Instructions: Have to answer one question each from PART A and Part B with project demonstration

General Problems – Part A

1. a.Write a JavaScript function that accepts a string as a parameter and counts the number of vowels within the string.

```
<script>
count=0
    var a =prompt("Enter a string")
    a=a.toLowerCase()
    for(i=0;i<a.length;i++)
    {
      if(a[i]=='a' || a[i]=='e' || a[i]=='i' || a[i]=='o' || a[i]=='u')
      count++
    }
    document.write("No. of vowels: "+count)
</script>
```

b. Write a JavaScript program to count the number of words in a string.

```
<script>
    var a = prompt("Enter a string")
    var li = a.split(" ")
    document.write("No. of words in the string: " + li.length)
</script>
```

CO1, CO2

2. a. Write a JavaScript function to get the number of occurrences of each letter in a specified string.

```
<script>
    var str = prompt("Enter a string")
    var dict = {}
    for (i = 0; i < str.length; i++) {
        if (str[i] != ' ' && str[i] in dict)
            dict[str[i]] += 1
        else if (str[i] != ' ')
            dict[str[i]] = 1
    }
    for (key in dict)
        document.write(key + " : " + dict[key] + "<br>")
</script>
```

b. Write a JavaScript function that accepts a string as a parameter and find the longest word within the string

```
<script>
    var str = prompt("Enter a string")
    li = str.split(" ")
    max = li[0].length
```

```
    a = ""
    for (i = 0; i < li.length; i++) {
        if (li[i].length > max) {
            max = li[i].length
            a = li[i]
        }
    }
    document.write("Longest word is " + a + " : " + max)
</script>
```

3. Write a JavaScript code to handle multiple callback functions using JavaScript promises (use promiseobject.then (onfulfilled,onrejected)).

```
<script>
    var numtest = (res) => new Promise(function(resolve, reject) {
        if (res < 20)
            resolve("Number is less than 20" + "<br>")
        else
            reject(Error("Number is greater than 20" + "<br>"))
    })
    var num = prompt("Enter a number")
    numtest(num).then(
        function(data) {
            document.write(data)
        },
        function(error) {
            document.write(error)
        }
    ).then(() => {
        document.write("Multiple call back functions")
    }).finally(() => {
        alert("done")
    })
</script>
```

4. a. Write a JavaScript program to store values into a set, and to retrieve value from the set, to iterate over the set.

```
<script>
    var num = prompt("Enter no. of elements")
    var li = new Array()
    for (i = 0; i < num; i++)
        li[i] = parseInt(prompt("Enter element " + (i + 1)))
    var map = new Map()
    for (i = 0; i < li.length; i++)
        map.set(i, li[i])
```

```
    var ele = parseInt(prompt("Enter key"))
    console.log(map.has(ele))
    map.forEach(function(value, key) {
        console.log("key: " + key + " value: " + value)
    })
</script>
```

b. Write a JavaScript program to store values into a map, and to retrieve value from the map using key, to iterate over the map.

```
<script>
    var num = prompt("Enter no. of elements")
    var li = new Array()
    for (i = 0; i < num; i++)
        li[i] = parseInt(prompt("Enter element " + (i + 1)))
    var s = new Set()
    for (i = 0; i < li.length; i++) {
        s.add(li[i])
    }
    s.forEach(function(values) {
        console.log(values)
    })
</script>
```

CO2, CO4

5. a. Write a JavaScript code that returns a passed string with letters in alphabetical order. Use addEventListener() method.

```
<body>
    <label for="text">Enter a string:</label><br>
    <input type="text" name="" id="string"><br><br>
    <button id="button" onClick=sorting()>Click Me</button><br>
    <p id="data"></p>
</body>
<script>
    function sorting() {
        str = document.getElementById("string").value
        b = document.getElementById("button")
        b.addEventListener("click", () => {
            var res = str.split("").sort().join("")
            document.getElementById("data").innerHTML = res

        })
    }
</script>
```

b. Write Javascript code using functions to convert the text entered in textbox to lowercase if it's in uppercase, and vice versa on a button click.

```html
<body>
    <label for="">Enter a string:</label><br>
    <input type="text" id="string"><br>
    <button id="button" onclick=convert()>Click Me</button>
    <p id="data"></p>
</body>
<script>
    function convert() {
        res = ""
        var str = document.getElementById("string").value
        for (i = 0; i < str.length; i++) {

            if (str[i] >= 'A' && str[i] <= 'Z')
                res += str[i].toLowerCase()
            else if (str[i] >= 'a' && str[i] <= 'z')
                res += str[i].toUpperCase()
            else
                res += " "

        }
        document.getElementById("data").innerHTML = res

    }
</script>
```

