Lab 5: Web Programming - CSci130

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Please keep the different documents that you are creating during the lab sessions as they can be used to assess your participation to the course.

Goals: The goal of this lab is to create a calculator that can compute different expressions by pressing different buttons on the graphical user interface (GUI) of the calculator. Each function will be represented by a button. The calculator has other elements related to the representation of data, and for matrices.

Learning outcomes: Javascript syntax, Form in HTML5, Document Object Model

In this session, you may reuse functions that were developed in previous sessions.

It is a group activity. In each table, you have to create webpages corresponding to different functionalities. There are 3 parts. So you may distribute the 3 parts across students around the table. Before the end of the session (4h40), each table will briefly show what they were able to do.

Therefore, you will have to work as a **group**, where each person can work on a part of the calculator pages.

The calculator has **3** parts:

1. **Part 1 (page 1)**
   a. You have a layout with the 10 digits [0 to 9], you have the point for decimal values (.), buttons for the addition (+), subtraction (-), multiplication (*), division (/), square root (sqrt), inverse the sign (+/-), and reset (CE). You have also a button "=" to evaluate the current expression. In this project, the expressions will be evaluated by pairs. You don't need to create a particular data structure to contain the whole expression and to take into account the priorities of the operators.
   b. You have a textbox that contains the value of the current number that is written with the buttons, or the current results.
   c. You have a textbox that contains the complete sequence of the different numbers and operators that are entered on the calculator.
2. **Part 2 (page 2)**
   a. You have a button that allows you to determine the number of values (n) in a vector. This button creates n cells where it is possible to insert a new value. (see dynamic table)
   b. You will have buttons to compute the min, max, mean, and standard deviation of the elements contained in this vector.
   c. You will have divs in each cell to represent **graphically** the value of an element
      - Min value: height = 0px for the div
      - Max value: height = 100px for the div

3. **Part 3**
   a. 4 inputs can allow you to determine the size of 2 matrices A and B of size (n1 x m1) and (n2 x m2), respectively.
   b. With a button to validate the 4 inputs, the script will create 2 tables where it is possible to fill the cells of A and B.
   c. You will have between the 2 matrices A and B a combo box that allows you to select an operation: addition (+), subtraction (-), multiplication (*). You will have to control that the size of the matrix is appropriate for the selected operations. Finally, you will display the result of the operation (matrix C) of the right side. Example: A * B = C.
      - A is a table dynamically created in relation to its specified size.
      - The operator (a combo box)
      - B is a table dynamically created in relation to its specified size.
      - = is just a paragraph
      - A is a table dynamically created in relation to A and B
   d. Under each matrix, you have a button to compute the transpose of the matrix, and a button to compute the trace of the matrix.