**PART A**

(Part A: TO BE REFFERED BY STUDENTS)

**Experiment No. 05**

**A.1 AIM:**

Implement basic JavaScript operators, conditional statements, loops etc.

**A.2 Pre requisite:**

Basic Knowledge of HTML and JavaScript

**A.3 Outcome:**

After successful completion of this experiment students will be able to:

1. Create formatted web pages/websites with attractive look and feel
2. Use various JavaScript features

**A.4 Theory:**

JavaScript is the programming language of the Web. All modern HTML pages are using JavaScript.

JavaScript is one of **3** languages all web developers **MUST** learn:

1. **HTML** to define the content of web pages
2. **CSS** to specify the layout of web pages
3. **JavaScript** to program the behavior of web pages

**JavaScript operators**

**JavaScript operators** are symbols that are used to perform operations on operands.

There are following types of operators in JavaScript.

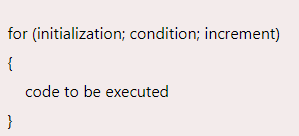
1. Arithmetic Operators
2. Comparison (Relational) Operators
3. Bitwise Operators
4. Logical Operators
5. Assignment Operators
6. Special Operators

**JavaScript Loops**

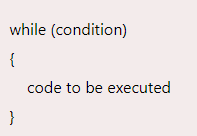
The JavaScript loops are used to iterate the piece of code using for, while, do while or for-in loops. It makes the code compact. It is mostly used in array.

There are three types of loops in JavaScript.

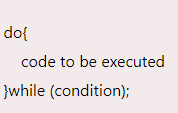
1. **for loop**



1. **while loop**

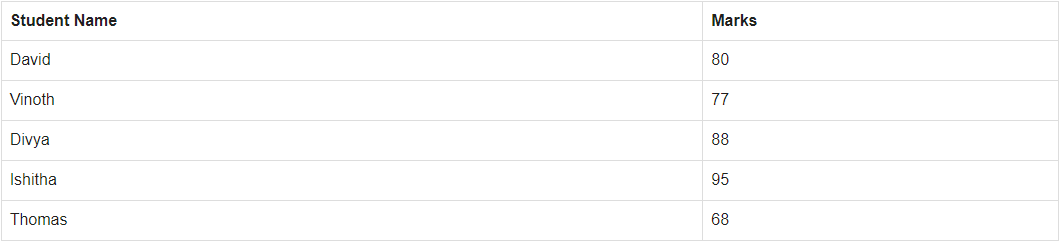


1. **do-while loop**

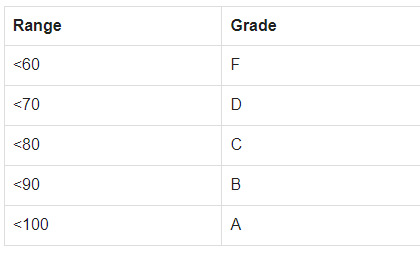


**A.5 Procedure/Task:**

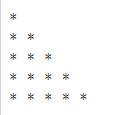
1. Write a JavaScript program to find the area of a triangle where lengths of the three of its sides are 5, 6, 7.
2. Write a JavaScript program to compute the sum of the two given integers. If the two values are same, then returns triple their sum.
3. Write a JavaScript function that reverse a number taking input from user using prompt box..
4. Write a JavaScript function that accepts a string as a parameter and converts the first letter of each word of the string in upper case.
5. Write a JavaScript conditional statement to find the largest of five numbers. Display an alert box to show the result.
6. Write a JavaScript program which compute, the average marks of the following students Then, this average is used to determine the corresponding grade.



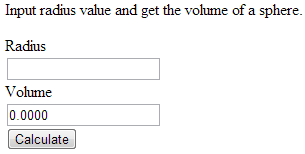
The grades are computed as follows:



1. Write a JavaScript program to construct the following pattern, using a nested for loop.



8. Write a JavaScript program to calculate sphere volume using form elements.  
Sample Output of the form :



9. WAP in java script to design a simple calculator and perform operation like add,,subtract, multiply and divide.

10. . Insert the JavaScript validations in those forms done in experiment html form *(All characters in a field validation, All Numbers in a field validation, Phone number validation, Password validation, Email id validation, Date format validation etc.)*

**PART B**

(PART B: TO BE COMPLETED BY STUDENTS)

(Students must submit the soft copy as per following segments within two hours of the practical. The soft copy must be uploaded on the Blackboard or emailed to the concerned lab in charge faculties at the end of the practical in case the there is no Black board access available)

|  |  |
| --- | --- |
| Roll No. : C035 | Name: Sukhada Gulhane |
| Class : B | Batch : B2 |
| Date of Experiment : | Date/Time of Submission : |
| Grade : |  |

