

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.

//Easy to understand:

```
function vowel_count(str1)
{
  var vowel_list = 'aeiouAEIOU';
  var vcount = 0;

  for(var x = 0; x < str1.length ; x++)
  {
    if (vowel_list.indexOf(str1[x]) !== -1)
    {
      vcount += 1;
    }
  }
  return vcount;
}
x=prompt("Enter the string:");
console.log(vowel_count(x));
```

///or

```
// program to count the number of vowels in a string

// defining vowels
const vowels = ["a", "e", "i", "o", "u"]

function countVowel(str) {
  // initialize count
  let count = 0;

  // loop through string to test if each character is a vowel
  for (let letter of str.toLowerCase()) {
    if (vowels.includes(letter)) {
      count++;
    }
  }

  // return number of vowels
  return count
}

// take input
const string = prompt('Enter a string: ');
```

```
const result = countVowel(string);
```

///or

```
// program to count the number of vowels in a string
```

```
function countVowel(str) {  
  
    // find the count of vowels  
    const count = str.match(/[aeiou]/gi).length;  
  
    // return number of vowels  
    return count;  
}  
  
// take input  
const string = prompt('Enter a string: ');  
  
const result = countVowel(string);  
  
console.log(result);
```

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

```
x=prompt("Enter the string:");  
document.write(x.split(" ").length);
```

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

```
function Char_Counts(str1) {  
    var uchars = {};  
    str1.replace(/\S/g, function(l){uchars[l] = (isNaN(uchars[l]) ? 1 : uchars[l] + 1)});  
    return uchars;  
}  
console.log(Char_Counts("The quick brown fox jumps over the lazy dog"));
```

// or

```
let countCharacters = (string) => {  
    let count = 1;  
    string=string.toLowerCase();  
    var str1=string.split("").sort().join("");
```

```

for (let i = 0; i < str1.length; i++) {
  if (str1[i] === str1[i + 1]) {
    count++;
  } else {
    console.log(`${str1[i]} occur ${count} times`);
    //console.log(str1[i] + "occurs" + count + "times");
    count = 1;
  }
}
};
var x=prompt("Enter the str:");
countCharacters(x);

//countCharacters("the quick brown fox jumps over the lazy dog");

```

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

```

function longest(str){
str = str.split(" ")
return str.sort((a, b) => b.length - a.length)[0]
}
var x=prompt("Enter the string:");
document.write(longest(x));

```

CO1, CO2

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

```

let n=prompt("Enter the number")
let numTest=new Promise(function(resolve, reject){
  if(n>20)
    resolve("The number greater then 20")
  else
    reject("The number is less then 20")
})
numTest.then((res)=>{

  console.log(res)
}).then(()=>{
  console.log("Multiple function called");
}).finally(()=>{alert("Done")})

```

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

```
let event=new Set();
let e1={"fruit":"Apple","color":"red"}
let e2={"fruit":"Mango","color":"orange"}
let e3={"fruit":"Banana","color":"yellow"}
let e4={"fruit":"Pineapple","color":"yellow"}
let e5={"fruit":"Mango","color":"orange"}
let e6={"fruit":"Kiwi","color":"green"}
```

```
event.add(e1);
event.add(e1);
event.add(e2);
event.add(e3);
event.add(e4);
event.add(e5);
event.add(e6);
```

```
// for(let i of event)
// console.log(i);
event.forEach(function(val){
  console.log(val);
})
```

//or

```
var n = prompt("Enter the n0. of items in set :")

var x = new Set()

for(let i=0;i<n;i++)
{
  x.add(prompt("Enter element :"+i))
}

x.forEach(function(value){
  document.write(value + "<br>")
})
```

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.

```
//program to store the value into the map and retrieve the value from the map
let n=prompt("Enter the number of key value pair")
let x=new Map();
for(let i=0;i<n;i++){
    let temp=(prompt("Enter the value of the key "+(i+1)));
    x.set(i,temp)
}
x.forEach(function(value,key){
    console.log("key: "+ key+" "+"value: "+ value)
})
```

CO2, CO4

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

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <input type="string" id="s1" />
    <button id="btn">click me</button>
    <script>
        document.getElementById("btn").addEventListener("click", fun);
        function fun(){
            let x=document.getElementById("s1").value;
            let str=[]
            for(let i=0;i<x.length;i++)
                str.push(x[i])
            for(let i=0;i<str.length;i++){
                for(let j=i+1;j<str.length;j++){
                    if(str[i]>str[j]){
                        let temp=str[i];
                        str[i]=str[j];
                        str[j]=temp;
                    }
                }
            }
            let r=""
            for(let i=0;i<str.length;i++)r+=str[i];
            document.getElementById("demo").innerHTML=r;
        }
    </script>
</body>
</html>
```

```

    }
    </script>
    <p id="demo"></p>
</body>
</html>

```

//OR

```

<body>
  <input type="string" id="s1" />
  <button id="btn">click me</button>
  <script>
    document.getElementById("btn").addEventListener("click", fun);
    function fun(){
      let x=document.getElementById("s1").value;
      x = x.split("")
      x.sort()
      let r=""
      for(let i=0;i<x.length;i++)
        r+=x[i];
      document.getElementById("demo").innerHTML=r;
    }
  </script>
  <p id="demo"></p>
</body>

```

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.