CO2, CO4

6. a. Apply JavaScript Arrow function to reverse a given Number. Given Number = 12243; *Expected Output:* 34221

```html
<script>
    r = 0
    var num = prompt("Enter a number")
    while (num >= 1) {
        d = parseInt(num % 10)
        num = parseInt(num / 10)
        r = r * 10 + d
    }
    document.write(r)
</script>
```

b. Write Javascript arrow function to find factorial of a number.

```html
<script>
    fact = 1
    var num = prompt("Enter a number")
```

```javascript
    for (i = 1; i <= num; i++) {
        fact = fact * i
    }
    document.write(fact)
</script>
```

7. Write a JavaScript code to perform Jump Search for a given key and report success or failure. Prompt the user to enter the key and a list of numbers.

```javascript
<script>
    var n = prompt("Enter a no. of elements")
    var a = new Array()
    for (i = 0; i < n; i++)
        a[i] = prompt("Enter element " + (i + 1))
    var k = prompt("Enter key")

    function jumpSearch(a, n, x) {
        var step = Math.floor(Math.sqrt(n))
        prev = 0
        while (a[Math.min(step, n) - 1] < x) {
            prev = step
            step += step
            if (prev > n)
                return -1
        }
        while (a[prev] < x) {
            prev++
            if (prev == Math.min(step, n))
                return -1
        }
        if (a[prev] == x)
            return prev
        return -1

    }
    document.write(jumpSearch(a, n, k))
</script>
```

8. Write JavaScript code to encrypt the text using Caesar Cipher technique. Display the encrypted text. Prompt the user for input and the shift pattern.

```javascript
<script>
    var str = prompt("Enter text")
    var key = parseInt(prompt("Enter key"))
    res = ""
    for (i = 0; i < str.length; i++) {
```

```javascript
        var ascii = str[i].charCodeAt(0)
        document.write(ascii + "<br>")
        if (ascii >= 65 && ascii <= 90)
            res += String.fromCharCode((ascii + key - 65) % 26 + 65)
        else {

            res += String.fromCharCode((ascii + key - 97) % 26 + 97)
        }
    }
    document.write(res)
</script>
```

CO2, CO4

9. Write a JavaScript function.

      a. To capitalize the first letter of each word in a string.

```javascript
<script>
    var str = prompt("Enter the string")
    li = str.split(" ")
    for (i = 0; i < li.length; i++) {
        li[i] = li[i][0].toUpperCase() + li[i].slice(1)
    }
    document.write(li.join(" "))
```

      b. To split a string and convert it into an array of words.

```javascript
<script>
    var str = prompt("Enter a string")
    li = str.split(" ")
    document.write(li)
</script>
```

CO1, CO2

10. a. Write a JavaScript program to list the properties of a JavaScript object.

      Sample object:
      var student = {
      name : "C V Raman",
      Dept : "ISE",
      id : 058 };
      Sample Output: C V Raman ISE, 056

```javascript
<script>
    var n = prompt("Enter no. of key value pairs")
    d = {}
    for (i = 0; i < n; i++) {
        var key = prompt("Enter key " + (i + 1))
        var value = prompt("Enter value " + (i + 1))
        d[key] = value
    }
    document.write(Object.values(d).join(" "))
</script>
```

b. Write javascript code given a string, to reverse each word in the sentence.
   (Ex: Welcome to this Javascript Guide! should become emocleW ot siht tpircsavaJ !ediuG)

```html
<script>
    var str = prompt("Enter a string: ")
    li = str.split(" ")
    for (i = 0; i < li.length; i++) {
        li[i] = li[i].split("").reverse().join("")
    }
    document.write(li.join(" "))
</script>
```

                                                                                      CO1

Application based Problems – Part B

1. Show how map is different from object to store key value pairs with coding examples and prove Maps perform better than objects in most of the scenarios involving addition and removal of keys.