**B.1 Code:**

*(Paste your Code here)*

***Task 1-5***

<!DOCTYPE *html*>

<html *lang*="en">

<head>

    <meta *charset*="UTF-8">

    <meta *name*="viewport" *content*="width=device-width, initial-scale=1.0">

    <title>JavaScript Programs</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            text-align: center;

            margin: 50px;

        }

        button {

            padding: 10px 20px;

            margin: 10px;

            font-size: 16px;

            cursor: pointer;

        }

    </style>

</head>

<body>

    <h2>JavaScript Programs</h2>

    <button *onclick*="*findTriangleArea*()">Find Triangle Area</button>

    <button *onclick*="*computeSum*()">Compute Sum</button>

    <button *onclick*="*reverseNumber*()">Reverse Number</button>

    <button *onclick*="*capitalizeWords*()">Capitalize Words</button>

    <button *onclick*="*findLargest*()">Find Largest Number</button>

    <script>

*//Find the Area of a Triangle using Heron's Formula*

        function *findTriangleArea*() {

            leta=5,b=6,c=7;

            lets=(a+b+c)/2;

            letarea= *Math.sqrt*(s\*(s-a)\*(s-b)\*(s-c));

*alert*("The area of the triangle is: " + *area.toFixed*(2));

        }

*//Compute the Sum of Two Integers (Triple Sum if Same)*

        function *computeSum*() {

            letnum1= *parseInt*(*prompt*("Enter first number:"));

            letnum2= *parseInt*(*prompt*("Enter second number:"));

            if (*isNaN*(num1) || *isNaN*(num2)) {

*alert*("Please enter valid numbers.");

*return*;

            }

            letresult=(num1===num2)?3\*(num1+num2):num1+num2;

*alert*("The computed sum is: " + result);

        }

*//Reverse a Number (User Input)*

        function *reverseNumber*() {

            letnum= *prompt*("Enter a number:");

            if (*isNaN*(num)) {

*alert*("Please enter a valid number.");

*return*;

            }

            letreversedNum= *num.split*("")*.reverse*()*.join*("");

*alert*("Reversed Number: " + reversedNum);

        }

*//Capitalize First Letter of Each Word in a String*

        function *capitalizeWords*() {

            letinputStr= *prompt*("Enter a sentence:");

            if (!inputStr) {

*alert*("Input cannot be empty!");

*return*;

            }

            letwords= *inputStr.split*(" ");

            letcapitalizedWords= *words.map*(*word* => *word.charAt*(0)*.toUpperCase*()+ *word.slice*(1));

            letresult= *capitalizedWords.join*(" ");

*alert*("Capitalized String: " + result);

        }

*//Find the Largest of Five Numbers*

        function *findLargest*() {

            letnumbers=[];

*for* (leti=1; i <= 5; i++) {

                letnum= *parseFloat*(*prompt*("Enter number "+i+":"));

                if (*isNaN*(num)) {

*alert*("Please enter valid numbers.");

*return*;

                }

*numbers.push*(num);

            }

            letlargest= *Math.max*(...numbers);

*alert*("The largest number is: " + largest);

        }

    </script>

</body>

</html>

***Task 6:***

<!DOCTYPE *html*>

<html *lang*="en">

<head>

    <meta *charset*="UTF-8">

    <meta *name*="viewport" *content*="width=device-width, initial-scale=1.0">

    <title>Student Grades</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            text-align: center;

            margin: 50px;

        }

        table {

            width: 50%;

            margin: auto;

            border-collapse: collapse;

        }

        th,td {

            border: 1px solid black;

            padding: 10px;

            text-align: center;

        }

        th {

            background-color: #f2f2f2;

        }

        button {

            padding: 10px 20px;

            font-size: 16px;

            margin-top: 20px;

            cursor: pointer;

        }

    </style>

</head>

<body>

    <h2>Student Grades Calculation</h2>

    <table>

        <tr>

            <th>Student Name</th>

            <th>Marks</th>

        </tr>

        <tr>

            <td>David</td>

            <td>80</td>

        </tr>

        <tr>

            <td>Vinoth</td>

            <td>77</td>

        </tr>

        <tr>

            <td>Divya</td>

            <td>88</td>

        </tr>

        <tr>

            <td>Ishitha</td>

            <td>95</td>

        </tr>

        <tr>

            <td>Thomas</td>

            <td>68</td>

        </tr>

    </table>

    <button *onclick*="*calculateGrade*()">Calculate Average & Grade</button>

    <h3 *id*="result"></h3>

    <script>

        function *calculateGrade*() {

            letmarks=[80,77,88,95,68];  *// Marks of students*

            lettotal= *marks.reduce*((*sum*, *mark*)=>sum+mark,0);

            letaverage=total/ *marks.length*;

            letgrade="";

            if (average < 60) {

                grade = "F";

            } else if (average < 70) {

                grade = "D";