```

<body>
  <input type="string" id="s1" />
  <button id="btn">click me</button>
  <script>
    swapcase = function swapcase(str) {
      return str.replace(/([a-z]+)|([A-Z]+)/g, function(match, chr) {
        return chr ? match.toUpperCase() : match.toLowerCase();
      });
    }
    document.getElementById("btn").addEventListener("click", fun);
    function fun(){
      let x=document.getElementById("s1").value;
      r=swapcase(x);
      document.getElementById("demo").innerHTML=r;
    }
  </script>

```

```

}
</script>
<p id="demo"></p>
</body>

```

CO2, CO4

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

```

let fun=(n)=>{
  let sum=0;
  while(n!=0){
    let p=n%10;
    sum=sum*10+p;
    n=parseInt(n/10);
  }
  return sum;
}
let x=prompt("Enter the number to find reversal number")
console.log(fun(x))

```

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

```

let fuct=(n)=>{
  let sum=1;
  while(n!=0){
    sum=sum*n;
    n=n-1;
  }
  return sum;
}
let x=prompt("Enter the number to find factorial number")
console.log(fuct(x))

```

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.

```

<script>
function jumpSearch(arr, x, n)
{

```

```

        let step = Math.sqrt(n);
        let prev = 0;
        while (arr[Math.min(step, n)-1] < x)
        {
            prev = step;
            step += Math.sqrt(n);
            if (prev >= n)
                return -1;
        }
        while (arr[prev] < x)
        {
            prev++;
            if (prev == Math.min(step, n))
                return -1;
        }
        if (arr[prev] == x)
            return prev;

        return -1;
    }
    let n=prompt("enter size:");
    let arr=[];
    for(let i=0;i<n;i++)
    {
        arr[i]=prompt(":")
    }
    let x=prompt("Enter the ele:");
    let index = jumpSearch(arr, x, n);
    document.write(`Number ${x} is at index ${index}`);
</script>

```

CO2, CO4

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.

CO2, CO4

```

let encrypt=(text,s)=>{
    let res=""
    for(let i=0;i<text.length;i++){
        let char=text[i];
        if(char.toUpperCase()){
            let ch=String.fromCharCode((char.charCodeAt(0)+s-65)%26+65);
            res+=ch;
        }
        else{

```



```

        let ch=String.fromCharCode((char.charCodeAt(0)+s-97)%26+97);
        res+=ch;
    }
}
return res;
}
let text="AttackAtOnce";
let s=1;
document.write("Text: "+text+"<br>");
document.write("Shift: "+s+"<br>");
document.write("Cipher: "+encrypt(text,s)+"<br>");

```

9. Write a JavaScript function.

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

```

let f1 = (s) => {
    // let s = prompt("Enter the string : ");
    document.write("<br>1.<br>")
    if (s[0] >= "a" && s[0] <= "z") {
        let r = s.charCodeAt(s[0]) - 97;
        document.write("After updating string is : " + String.fromCharCode(65 + r) + s.slice(1));
    }
    else
        document.write("After updating string is : " + s);
};
var x=prompt("Enter the string:");
f1(x)

```

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

```

let f4 = (s) => {
    // let s = prompt("Enter the string : ");
    let array = s.split(" ");
    document.write(s + " after splitting : " + array);
};
var x=prompt("Enter the string:");
f4(x);

```

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

```
var Student={  
  Name: "C V Raman ",  
  Dept: "ISE",  
  id : 058  
};  
document.write(Object.values(Student))
```

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)

```
function reverseWords(str) {  
  let reverseWordArr = str.split(" ").map(word => word.split("").reverse().join(""));  
  return reverseWordArr.join(" ");  
}  
console.log(reverseWords('The quick brown fox jumps over the lazy dog.'))
```

Part - B

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

```
let obj = {};
```

```
let map = new Map();
```

```
let userslist = ['john','stephen','ruth','sharon','malliga'];
```

```
for(let i=0;i<userslist.length;i++)  
{  
    obj[i] = userslist[i];  
    map.set(i,userslist[i]);  
}
```

```
let result1;  
console.log(obj);  
console.log(map);
```

```
console.time('Object');  
result1 = obj.hasOwnProperty(3);  
console.log(result1);  
console.timeEnd('Object');  
console.time('Map');  
let result2;  
result2 = map.has(2);  
console.log(result2);  
console.timeEnd('Map')
```

//or

