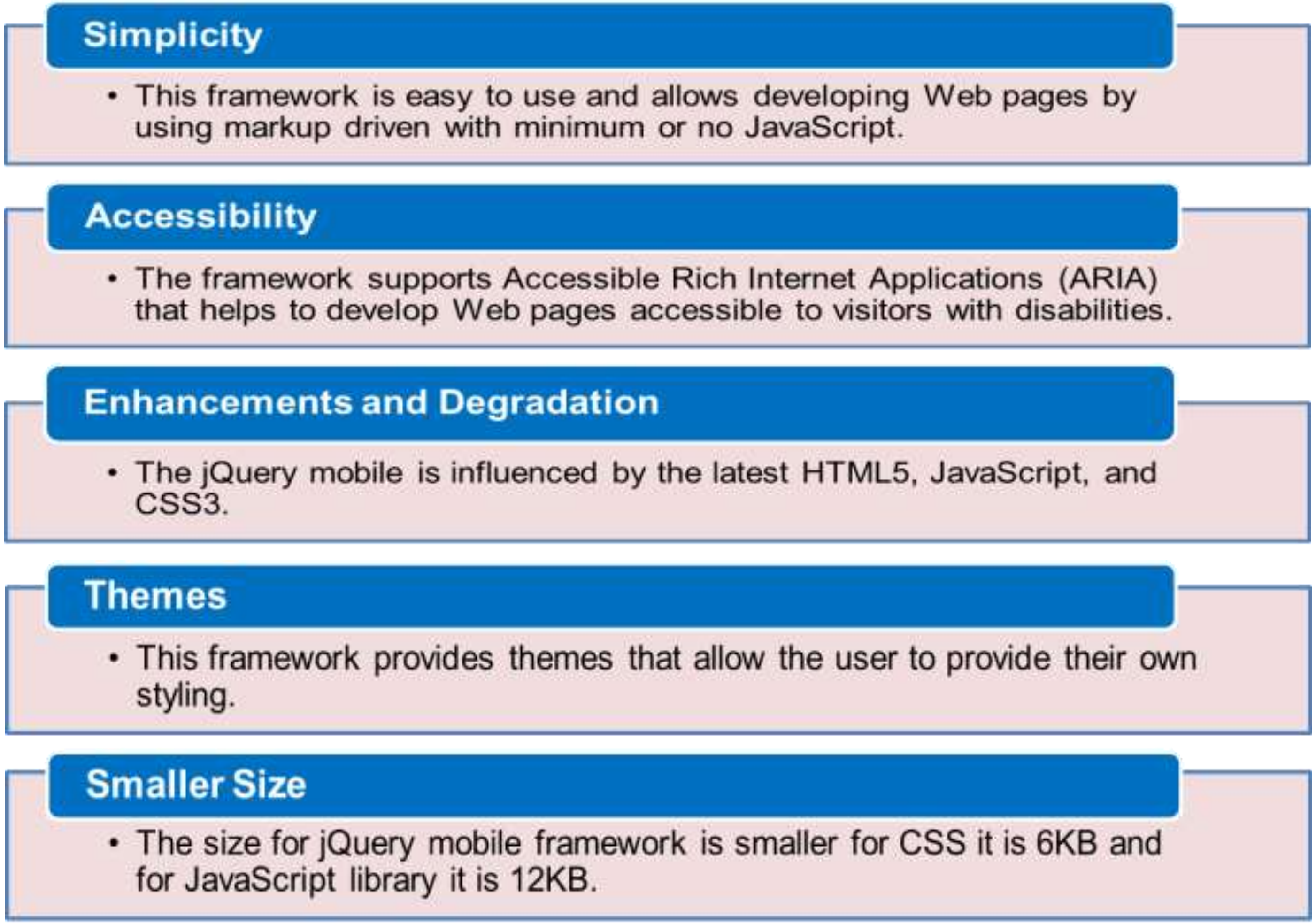
To work with jQuery perform the following steps:

1. Download the jQuery library from the **http://jquery.com/** Web site
2. Place the *jquery-1.7.2.min.js* file in the current directory of the Web site.

```
<!DOCTYPE HTML>
 <html>
  <head>
   <title>The jQuery Example</title>
    <script src=”jquery-1.7.2.min.js” >
        $(document).ready( function(){
        $(“div”).click(function(){
           alert(“Welcome JQuery!”);
        });
      });
       </script>
  </head>
  <body>
    <div id=‘first’>Click here !</div>
  </body>
</html>
```

jQuery Mobile

- is a Web UI development framework that allows to build mobile web apps that work on tablets and smartphones.



Simplicity

- This framework is easy to use and allows developing Web pages by using markup driven with minimum or no JavaScript.

Accessibility

- The framework supports Accessible Rich Internet Applications (ARIA) that helps to develop Web pages accessible to visitors with disabilities.

Enhancements and Degradation

- The jQuery mobile is influenced by the latest HTML5, JavaScript, and CSS3.

Themes

- This framework provides themes that allow the user to provide their own styling.

Smaller Size

- The size for jQuery mobile framework is smaller for CSS it is 6KB and for JavaScript library it is 12KB.

Summary

- Scripting refers to a series of commands that are interpreted and executed sequentially and immediately on an occurrence of an event.
- JavaScript is a scripting language, which can be executed on the client-side and on the server-side.
- A variable refers to a symbolic name that holds a value, which keeps changing.
- A primitive data type contains a single literal value such as a number, a string.
- A function is a piece of code that performs some operations on variables to fulfill a specific task.
- Event handling is a process of specifying actions to be performed when an event occurs.
- Event bubbling is a mechanism that allows you to specify a common event handler for all child elements.
- jQuery mobile is a Web User Interface development framework that allows the user to build mobile Web applications that works on tablets and smartphones.