Project :- Calculator

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Contents

Abstract

This report presents the design and implementation of calculator, As we know that a calculator is a machine which allows us to do math operations more easily. For example,most calculators will add, subtract, multiply, and divide. Some also do square roots, and more complex calculators can help with calculus and draw function graphs. Calculators are found everywhere. You can even build a more advanced level calculator, but we will make a simple calculator.

1 Introduction

As we know that a calculator is a machine which allows us to do math operations more easily. For example, most calculators will add, subtract, multiply, and divide. Some also do square roots, and more complex calculators can help with calculus and draw function graphs. Calculators are found everywhere. You can even build a more advanced level calculator.However, more sophisticated calculators can handle exponential operations, square roots, logarithms, trigonometric functions and hyperbolic functions. Internally, some calculators perform all these functions by repeated addition processes.

2 Features

The main features of the project are:

- **Basic Arithmetic Operations:** : Supports addition, subtraction, multiplication, and division.
- **Clear Function:** Ability to reset the entire input.
- **Delete Function:** Allows deletion of the last character entered.
- **Real-time Input:**: Updates the display in real-time as buttons are clicked.

3 Technologies Used

The following technologies were used in the development of the calculater:

- **HTML:** Used for structuring the content on the web pages. HTML (HyperText Markup Language) forms the backbone of web pages by defining the structure and hierarchy of elements.
- **CSS:** Used for styling the web pages to make them visually appealing. CSS (Cascading Style Sheets) was employed to customize the appearance and layout of elements, ensuring a consistent and attractive user interface.
- **JavaScript:** Used for adding interactivity and dynamic content to the web pages. JavaScript, as a versatile scripting language, enabled the implementation of interactive features such as real-time updates and client-side validation.

4 Implementation

The implementation of the calculator involved leveraging modern web development technologies to create a responsive calculator. Below, we'll explore each component — HTML, CSS, and JavaScript — used in the project.

4.1 HTML Structure

The HTML structure serves as the foundation, defining the layout of the calculator. Here's an overview of the main HTML code:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=<device-width>, initial-scale=1.0">
        <link rel ="stylesheet" href="newpage.css">
```

```
        <link rel ="stylesheet" href="newpage.js">
    <title>CALCULATOR BY SHEIKH HASEEB</title>
</head>
<body>
   <div class ="calculator">
    <input type ="text" placeholder="0" id="inputBox">
    <div>
    <button class="operator" >AC</button>
    <button class="operator">DEL</button>
    <button class="operator">%</button>
    <button class="operator">/</button>
</div>
    <div>
    <button>7</button>
    <button>8</button>
    <button>9</button>
    <button class="operator">*</button>
</div>
    <div>
    <button>4</button>
    <button>5</button>
    <button>6</button>
    <button class="operator">-</button>
</div>
    <div>
    <button>1</button>
    <button>2</button>
    <button>3</button>
    <button class="operator">+</button>
</div>
    <div>
    <button>00</button>
    <button>0</button>
    <button>.</button>
    <button class="equalButton">=</button>
</div>
   </div>


   <script src ="newpage.js"></script>
</body>
</html>
```

Listing 1: HTML Code for calculator

HTML Explanation

- **Meta Tags and Title**: Define character set, viewport for responsiveness, and set the title of the website shown in browser tabs.
- **Stylesheet and Script Links**: Include external CSS (‘newpage.css‘) and JavaScript (‘newpage.js‘) files for styling and functionality.

4.2 CSS Styling

CSS is used to style the elements and layout of the SoulScripts website, ensuring a visually appealing and consistent user interface.

