

**Title:** Arithmetic Mean Calculator

**Key Concepts:** arrays, loops, iteration

## Overview

---

In this lab, you will program a simple dataset calculator that allows users to input numerical data, remove entries, and compute the arithmetic mean (average). This exercise will reinforce the use of arrays in JavaScript and the use of for loops to process data.

## Part 1: Data Entry

---

Create a new webpage for the arithmetic mean calculator. On the webpage, add a single text input field and two buttons.

**Text input field.** Field for the user to enter a number.

**Button: Add Value.** Adds the entered number to a dataset.

- Convert the user input to a number and validate to ensure it is numerical.
- If the value is a number, add it to a JavaScript array. (You will want the array to have global scope, as it will be accessed by multiple functions in this lab.)
- If the value is not a number—`isNaN()`—display an error message to the user. You may use an alert dialog box for this message.
- Display the updated dataset on the webpage.

**Button: Remove Value.** Removes the entered number from the dataset.

- Convert the user input to a number and validate to ensure it is numerical.
- If the value is not a number—`isNaN()`—display an error message to the user. You may use an alert dialog box for this message.
- If the value is a number, check to see if it exists in the JavaScript array.
  - If the value does not exist in the array, display an appropriate error message to the user. You may use an alert dialog box for this message.
  - If the value exists, remove it from the array.
- Display the updated dataset on the webpage.

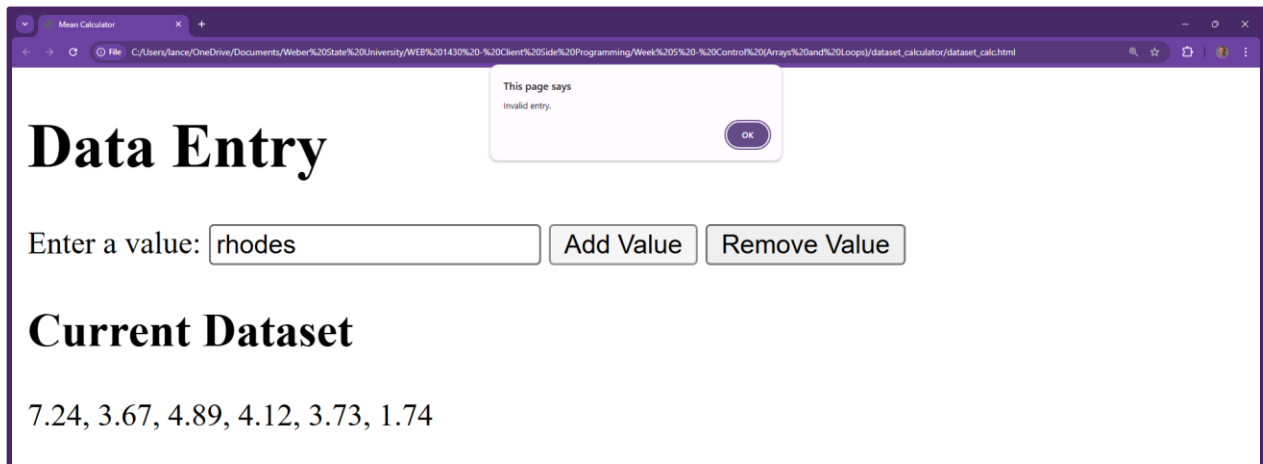
Sample sessions are provided on the next page.

Sample data entry:



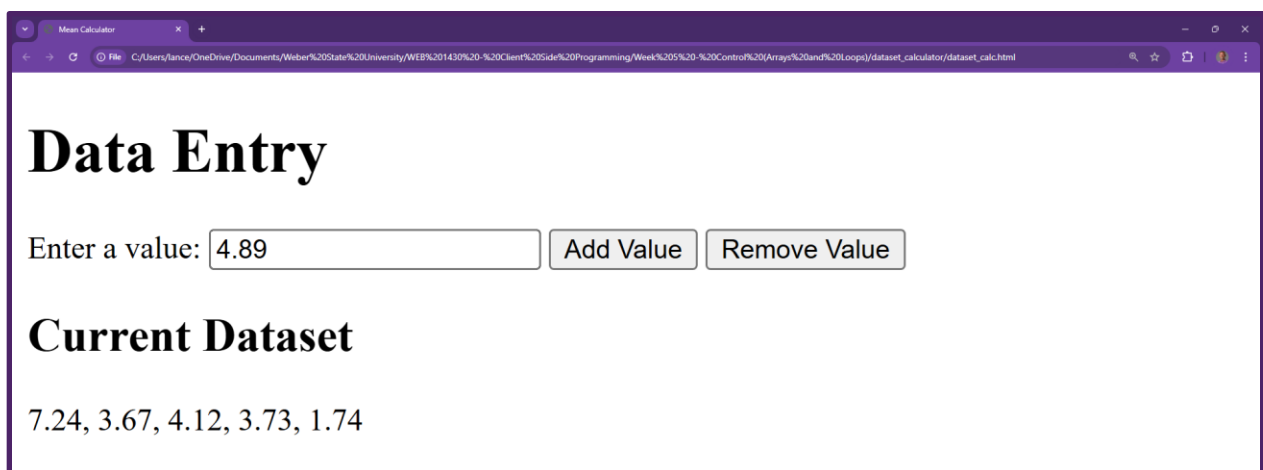
The screenshot shows a web browser window titled "Mean Calculator". The address bar shows the file path: C:/Users/lance/OneDrive/Documents/Weber%20State%20University/WEB%201430%20-%20Client%20Side%20Programming/Week%205%20-%20Control%20Arrays%20and%20Loops/dataset\_calculator/dataset\_cal.html. The page has a large heading "Data Entry". Below it, there is a text input field containing "1.74", followed by "Add Value" and "Remove Value" buttons. Underneath, the heading "Current Dataset" is followed by the text "7.24, 3.67, 4.89, 4.12, 3.73".

Sample invalid input (entry):



The screenshot shows the same web browser window. A modal dialog box is displayed in the center with the text "This page says" and "Invalid entry." below it, and an "OK" button. The "Data Entry" section now has the text input field containing "rhodes". The "Current Dataset" section now shows "7.24, 3.67, 4.89, 4.12, 3.73, 1.74".

Sample data removal:



The screenshot shows the web browser window. The "Data Entry" section has the text input field containing "4.89". The "Current Dataset" section now shows "7.24, 3.67, 4.12, 3.73, 1.74", indicating that the value 4.89 has been removed from the previous dataset.

Sample item not found (removal):

The screenshot shows a web browser window with a tab titled 'Mean Calculator'. The address bar shows a file path. The main content area has a heading 'Data Entry'. Below it is a text input field containing the number '5'. To the right of the input field are two buttons: 'Add Value' and 'Remove Value'. Below these is a section titled 'Current Dataset' which displays the list of numbers '7.24, 3.67, 4.12, 3.73, 1.74'. A small modal box at the top center of the page content area displays the message 'This page says 5 not found.' with an 'OK' button.

## Part 2: Mean Calculator

Create a new JavaScript function to compute the arithmetic mean from the existing data set.