                                                                                 CO2, CO4

```html
<script>
    var num = prompt("Enter no. of elements")
    var li = new Array()
    for (i = 0; i < num; i++)
        li[i] = prompt("Enter element " + (i + 1))
    var map = new Map()
    var obj = {}

    for (i = 0; i < li.length; i++) {
        obj[i] = li[i]
        map.set(i, li[i])
    }
    console.log(obj)
    console.log(map)

    console.time('Object')
    var res = obj.hasOwnProperty(2)
    console.log(res)
    console.timeEnd('Object')

    console.time('Map')
    var res = map.has(2)
    console.log(res)
    console.timeEnd('Map')
</script>
```

2. Show how a set is different from an array to store the value with a coding example and prove Sets perform better than Arrays in most of the scenarios involving searching values present in it.

CO2, CO4

```
<script>
    var num = prompt("Enter no. of elements")
    var li = new Array()
    for (i = 0; i < num; i++)
        li[i] = prompt("Enter element " + (i + 1))
    var a = []
    var s = new Set()

    for (i = 0; i < li.length; i++) {
        a.push(li[i])
        s.add(li[i])
    }
    console.log(a)
    console.log(s)
    console.time('Array')
    res = a.indexOf("2")
    console.log(res)
    console.timeEnd('Array')

    console.time('Set')
    res = s.has("2")
    console.log(res)
    console.timeEnd('Set')
</script>
```

3. Write a Javascript program to Implement arithmetic operations using Javascript promise and DOM APIs. Display result for each operation synchronously using await () method. (Give delay in each promise object using settimeout() method).

```
<body>
    <label for="">Enter number 1:</label><br>
    <input type="text" name="number1" id="number1"><br>
    <label for="">Enter number 2:</label><br>
    <input type="text" name="number2" id="number2"><br>
    <button id="button" onClick=calc()>SUBMIT</button>
</body>
<script>
    let promise1 = (a, b) => new Promise(function(resolve, reject) {
        setTimeout(function() {
            resolve(a + b)
        }), 4000
    })
    let promise2 = (a, b) => new Promise(function(resolve, reject) {
```

```javascript
            setTimeout(function() {
                resolve(a - b)
            }), 4000
    })
    let promise3 = (a, b) => new Promise(function(resolve, reject) {
            setTimeout(function() {
                resolve(a * b)
            }), 4000
    })
    let promise4 = (a, b) => new Promise(function(resolve, reject) {
            setTimeout(function() {
                resolve(a / b)
            }), 4000
    })



    async function aop(a, b) {
        let result1 = await promise1(a, b)
        document.write("Addition of 2 numbers: " + result1 + "<br>")
        let result2 = await promise2(a, b)
        document.write(result2 + "<br>")
        let result3 = await promise3(a, b)
        document.write(result3 + "<br>")
        let result4 = await promise4(a, b)
        document.write(result4 + "<br>")
    }

    function calc() {
        var a = parseInt(document.getElementById("number1").value)
        var b = parseInt(document.getElementById("number2").value)
        aop(a, b)
    }
</script>
```

CO2, CO4

4. Write a Javascript program where user passes the location and a function is called which returns a promise, if the location passed is Paris Below is the output expected:
"Let's take a trip to Paris"
If the location is other than Paris, show the error message "Invalid Location"   **CO2, CO4**

```javascript
<script>
    var getTrip = (location) => new Promise(function(resolve, reject) {
        if (location === "paris")
```

```
            resolve("Lets go to paris")
        else
            reject(Error("Invalid location"))
    })
    var location = prompt("Enter location")
    getTrip(location).then(
        function(data) {
            document.write(data)
        },
        function(error) {
            document.write(error)
        }
    )
</script>
```

5. Write a JavaScript program to book a hotel only after booking a flight.
[Hint: To achieve this, the promise returned from the bookHotel function is resolved only after resolving the promise from bookFlight function.
If the promise gets rejected from bookflight then it won't execute the second function.]