            } else if (average < 80) {

                grade = "C";

            } else if (average < 90) {

                grade = "B";

            } else {

                grade = "A";

            }

*document.getElementById*("result")*.*innerHTML =

                `Average Marks: ${*average.toFixed*(2)} <br> Grade: ${grade}`;

        }

    </script>

</body>

</html>

***Task 7:***

<!DOCTYPE *html*>

<html *lang*="en">

<head>

    <meta *charset*="UTF-8">

    <meta *name*="viewport" *content*="width=device-width, initial-scale=1.0">

    <title>Star Pattern</title>

</head>

<body>

    <h2>Star Pattern using JavaScript</h2>

    <button *onclick*="*printPattern*()">Print Pattern</button>

    <pre *id*="pattern"></pre>

    <script>

        function *printPattern*() {

            letresult="";

*for* (leti=1; i <= 5; i++) {

*for* (letj=1; j <= i; j++) {

                    result += "\*";

                }

                result += "\n";  *// Move to the next line after each row*

            }

*document.getElementById*("pattern")*.*innerText = result;

        }

    </script>

</body>

</html>

***Task 8:***

<!DOCTYPE *html*>

<html *lang*="en">

<head>

    <meta *charset*="UTF-8">

    <meta *name*="viewport" *content*="width=device-width, initial-scale=1.0">

    <title>Sphere Volume Calculator</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            margin: 50px;

        }

        label {

            font-weight: bold;

        }

        input {

            margin-bottom: 10px;

            display: block;

            padding: 5px;

            width: 200px;

        }

        button {

            padding: 8px 15px;

            font-size: 14px;

            cursor: pointer;

        }

    </style>

</head>

<body>

    <h2>Calculate Sphere Volume</h2>

    <p>Input radius value and get the volume of a sphere.</p>

    <form *onsubmit*="*calculateVolume*(); *return* false;">

        <label *for*="radius">Radius</label>

        <input *type*="number" *id*="radius" *step*="any" *required*>

        <label *for*="volume">Volume</label>

        <input *type*="text" *id*="volume" *readonly*>

        <button *type*="submit">Calculate</button>

    </form>

    <script>

        function *calculateVolume*() {

            letradius= *document.getElementById*("radius")*.value*;

            if (radius <= 0 || *isNaN*(radius)) {

*alert*("Please enter a valid positive number for radius.");

*return*;

            }

            letvolume=(4/3)\* *Math.PI* \* *Math.pow*(radius,3);

*document.getElementById*("volume")*.*value = *volume.toFixed*(4);

        }

    </script>

</body>

</html>

***Task 9:***

<!DOCTYPE *html*>

<html *lang*="en">

<head>

    <meta *charset*="UTF-8">

    <meta *name*="viewport" *content*="width=device-width, initial-scale=1.0">

    <title>Simple Calculator</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            margin: 50px;

            text-align: center;

        }

        input {

            width: 100px;

            padding: 5px;

            margin: 10px;

        }

        button {

            padding: 8px 15px;

            margin: 5px;

            cursor: pointer;

        }

    </style>

</head>

<body>

    <h2>Simple Calculator</h2>

    <input *type*="number" *id*="num1" *placeholder*="Enter number 1">

    <input *type*="number" *id*="num2" *placeholder*="Enter number 2">

    <br>

    <button *onclick*="*calculate*('+')">+</button>

    <button *onclick*="*calculate*('-')">-</button>

    <button *onclick*="*calculate*('\*')">×</button>

    <button *onclick*="*calculate*('/')">÷</button>

    <h3>Result: <span *id*="result">0</span></h3>

    <script>

        function *calculate*(operator) {

            letnum1= *parseFloat*(*document.getElementById*("num1")*.value*);

            letnum2= *parseFloat*(*document.getElementById*("num2")*.value*);

            if (*isNaN*(num1) || *isNaN*(num2)) {

*alert*("Please enter valid numbers.");

*return*;

            }

            letresult;

            switch (operator) {

                case '+': result = num1 + num2; *break*;

                case '-': result = num1 - num2; *break*;

                case '\*': result = num1 \* num2; *break*;

                case '/':

                    if (num2 === 0) {

*alert*("Cannot divide by zero!");

*return*;

                    }

                    result = num1 / num2;

*break*;

                default: result = "Invalid Operation";

            }

*document.getElementById*("result")*.*textContent = result;