```
/* newpage.css */

@import url('https://fonts.googleapis.com/css2?family=Poppins:wght@500&display=swap');

*{
    margin: 0;
    padding: 0;
    box-sizing: border-box;
    font-family: 'Poppins', sans-serif;
}

body{
```

```
    width: 100%;
    height: 100vh;
    display: flex;
    justify-content: center;
    align-items: center;
    background: linear-gradient(45deg, #0a0a0a, #3a4452);
}

.calculator{
    border: 1px solid #717377;
    padding: 20px;
    border-radius: 16px;
    background: transparent;
    box-shadow: 0px 3px 15px rgba(113, 115, 119, 0.5);

}

input{
    width: 320px;
    border: none;
    padding: 24px;
    margin: 10px;
    background: transparent;
    box-shadow: 0px 3px 15px rgbs(84, 84, 84, 0.1);
    font-size: 40px;
    text-align: right;
    cursor: pointer;
    color: #ffffff;
}

input::placeholder{
    color: #ffffff;
}

button{
    border: none;
    width: 60px;
    height: 60px;
    margin: 10px;
    border-radius: 50%;
    background: transparent;
    color: #ffffff;
    font-size: 20px;
    box-shadow: -8px -8px 15px rgba(255, 255, 255, 0.1);
    cursor: pointer;
}

.equalButton{
    background-color:#fb7c14;
}

.operator{
    color:#fb7c14;
}
```

Listing 2: CSS Code for calculator

CSS Explanation

- **Body**: Sets default font, line height, text color, and background color for the entire page.
- **Universal Selector**: The * selector targets all elements.(margin: 0;and padding: 0) remove default margins and padding. (box-sizing: border-box) ensures padding and borders are included in the element's total width and height. (font-family: 'Poppins', sans-serif) sets the default font for all elements to "Poppins" with a fallback to sans-serif.
- **Body Styling**: (width: 100 percent and height: 100vh) make the body take up the full viewport width and height. (display: flex) enables Flexbox layout. (justify-content: center and align-items: center) center the content horizontally and vertically. (background: linear-gradient(45deg, 0a0a0a, 3a4452) sets a diagonal gradient background from dark gray to a bluish-gray..

- **Input Field**: (width: 320px) sets a fixed width for the input field.(border: none) removes the default border. (padding: 24px) adds padding inside the input field. (margin: 10px) adds space around the input field.(background: transparent) makes the input background transparent. (box-shadow: 0px 3px 15px rgba(84, 84, 84, 0.1)) adds a subtle shadow. (font-size: 40px) sets a large font size for the input text. (text-align: right) aligns the text to the right.(cursor: pointer) changes the cursor to a pointer when hovering over the input field. (color: ffffff) sets the text color to white. input::placeholder color: ffffff; sets the placeholder text color to white.

4.3 JavaScript Functionality

JavaScript adds interactivity and dynamic content loading to the calculator. Here's how 'newpage.js' is implemented:

```
// newpage.js

let input = document.getElementById('inputBox');
let buttons = document.querySelectorAll('button');

let string = "";
let arr = Array.from(buttons);
arr.forEach(button => {
button .addEventListener('click', (e) =>{
    if(e.target.innerHTML== '=')
    {
string = eval(string);
input.value = string;
}
else if(e.target.innerHTML ==  'AC')
{  string = "";
input.value = string;
}
  else if (e.target.innerHTML == 'DEL'){
string = string.substring(0, string.length-1);

input.value = string;
}

else {
string += e.target.innerHTML;
input.value = string;  }


})