CO2, CO4

```
<script>
    let bookFlight = new Promise(function(resolve, reject) {
        setTimeout(() => {
            book = false
            if (book)
                resolve("Flight is booked .Hotel booked")
            else
                resolve("Flight is not booked")
        }, 4000);
    })
    async function bookHotel() {
        res = await bookFlight
        document.write(res)


    }
    bookHotel()
</script>
```

6. Write an arrow function that will take one parameter weight in Kg. This arrow function will convert Kg to Lbs. Formula is kg*2.2
- If LBS is > 150, then the function should return "obese"
- If LBS is between 100 to 150, the function should return "you are ok"
- If LBS is < 100, then the function should return "underweight"   **CO2, CO4**

```
<script>
    var calc = (lbs) => {
        if (lbs < 100)
            document.write("Under weight")
        else if (lbs >= 100 && lbs <= 150)
            document.write("You are ok")
        else
            document.write("Obese")
    }
    var kg = parseInt(prompt("Enter kg"))
    var lbs = kg * 2.2
    calc(lbs)
</script>
```

7. In the Martian land faraway, a new virus has evolved and is attacking the individuals at a fast pace. The scientists have figured out the virus composition, V. The big task is to identify the people who are infected. The sample of N people is taken to check if they are POSITIVE or NEGATIVE. A report is generated which provides the current blood composition B of the person.

POSITIVE or NEGATIVE?

If the blood composition of the person is a subsequence of the virus composition V, then the person is identified as POSITIVE otherwise NEGATIVE.   **CO2, CO4**

```
<script>
    var v = prompt("Enter virus comp")
    var b = prompt("Enter blood comp")
    i = 0
    j = 0
    count = 0
    while (i < v.length && j < b.length) {
        if (v[i] == b[j]) {
            i++
            j++
            count++
        } else
            i++
    }
    if (count == b.length)
        document.write("POSITIVE")
    else
        document.write("NEGATIVE")
</script>
```

8. Write a Javascript code to validate the email id using regular expressions. email is a string consisting of 3 parts: username, @ symbol and domain. The first part of an email address is the username. @ Symbol fits in between the username and the domain of your email address. The domain consists of two parts:

the mail server and the top-level domain. The mail server is the server hosting the email account ("Gmail").
The top-level domain is the extension, such as .com, .net or .info.

CO1, CO2, CO4

```html
<script>
    var email = prompt("Enter email id")
    var regex = /^[a-zA-Z0-9.!#$%^&*{|}:'<>']+@[a-zA-Z0-9-]+(.?[a-zA-Z0-9]+)*$/
    if (email.match(regex))
        document.write("Valid email")
    else
        document.write("Invalid email")
</script>
```

9. Write a JavaScript program using Client-side web APIs to Get the latitude and longitude of the user's
position.   **CO1, CO2, CO4**

```html
<body>
    <p>Your location</p>
    <p id="latitude"></p>
    <p id="longitude"></p>
    <button id="button" onClick=loc()>GET MY LOCATION</button>
</body>
<script>
    function loc() {
        navigator.geolocation.getCurrentPosition(function(position) {
            var lat = position.coords.latitude
            var log = position.coords.longitude
            document.getElementById("latitude").innerHTML = lat.toFixed(2)
            document.getElementById("longitude").innerHTML = log.toFixed(2)
        })
    }
</script>
```

10. Write a JavaScript program to count the number of visitors to keep track of how often a website is
accessed and display the number of visitors at the bottom of the homepage.   **CO1, CO2, CO4**

```html
<body>
    <p>WEBSITE COUNTER</p>
    <p id="data"></p>
    <button id="button" onclick=reset()>RESET</button>
</body>
<script>
    var visitCount = localStorage.getItem("page-view")
    if (visitCount) {
        visitCount = Number(visitCount) + 1
```

```
        localStorage.setItem("page-view", visitCount)
    } else {
        visitCount = 1
        localStorage.setItem("page-view", visitCount)
    }
    document.getElementById("data").innerHTML = visitCount

    function reset() {
        visitCount = 1
        localStorage.setItem("page-view", visitCount)
        document.getElementById("data").innerHTML = visitCount
    }
</script>
```