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# Department of Computing

**CS-344: Web Engineering**

**Class:** BESE-11AB

# Lab 06: JavaScript

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# Lab 06: JavaScript

### Introduction:

JavaScript is a well-known scripting language which is widely used to handle behavior of a web site. Most of modern websites use JavaScript and JavaScript based frameworks to control dynamic behavior at the client side. Students have learned basic concepts of JavaScript during lectures. This lab will help them to get practical knowledge of JavaScript.

### Lab Objectives:

The objective of this lab is helping students to familiarize themselves with basic concepts of JavaScript by practically implementing them in a given situation. The knowledge, students have gained in the lectures will help students to develop and control dynamic behavior of a web page using JavaScript.

### Tools:

Notepad, browser.

### Helping Material:

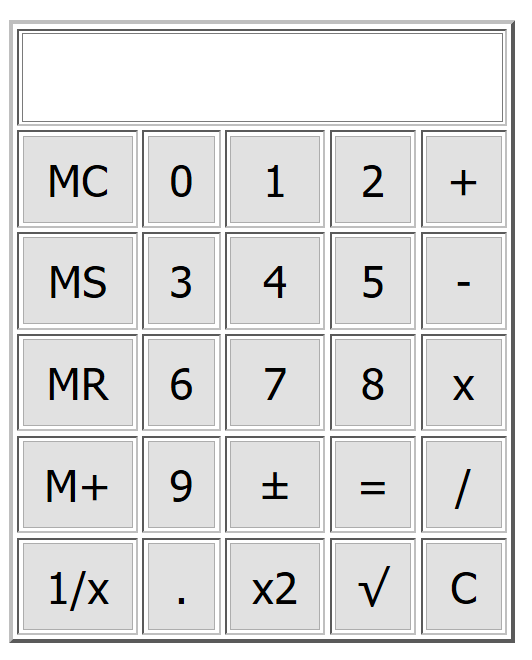
Lecture slides.

W3Schools: <https://www.w3schools.com/js/default.asp>

### Lab Task

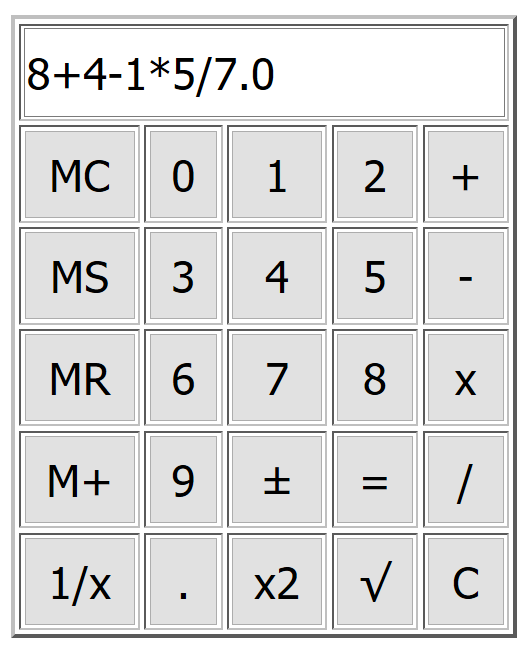
### Task 1

Create a simple web based calculator as shown in the image below.



Following are the important functionalities of the calculator:

1. Whenever a user presses any number (0-9) or operations (+,-,x,/,±, .), it must be shown in the input text field (see example image below).



1. In case of ‘.’ button pressed, a ‘0’ must be added at the end of the string as shown in above image.
2. When ‘=’ button is pressed result is shown in the text field.
3. ‘C’ button must clear and reset everything (text field, any storage variables).
4. For a given input N, ‘1/x’ should give the results of 1/N (e.g. input =5, result = 0.20) of the given input.
5. For a given input N, ‘x2’ should square the input (e.g. input =5, result = 25).
6. The square root button, ,should calculate the square root of the input.
7. The ‘±’ button should add/remove a ‘–’ sign to the input value.
8. MS button must store the numeric input value written in the text field in a variable. In case of an equation as shown in the image above, it should not store anything.
9. MC button should clear stored numeric value.
10. MR button should recall the stored value and display it in the input text field.
11. M+ button should add the input value given in the text field in to the stored value in memory and save it as stored value.

**Hints:**

1. JS ‘OnClick’ event will be attached to all buttons in the calculator.
2. To handle value storage (MS, MC, MR, M+), create a global variable, M, and change its value according to the button pressed.
3. To display inputs as a sequence of numbers and arithmetic operation (e.g. 2+3-5+7/2.5), use string concatenation.
4. You can use JS eval() function to directly execute a string as a JS statement. See example below:

var input= “2+3-5+2.5/2.5”;

eval(input); // output: 1.0

1. Keep in mind point 4 on eval(), when “=” button is pressed just call var result = eval(document.getElementByID(“inputTextField”).value);
2. In case of any questions, take help from your lab engineer.