        }

    </script>

</body>

</html>

***Task 10:***

<!DOCTYPE *html*>

<html *lang*="en">

<head>

    <meta *charset*="UTF-8">

    <meta *name*="viewport" *content*="width=device-width, initial-scale=1.0">

    <title>Form Validation</title>

    <style>

        body { font-family: Arial, sans-serif; margin: 50px; }

        input { width: 250px; padding: 5px; margin-bottom: 10px; display: block; }

        button { padding: 8px 15px; cursor: pointer; }

    </style>

</head>

<body>

    <h2>Form Validation</h2>

    <form *onsubmit*="*return* *validateForm*()">

        <label>Name:</label>

        <input *type*="text" *id*="name">

        <label>Age:</label>

        <input *type*="text" *id*="age">

        <label>Phone Number:</label>

        <input *type*="text" *id*="phone">

        <label>Email:</label>

        <input *type*="text" *id*="email">

        <label>Password:</label>

        <input *type*="password" *id*="password">

        <label>Date (YYYY-MM-DD):</label>

        <input *type*="text" *id*="date">

        <button *type*="submit">Submit</button>

    </form>

    <script>

        function *validateForm*() {

            letname= *document.getElementById*("name")*.value*;

            letage= *document.getElementById*("age")*.value*;

            letphone= *document.getElementById*("phone")*.value*;

            letemail= *document.getElementById*("email")*.value*;

            letpassword= *document.getElementById*("password")*.value*;

            letdate= *document.getElementById*("date")*.value*;

            letnamePattern=/*^*[*A-Za-z* ]+*$*/;

            letagePattern=/*^*[*0-9*]+*$*/;

            letphonePattern=/*^*[*0-9*]{10}*$*/;

            letemailPattern=/*^*[*a-zA-Z0-9.\_%+-*]+*@*[*a-zA-Z0-9.-*]+*\.*[*a-zA-Z*]{2,}*$*/;

            letpasswordPattern=/*^*(?=*.*\*[*A-Z*])(?=*.*\**\d*)*.*{6,}*$*/;

            letdatePattern=/*^\d*{4}*-\d*{2}*-\d*{2}*$*/;

            if (!*namePattern.test*(name)) {

*alert*("Name should contain only letters.");

*return* false;

            }

            if (!*agePattern.test*(age)) {

*alert*("Age should be a number.");

*return* false;

            }

            if (!*phonePattern.test*(phone)) {

*alert*("Phone number should be exactly 10 digits.");

*return* false;

            }

            if (!*emailPattern.test*(email)) {

*alert*("Enter a valid email address.");

*return* false;

            }

            if (!*passwordPattern.test*(password)) {

*alert*("Password should be at least 6 characters, include 1 uppercase letter and 1 number.");

*return* false;

            }

            if (!*datePattern.test*(date)) {

*alert*("Enter a valid date in YYYY-MM-DD format.");

*return* false;

            }

*alert*("Form submitted successfully!");

*return* true;

