Usman Institute of Technology

Department of Computer Science

Course Code: SE319

Course Title: Web Engineering

Fall 2022

Lab 01

Objective:

This experiment introduces the students to Elementary concepts of HTML, CSS and JS.

Student Information

Student Name	
Student ID	
Date	

Assessment

Marks Obtained	
Remarks	
Signature	

Department of Computer Science
CS335 - Computer Graphics

Lab 01

Instructions

State the instruction that student needs to follow for performing the example and exercises. Some sample instructions are given below which can be altered as needed
E.g.

- Come to the lab in time. Students who are late more than 15 minutes, will not be allowed to attend the lab.
- Students have to perform the examples and exercises by themselves.
- Raise your hand if you face any difficulty in understanding and solving the examples or exercises.
- Lab work must be submitted on or before the submission date.

1. Objective

This experiment introduces the students to Elementary concepts of HTML, CSS and JS.

2. Theory

HTML (Hypertext markup language) is used to structure the document. It provides many elements (called TAGS) for different purposes like creating the title of the document, adding headings, creating paragraphs, positioning elements, adding content etc.

CSS (Cascading stylesheet) is used to beautify and style the document. The purpose of CSS is to enhance the look and feel of the document so that it is neat, easier to read and follow. It does so by adding some styling rules to the elements. There are many ways style can be added for the elements of the document which include inline styling, styling under the Style tag or in a separate CSS file. CSS styling rules work in cascading fashion, i.e., the most specific and nearer to the document gets applied first.

JS (JavaScript) adds interaction capability to the document. Its main responsibility is to respond against various events going on in the life cycle of the HTML document. When any event like clicking on the button occurs, JS can be used to decide what to do with that button Click event. It can be used to take input from the user and generate output for her upon any interaction like when the download is completed, it can notify her of the download completed state via handling downloadCompeted event etc.

JavaScript (JS) is a scripting language which is run by the browser. It is also called a client-side language. The JS engine available in the browser parses the JS code and executes it. There are different types of functionality available in JS which can be used to perform different operations like manipulating the DOM (Document Object Model – a memory representation of HTML), interacting with the server using AJAX (Asynchronous JavaScript and XML – a set of APIs available for interactions with the server), scheduling the operations using timers (setTimeout and setInterval), using browser features a.k.a, BOM (Browser Object Model) which include doing navigation, using cookies, sessions, cookies etc.

JS provides different building blocks to write a program which include variables, functions, objects, loops, data types, events etc. Besides basic building blocks we have APIs (Application Programming Interface – basically methods or functions) for manipulating DOM, CSS and BOM among others.

3. Java Script Statements

Task 1
Write the following program in IDE, this program tells the browser to write “Hello! Web Engineering Class.” inside an HTML element with id=“demo”.

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <h2>JavaScript Statements</h2>
        <p id="demo"></p>
        <script>
            document.getElementById("demo").innerHTML = "Hello! Web
Engineering Class.";
        </script>
    </body>
</html>
```

4. Java Script Variables

JavaScript variables are containers for storing data values. In this example, x, y, and z, are variables:

Task 2
Write the following program in IDE, this program add two values of x & y in the z variables and write the value of variable z inside an HTML element with id=“demo”.

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <h2>JavaScript Variables</h2>
        <p id="demo"></p>
        <script>
            var x = 5;
            var y = 6;
            var z = x + y;
            document.getElementById("demo").innerHTML = z;
        </script>
    </body>
</html>
```

5. Java Script Functions

JavaScript function is a block of code designed to perform a particular task. A JavaScript function executed when "something" invokes it (calls it).

Task 3

Write the following program, which has a function that takes two parameters and multiply them and return the value to place inside an HTML element with id="demo".