**Note: Create a single file with HTML, CSS, and JavaScript and paste a few screenshots of your solution in the box below.**

|  |
| --- |
| Solution |
| Task 1 Screenshots:    Task 1 (HTML, CSS, JS):  <!DOCTYPE html>  <html>    <head>      <meta charset="utf-8" />      <meta http-equiv="X-UA-Compatible" content="IE=edge" />      <title></title>      <meta name="description" content="" />      <meta name="viewport" content="width=device-width, initial-scale=1.0" />      <style>        tr button {          width: 100%;          height: 60px;          background-color: black;          color: white;          border: 5px dotted green;        }        tr input {          width: 98%;          height: 50px;          margin: auto;          font-size: large;          border-radius: 15px;          background-color: black;          color: white;          border: 5px dotted green;        }        span{          font-size: 8px;        }        h1 {          text-align: center;        }        table {          width: 40%;          border-radius: 15px;          border: 5px solid blue;        }        @media screen and (max-width: 1000px) {          table {            width: 60%;            color: white;          }      }        @media screen and (max-width: 600px) {          table {            width: 90%;          }        }      </style>    </head>    <body>      <h1>Calculator</h1>          <table align="center" border="2px">          <tr>            <td colspan="5">              <input id="input" disabled type="text" name="input"/>            </td>          </tr>          <tr>            <td><button onclick="MS=''">MC</button></td>            <td><button onclick="inputhandler(this)" value = '1' >1</button></td>            <td><button onclick="inputhandler(this)" value = '2' >2</button></td>            <td><button onclick="inputhandler(this)" value = '3' >3</button></td>            <td><button onclick="operatorhandler(this)" value = "+" >+</button></td>          </tr>          <tr>            <td><button onclick="mshandler()">MS</button></td>            <td><button onclick="inputhandler(this)" value = '4' >4</button></td>            <td><button onclick="inputhandler(this)" value = '5' >5</button></td>            <td><button onclick="inputhandler(this)" value = '6' >6</button></td>            <td><button onclick="operatorhandler(this)" value = "-" >-</button></td>          </tr>          <tr>            <td><button onclick="mrhandler()">MR</button></td>            <td><button onclick="inputhandler(this)" value = '7' >7</button></td>            <td><button onclick="inputhandler(this)" value = '8' >8</button></td>            <td><button onclick="inputhandler(this)" value = '9' >9</button></td>            <td><button onclick="operatorhandler(this)" value = "\*" >X</button></td>          </tr>          <tr>            <td><button onclick="mplushandler()">M+</button></td>            <td><button onclick="plusminushandler()">+-</button></td>            <td><button onclick="inputhandler(this)" value = '0' >0</button></td>            <td><button onclick="equalhandler()">=</button></td>            <td><button onclick="operatorhandler(this)" value = "/" >/</button></td>          </tr>          <tr>            <td><button onclick="inversehandler()">1/X</button></td>            <td>              <button onclick="dothandler()" value=".">&#x2022 </button>            </td>            <td><button onclick="operatorhandler(this)" value = '\*\*(2)' >x2</button></td>            <td><button onclick="operatorhandler(this)" value = '\*\*(1/2)' >\/```</button></td>            <td><button onclick="clearhandler()">C</button></td>          </tr>        </table>      <script>        var MS;        function clearhandler(){          MS = '';          document.getElementById('input').value = '';        }        function mplushandler(){          let inputtext = document.getElementById('input').value;          let input = eval(inputtext);          let ms = eval(MS);          MS = input + ms;          document.getElementById('input').value = '';        }        function mrhandler(){          document.getElementById('input').value = document.getElementById('input').value + MS;        }        function mshandler(){          let inputtext = document.getElementById('input').value;          let i = inputtext.length;          while(i>=0){            let char = inputtext.slice(i,i+1);            if(char === '+' ||char === '-' ||char === '\*' ||char === '/' ){              return;            }            i--;          }          MS = inputtext;          document.getElementById('input').value ='';        }        function plusminushandler(){          let inputtext = document.getElementById('input').value;          let initialcharts = document.getElementById('input').value.slice(0,2);          let newstring = document.getElementById('input').value.slice(2);          if(initialcharts === '-(' ){            document.getElementById('input').value = '+(' + newstring;          }else if(initialcharts === '+('){            document.getElementById('input').value = '-(' + newstring;          }else{            document.getElementById('input').value = '-(' + inputtext + ')';          }        }        function inversehandler(){          let newinput = '1/('+ document.getElementById('input').value + ')';          document.getElementById('input').value = eval(newinput);        }        function equalhandler(){          let result = eval( document.getElementById('input').value);          document.getElementById('input').value =  result;        }        function dothandler(){          let inputtext = document.getElementById('input').value;          let lastchar = inputtext.slice(-1);          if(lastchar === '.'){            document.getElementById('input').value = inputtext + '0';          }else{            let i = inputtext.length;            while(i>=0){              let char = inputtext.slice(i,i+1);              if(char === "."){                return;              }              else if(char === '+' ||char === '-' ||char === '\*' ||char === '/' ){                if( lastchar === '+' ||lastchar === '-' ||lastchar === '\*' ||lastchar === '/' ){                  document.getElementById('input').value = inputtext + '0.0';                }else{                  document.getElementById('input').value = inputtext + '.0';                }                return;              }              else if(char === ')' ){                return;              }              else{                i--;              }            }            document.getElementById('input').value = inputtext + '.0';          }        }        function operatorhandler(operator){          let inputtext = document.getElementById('input').value;          let lastchar = inputtext.slice(-1);          if(lastchar === '+' ||lastchar === '-' ||lastchar === '\*' ||lastchar === '/' ){            if( operator.value === '+' || operator.value === '-' ||operator.value === '\*' || operator.value === '/' ){              text = inputtext.slice(0, -1);            }            else{              text = inputtext;            }          }          else if(lastchar === '.'){              text = inputtext + '0';        }          else{            text = inputtext;          }          document.getElementById('input').value = text + operator.value;        }        function inputhandler(input) {          let inputtext = document.getElementById('input').value;          document.getElementById('input').value = inputtext + input.value;      }        </script>    </body>  </html> |

### Deliverables

Compile a single word document by filling in the solution part and submit this Word file on LMS. You must include your name, ID, and class on first page. The lab grading policy is as follows: The lab is graded between 0 to 10 marks. For some of the labs, students have to present their solutions in a viva session. In case of any problems with submissions on LMS, you should contact your lab engineer Ms. Ayesha Asif by email at [ayesha.asif@seecs.edu.pk](mailto:ayesha.asif@seecs.edu.pk).