        }

    </script>

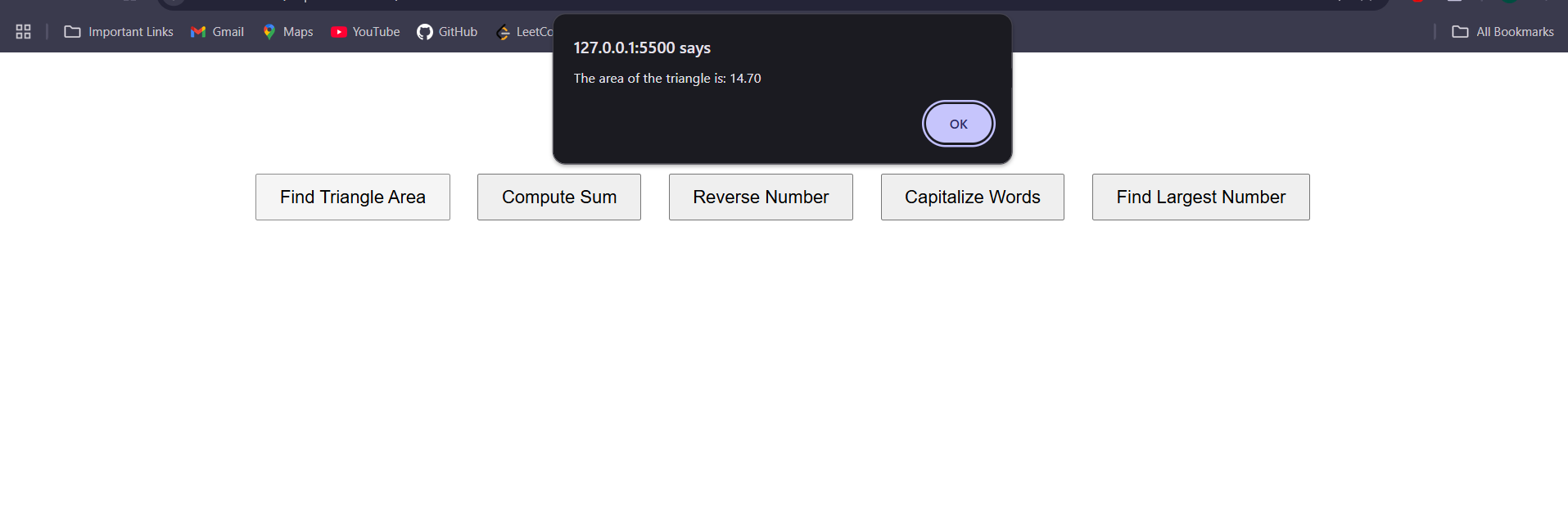
</body>

</html>

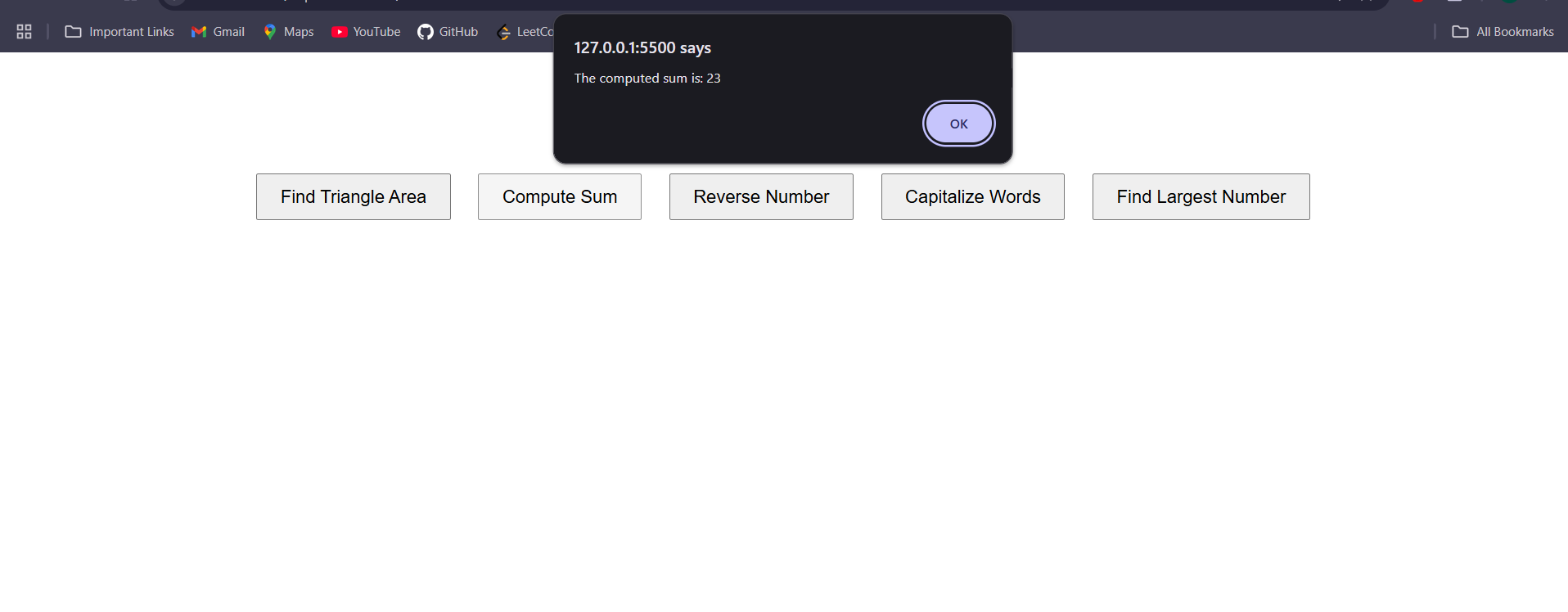
**B.2 Output**

*(Take screen shots of the output at run time and paste it here)*

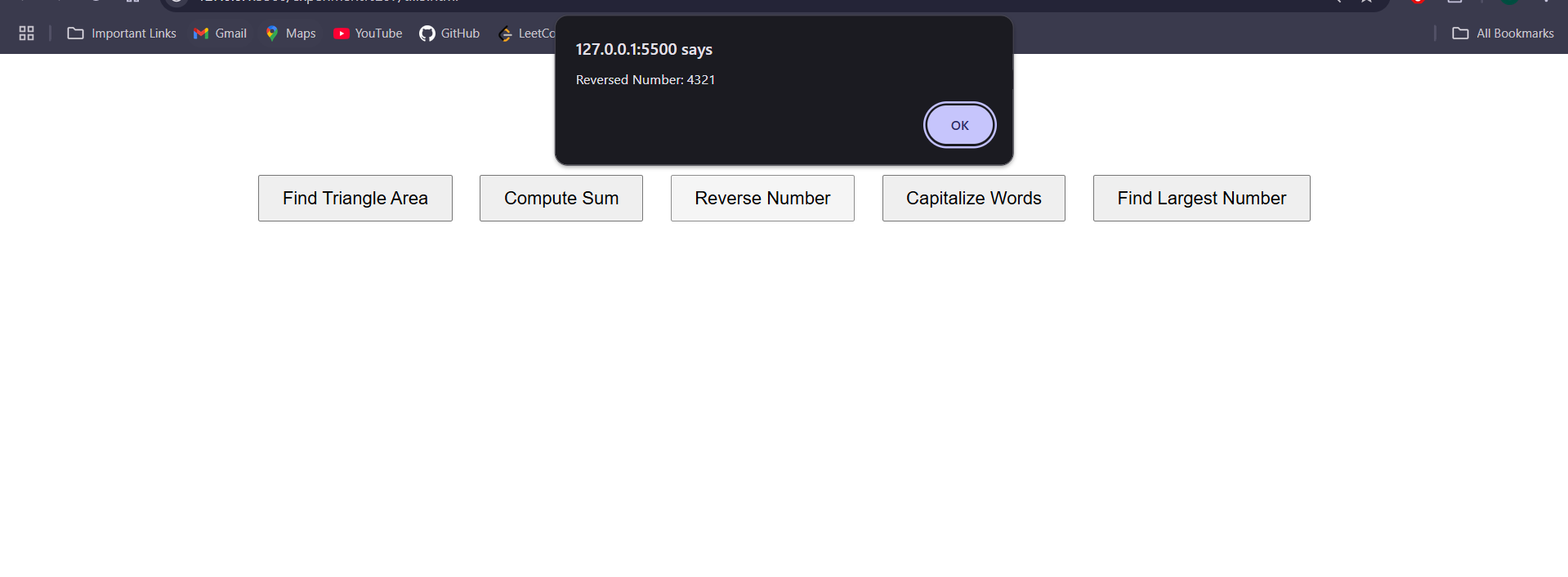
***Task 1:***

******

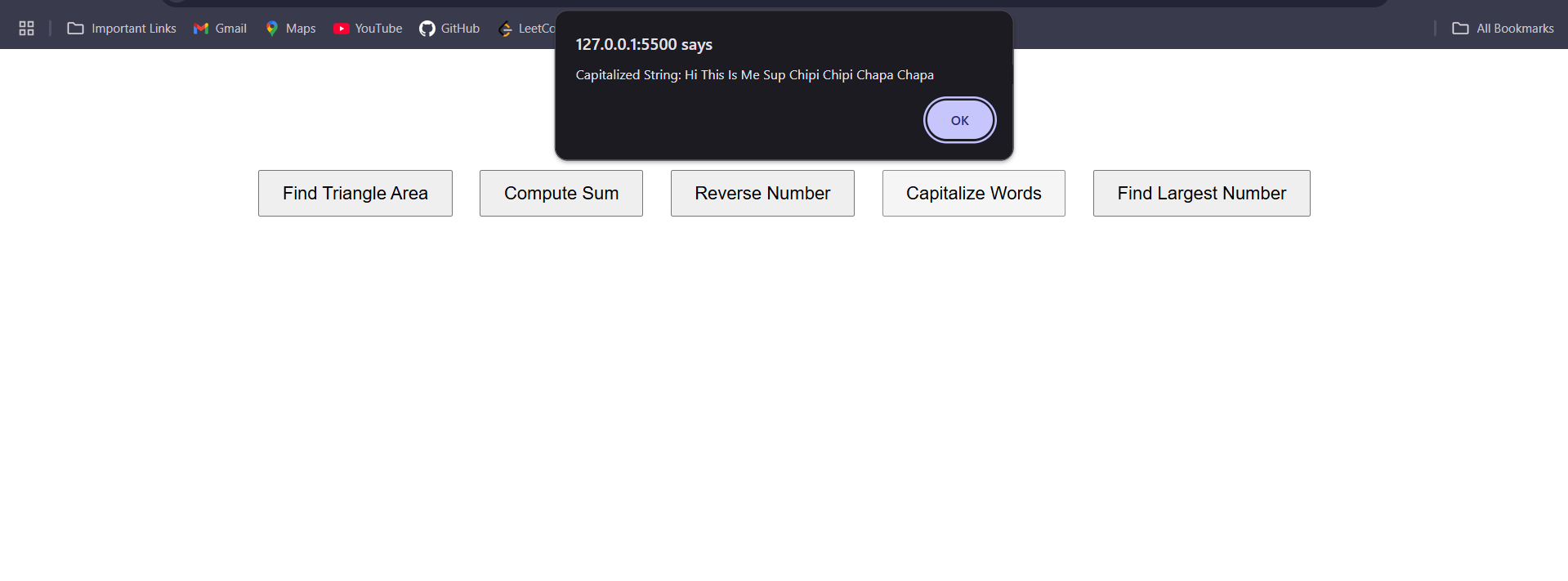