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <p id="demo"></p>
        <script>
            function myFunction(p1, p2)
            {
                return p1 * p2;
            }
            document.getElementById("demo").innerHTML = myFunction(4, 3);
        </script>
    </body>
</html>
```

Task 4

Write the following program, which helps you to understand the inScope & outScope variables.

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <script>
          //Variables using var keyword – They are scoped within the
function in which they are declared. Different data type are available
like number, string, boolean, date etc.
        function helloFunctionScopedVariables() {
            var a = 1;
            var b = "Hello Student";
            var c = true;
            var d = new Date();

            if (a>=1)
            {
                var e = 2;
            }

            console.log('Function Scoped');
            console.log(a);
            a = e;
```

```
            console.log(a);
            console.log(b);
            console.log(c);
            console.log(d);
            console.log(e);
        }
        //Variables using let and const keywords - They are scoped within
the
        //braces "{""}"
        function helloBracesScopedVariable() {
            const PI = 1.421; //Once assigned, its value can never be
modified
            let a = 1;
            let b = "Hello Student";
            let c = true;
            let d = new Date();

            console.log('BRACES SCOPED');
            if(a>=1)
            {
                let e = 2;
                console.log(e);
            }
            console.log(a);
            console.log(b);
            console.log(c);
            console.log(d);
            a = e; //Error - "e is not defined" as e is scoped within the
            //braces and not available outside of it
        }

        helloFunctionScopedVariables();
        helloBracesScopedVariable();

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

6. JavaScript Loop & Arrays

An array can hold many values under a single name, and you can access the values by referring to an index number.

Loops can execute a block of code a number of times. Loops are handy, if you want to run the same code over and over again, each time with a different value.

Often the loop is use when working with arrays.

Task 5

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <script>
            //Define a teacher object using literal syntax
            let teacher = {
                id: 123,
                name: "teacher1",
                age: 35,
                class: "CS",
                dob: new Date(1986, 10, 10),
                isGoldMedalist: true
            };

            //Define multiple student objects with the help of a loop
            let students = []; //Start with empty list of students
            for(let s = 0; s < 10; s++) {
                let student = {
                    id: s + 1,
                    name: "student" + (s + 1),
                    age: 19 + s,
                    class: "HTML,CSS,JS",
                    dob: new Date(2002 + s, 10, 10),
                    isGoldMedalist: false
                };
                  students.push(student); //insert newly created student
into students array using array's method push
            }

              //function is created using function expression. Functions
are objects like other normal objects
            let printTeacherName = function(teacher, noOfTimes)
            {
                let t = 1;
                while(t++ <= noOfTimes)
                {
                    console.log(teacher.name);
                }
            };

            console.log(printTeacherName.name);
            printTeacherName(teacher, 3);
            printTotalStudentsLength();
```

```
            //function is created using arrow syntax.
            const calculateStudentsCombinedAge = () => {
                let studentsCombinedAge = 0;
                for(let s = 0; s < students.length; s++)
                {
                    studentsCombinedAge += students[s].age;
                }
                return studentsCombinedAge;
            };

            console.log(calculateStudentsCombinedAge.name);

            let combinedStudentsAge = calculateStudentsCombinedAge();
            console.log(combinedStudentsAge);

            //function is created using declaration syntax
            function printTotalStudentsLength() {
                console.log(students.length);
            }

            console.log(printTotalStudentsLength.name);
        </script>
    </body>
</html>
```

Task 6

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <input id="loginId" type="text" />
        <input id="password" type="password" />
        <input id="rememberMe" type="checkbox" />
        <script>
            const loginIdElement = document.querySelector('#loginId');
            const passwordElement = document.querySelector('#password');
            const rememberMeElement =
document.querySelector('#rememberMe');
            const inputs = [loginIdElement, passwordElement,
rememberMeElement];
            //Sequential looping over the elements array using for loop
            for(let i = 0; i < inputs.length; i++)
            {
                console.log(inputs[i].attributes["type"].value);
                const inputObject = inputs[i];
```

```
                //looping over object properties using for-in loop
                for(let prop in inputObject)
                {
                    console.log(prop);
                    console.log(inputObject[prop]);
                }

                //looping over object properties using for-of loop
                for(let propertyValue of inputObject.getAttributeNames())
                {
                    console.log(propertyValue);
                }
            }
        </script>
    </body>
</html>
```

7. JavaScript Events

Task 7

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
        <style type="text/css">
            #divstyle{
                display:none;
                width: 200px;
                background:#006;
                color:#FFF;
            }
        </style>
    </head>
    <body>
        <input type="button" value="Click Me" onClick="myFunction()" />
        <div ID="divstyle">
            <p>This is dummy text.</p>
        </div>
        <script>
            function myFunction() {
                document.getElementById('divstyle').style.display =
"block";
            }
        </script>
    </body>
</html>
```

Task 8

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <body>
        <input type="text" placeholder="Enter some value"
onchange="valueIsChanged(this)" />
        <input type="button" value="Log Current Date and Time"
onclick="logCurrentDateTime()" />
            <script>
            //This function will be executed whenever the value is
changed in the textbox, and will log old and new values for textbox
            function valueIsChanged(e) {
                console.log(`Current value is: ${e.value}`);
            }