})
```

Listing 3: JavaScript Code for calculator

JavaScript Explanation

- This code creates a simple calculator using Javascript. It selects the input box (inputBox) and all buttons on the page. It then iterates through the buttons and adds a click event listener to each. When a button is clicked, the code checks its text content (innerHTML). If it's '=', the code evaluates the current expression in the input box (using eval) and updates the input value with the result. If it's 'AC', it clears the expression and input value. If it's 'DEL', it removes the last character from the expression and updates the input value. Otherwise, it appends the button's text to the current expression and updates the input value.

5 Conclusion

The calculator successfully meets the design and functional requirements.This project showcases your understanding of these core web development technologies and your ability to create a functional interactive application. While this is a basic calculator, it serves as a strong foundation for further development. You can now explore adding more complex mathematical operations, memory functions, or even a more user-friendly interface with improved design elements.

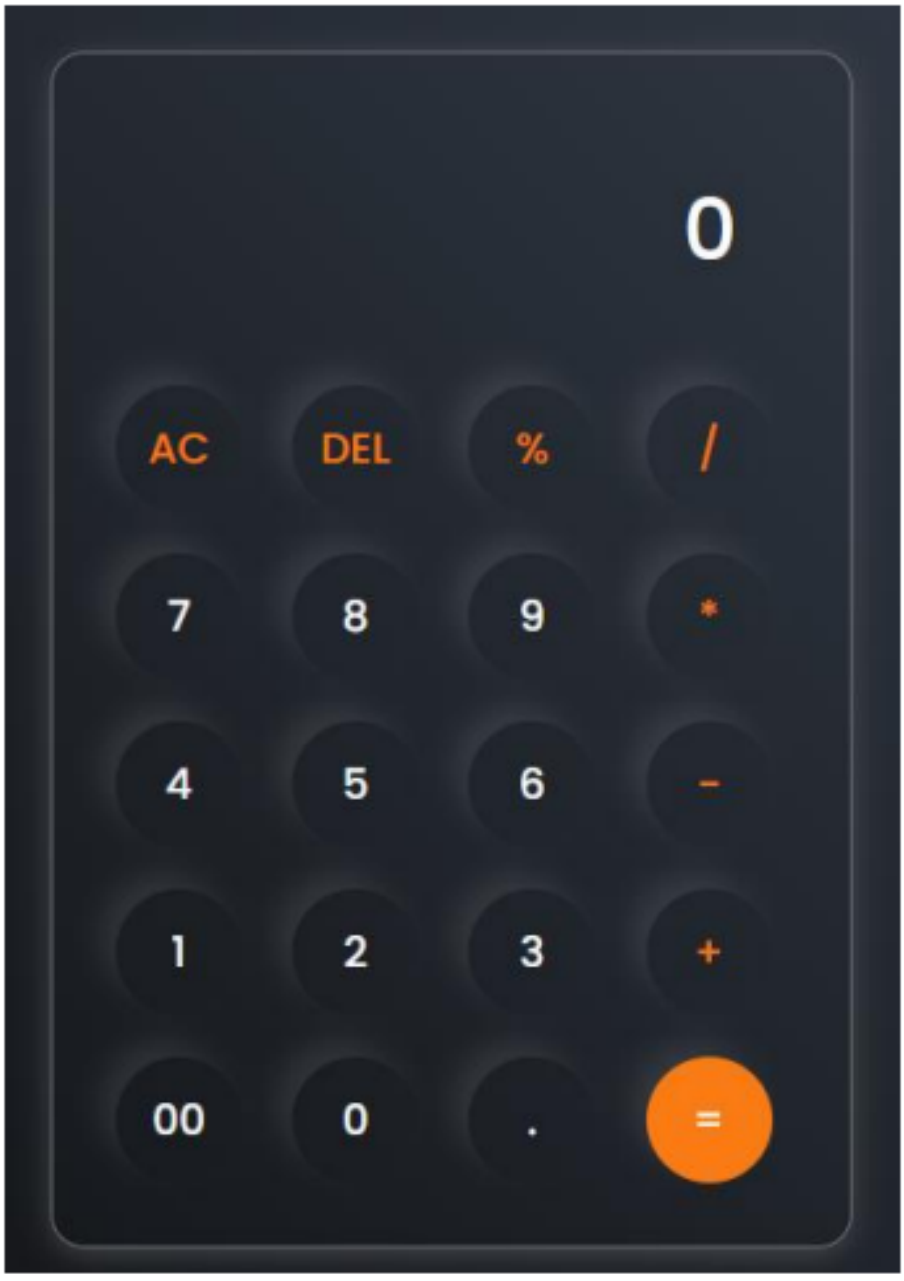

Figure 1: overview of calculator