***Task 2:***

******

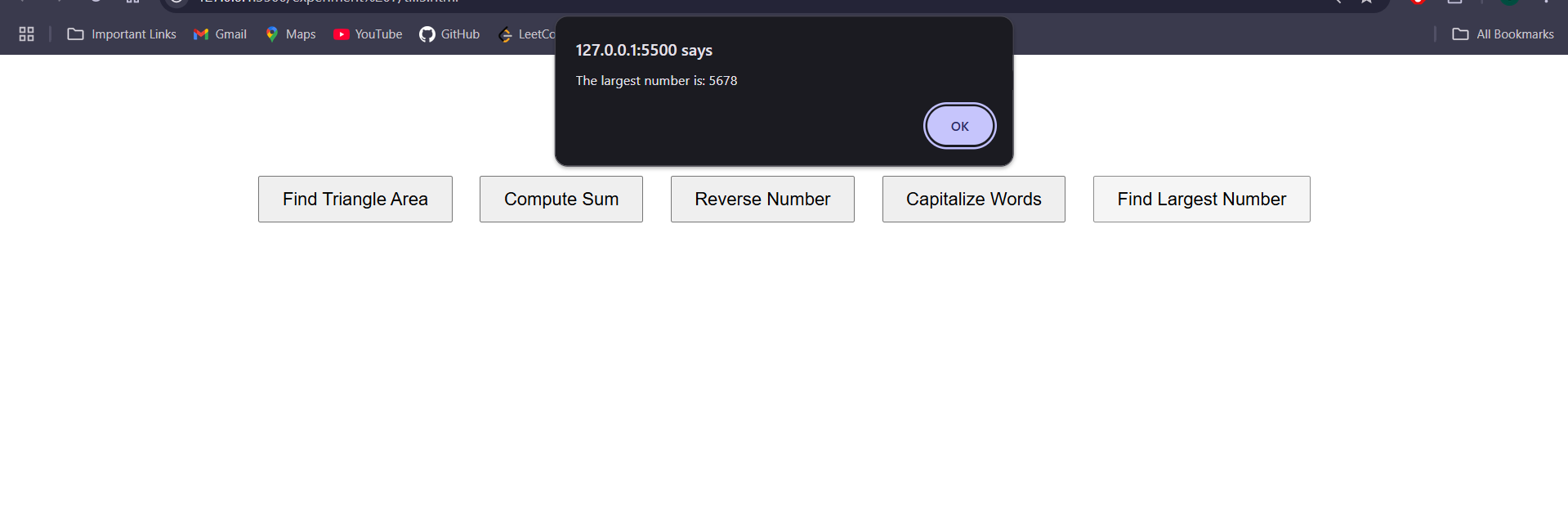
***Task 3:***

******

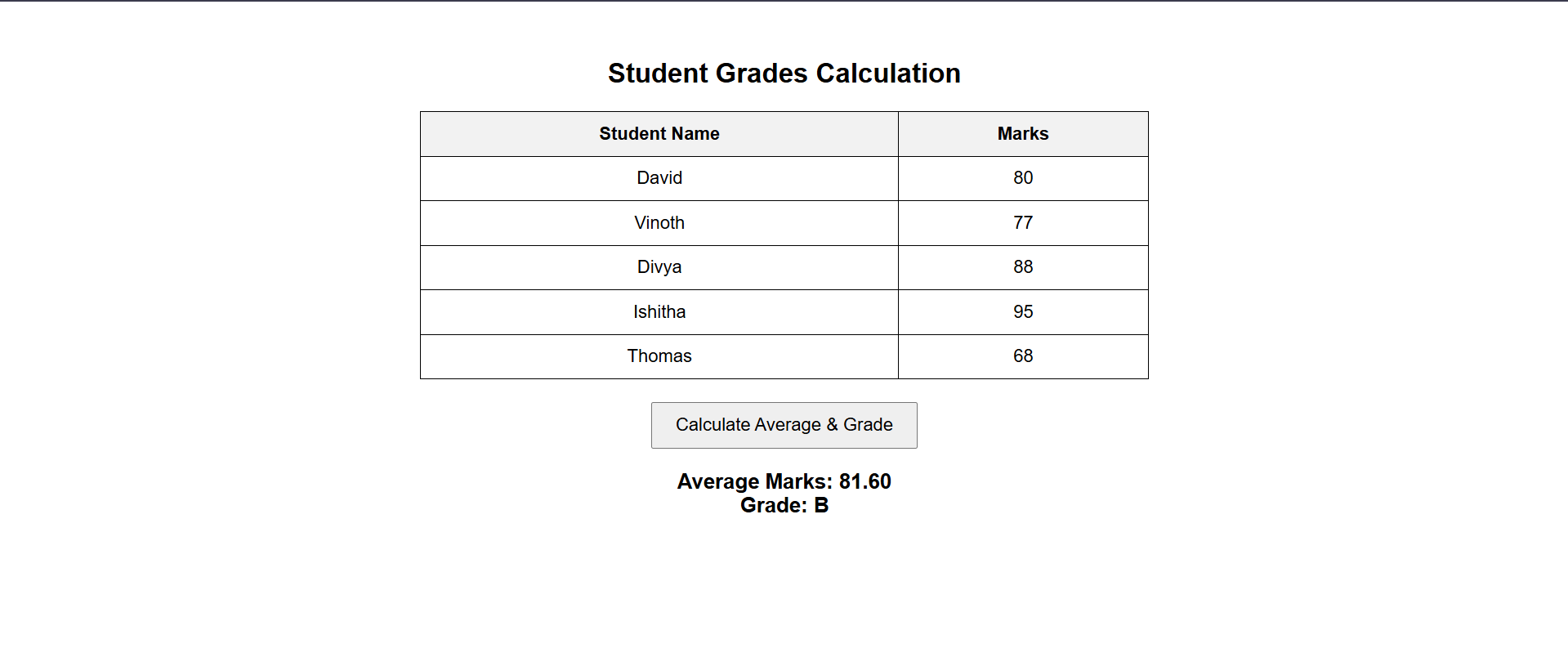
***Task 4:***

******

***Task 5:***

******

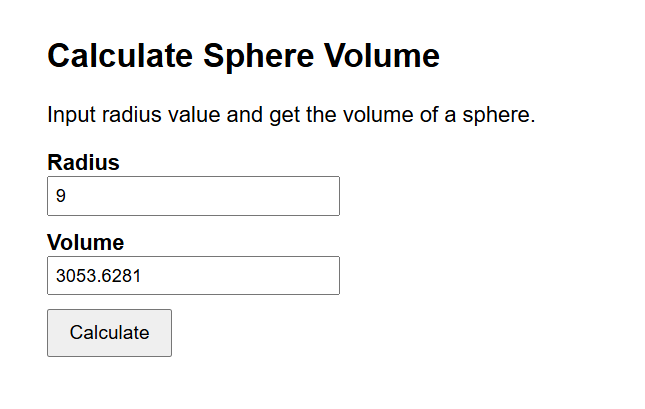
***Task 6:***

******

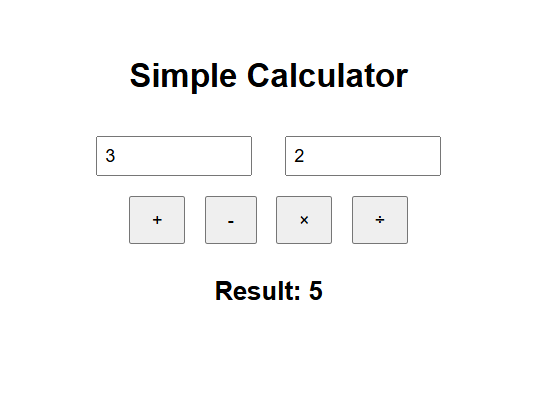