            //This function will be executed whenever the button is
clicked, and will log the current date and time using DateTime object's
now() function
            function logCurrentDateTime() {
                console.log(new Date());
            }
            </script>
    </body>
</html>
```

8. JavaScript – Document structuring using Elements

Task 9

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab#1 – HTML, JS, and CSS Fundamentals</title>
    </head>
    <style>
        *{
            margin: 0;
            border: 0;
            padding: 0;
        }
        #uni-pic {
            border: 1px black solid;
            width: 100%; height: 100%; float: left;
        }
```

```
        .wrapper {
            font-family: arial, sans-serif;
            height: 600px;
            width: 90%;
            margin: 0 auto;
        }
        .content .faculty {
            clear: left;
        }
        .content table {
            color: blue;
        }
        p {
            color: green;
            text-align: center;
        }
    </style>
    <body>
        <div class="wrapper">
            <div class="header">
                <h1>Welcome to Usman Institute of Technology</h1>
                <h2>With state-of-the-art labs</h2>
                <h3>And best faculty available in the Karachi</h3>
            </div>
            <div class="content">
                <div class="content-block introduction">
                    <h3>Introduction</h3>
                    <p class="welcome">
                        <img id=”uni-pic” class="university-picture"
src="https://www.uit.edu/assets/images/newUITLogo47.png" alt="UIT" />
                        Usman Institute of Technology, founded in 2000,
is one of the best universities operating in Pakistan
                        and is known for its outstanding contribution
towards polishing the students as to be ready for serving
                        in the IT industry and at the same time focus on
the new and emerging technology to be at the disposal
                        of the students acquiring the expertise to be
used in the IT sector.
                    </p>
                </div>
                <div class="content-block faculty">
                    <h3>Faculty</h3>
                    <table>
                        <thead>
                            <th>Name</th>
                            <th>Qualification</th>
                            <th>Year of Joining</th>
                            <th>Visiting Hours</th>
                        </thead>
```

```
                        <tbody>
                            <tr>
                                <td>Teacher1</td>
                                <td>phD</td>
                                <td>2015</td>
                                <td>08:00AM - 01:00PM</td>
                            </tr>
                            <tr>
                                <td>Teacher2</td>
                                <td>phD</td>
                                <td>2010</td>
                                <td>09:30AM - 02:30PM</td>
                            </tr>
                            <tr>
                                <td>Teacher3</td>
                                <td>Masters</td>
                                <td>2012</td>
                                <td>10:00AM - 03:00PM</td>
                            </tr>
                        </tbody>
                    </table>
                </div>
                <div class="content-block courses">
                    <h3>Courses</h3>
                    <ul>
                        <li><a href="JS.html">Javascript</a></li>
                        <li><a href="HTML.html">HTML</a></li>
                        <li><a href="CSS.html">CSS</a></li>
                        <li><a href="SW.html">Service Workers</a></li>
                    </ul>
                </div>
            </div>
        </div>
    </body>
</html>
```

9. Lab Task

1. Create a *Login Form* using HTML
   a. Add Title (using h1 or h2 tag)
   b. Add a div
   c. Add a *form* element within the *div*
   d. Add Login ID, Password textboxes and group them in a section (using *div* for section and <*input type=”text”* … for textboxes) and put the section under the *form*
   e. Set Login ID and Password as mandatory inputs (using *required* element attribute)
   f. Add OK and Cancel buttons (using <input type=”button” …..)

2. Add styling to the *Login Form* using CSS

a. Create a separate style file and link it with HTML file within the <*head*> section using <*link*> tag
b. Add color to title, labels, inputs, and buttons text (color)
c. Add borders to the textboxes (pixels, color, and border style)
d. Right-align labels (using text-align of the parent/containing element)
e. Add border to the *form* element (same as step but with different color)
f. Center-align the form on the screen (using *width* and *margin-left* and *margin-right* set as *auto*)

3. Add interactions for its OK and Cancel buttons using JS
   a. Add click event for both OK and Cancel buttons (using *onclick* element event attribute)
   b. When OK button is clicked, show alert with "Login is clicked" message (using *alert("yourMessage")*)
   c. When Cancel button is clicked, show alert with "Cancel is clicked" message (same as step b)

10. Homework Tasks