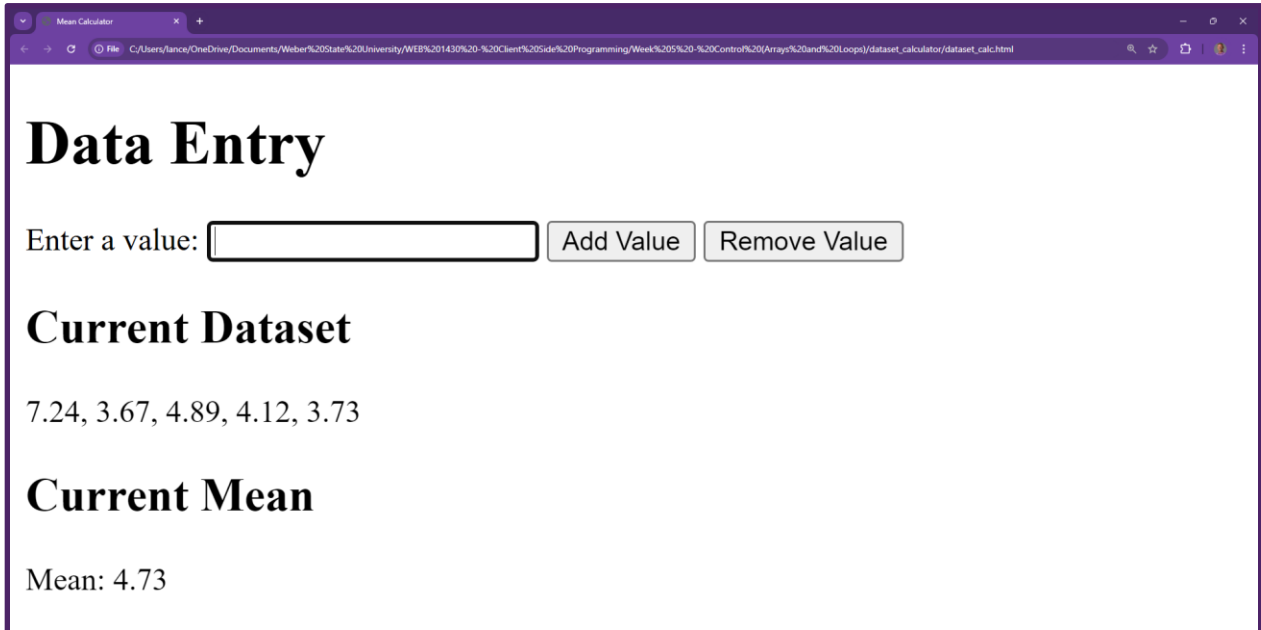
The arithmetic mean is given by the following formula:

$$\bar{x} = \frac{\sum x}{n}$$

- Use a for loop to iterate through the dataset, summing all values.
- Divide the total by the number of values in the dataset.
- Display the mean on the page. You may activate the mean function by:
  - Providing an additional button on the page (i.e. “Compute Mean”), OR
  - Computing the mean concurrently with data entry. (In other words, each time a value is added or removed, the mean is recomputed and displayed).

**Note:** You must use a loop to compute the arithmetic mean. Do not use existing libraries or functions. Doing so will result in a 0 for this part of the assignment.

Sample session:



**Data Entry**

Enter a value:

**Current Dataset**

7.24, 3.67, 4.89, 4.12, 3.73

**Current Mean**

Mean: 4.73

**Submission:** Add the mean calculator page to your portfolio website. Add a link to the mean calculator from your portfolio homepage. Once complete, submit the URL to your portfolio site online for grading.

**Important Note:** All work included in the project must consist of your own original work. Any portion deemed to contain *unoriginal* content, including but not limited to, source material copied from the internet or other external sources, even sources such as public domain or creative commons, and even works which may be considered derivative in nature (such as altering existing content) may be issued a 0 grade for this project.

Generative AI (e.g., ChatGPT, DALL-E, OpenArt, Photoshop AI, etc.) should not be used in the formulation of any part of this or any other lab or assignment. Copying and/or modifying material from the internet or other external sources is also unacceptable. Use of AI or external resources in *any* capacity may result in a score of 0. Labs and assignments cannot be redone.

**Grade Breakdown**

Grade Breakdown	
A functional link to the mean calculator webpage has been added to your portfolio site; a functional link to the portfolio site has been submitted.	N/A
The input field and buttons are properly implemented.	15 points
Numbers can be successfully added to the dataset. The dataset updates dynamically on the page as numbers are added.	20 points
Numbers can be successfully removed from the dataset. The dataset updates dynamically on the page as numbers are removed.	20 points
There is proper handling of cases where input is invalid, or a number is not found (removal).	20 points
Use of a for loop to sum dataset values and division by dataset length to correctly compute the mean. No library functions were used.	20 points
Mean is displayed on the page	5 points
<b>Total</b>	<b>100 points</b>