***Task 7:***

******

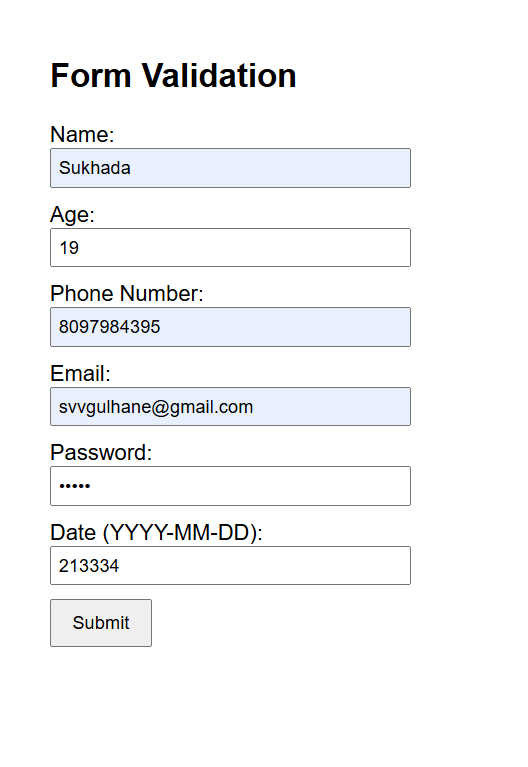
***Task 8:***

******

***Task 9:***

******

***Task 10:***

******

**B.3 Conclusion:**

*(Students must write the conclusion as per the attainment of individual outcome listed above)*

Implemented basic JavaScript operators, conditional statements, loops etc.

**B.3 Observations and Learning:**

*(Students must write their observations and learnings as per the attainment of individual outcome listed above)*

Implemented basic JavaScript operators, conditional statements, loops etc.