```
let ob = {};  
let map = new Map();  
let res = ['kittu', 'krishna', 'krisna', 'kitty'];
```

```
for (i = 0; i < res.length; i++)  
{ ob[i] = res[i];  
map.set(i, ob[i]); }  
console.log(ob);  
console.log(map);  
console.time('ob');  
res = ob.hasOwnProperty('kitty');  
console.timeEnd('ob');  
console.time('Map');  
res = map.has('kitty');  
console.timeEnd('Map');
```

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

```
let arr = []  
let set = new Set();  
let userlistname = ['john','stephen','sharon','malliga','ruth'];  
  
for(let i=0;i<userlistname.length;i++)  
{  
    arr.push(userlistname[i]);  
    set.add(userlistname[i]);  
}  
console.log(arr);
```

```
console.log(set);
```

```
let result1,result2;
```

```
console.time('Array');
```

```
result1 = arr.indexOf('stephen') !== -1;
```

```
console.log(result1);
```

```
console.timeEnd('Array')
```

```
console.time('Set');
```

```
result2 = set.has('stephen');
```

```
console.log(result2);
```

```
console.timeEnd('Set')
```

//or

```
let arr=[];

let set=new Set();

let user=["hi",1,2,3,234,"amay"]

for(let i=0;i<user.length;i++){

    arr.push(user[i]);

    set.add(user[i]);

}
```

```
console.log(arr);
```

```
console.log(set);
```

```
let res;

console.time('Array')

res=arr.indexOf(3)==-1;

console.timeEnd('Array')


console.time('Set');

res=set.has(3);

console.timeEnd('Set');
```

3. Implement a JavaScript promise to perform arithmetic operations. Display result for each operation synchronously using await () method. (Give delay in each promise object using setTimeout() method)

```
const add = (n1,n2) => {

    return new Promise((resolve,reject) => {

        setTimeout(function(){

            resolve("Adding the two Numbers : " + (n1+n2));

            },3000)

        })

}


const sub = (n1,n2) => {
```

```
        return new Promise((resolve,reject) => {  
    setTimeout(function() {  
        resolve("Subtraction os the two Numbers : " + (n1 - n2));  
        },3000)  
    })  
}
```

```
const mul = (n1,n2) => {  
    return new Promise((resolve,reject) => {  
        setTimeout(() => {  
            resolve("Multiplication of the two Numbers : " +(n1*n2));  
            }, 3000);  
        })  
}
```

```
const div = (n1,n2) => {  
    return new Promise((resolve,reject) => {  
        setTimeout(() => {  
            resolve("Division of the two Numbers : " +(n1/n2));  
            }, 3000);  
        })  
}
```

```
let n1 = parseInt(prompt("Enter the first Number: "));
```

```
let n2 = parseInt(prompt("Enter the second Number: "));
```

```
add(n1,n2).then(function(res) {  
    console.log(res);  
})  
sub(n1,n2).then(function(res) {  
    console.log(res);  
})  
mul(n1,n2).then(function(res) {  
    console.log(res);  
})  
div(n1,n2).then(function(res) {  
    console.log(res);  
})
```

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"

```
let fun=(str)=>{  
    return new Promise((resolve,reject)=>{  
        let pattern = /Paris/i  
        let result = str.match(pattern)  
        if(result)  
        {  
            resolve("Let's take a trip to Paris")  
        }  
    })  
}
```



```
        else  
        reject("Invalid Location")  
    })  
}
```

```
let input = prompt("Enter the String : ")
```

```
fun(input).then(function(res){  
    document.write(res)  
}).catch(function(err){  
    document.write(err)  
})
```

//or

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.]

```
let bookflight = (string) => {  
    return new Promise((resolve,reject) => {  
        let pattern = /book-flight/i;
```

```
let result = string.match(pattern);

if(result)
{
  resolve("Your flight is Booked");
}
else
{
  reject("Flight not Booked");
}
})
}
```

```
let bookhotel = (string) => {
  return new Promise((resolve,reject) => {
    let pattern = /book-hotel/i;
    let result = string.match(pattern);

    if(result)
    {
      resolve("Your flight is Booked");
    }
    else
    {
      reject("Flight not Booked");
    }
  })
}
```

```
    }  
  })  
}
```

```
let string = prompt("Want to book a flight enter book-flight");  
bookflight(string).then(function(res){  
    alert(res);  
})  
  
let string1 = prompt("Want to book a hotel enter book-hotel");  
bookhotel(string1).then(function(res){  
    alert(res)  
}).catch(function(err){  
    alert(res);  
})
```

//or

```
let flight=(str)=>new Promise((resolve, reject)=>{  
    if(str=='book-flight' || str=='bookflight')  
        resolve("flight booked")  
    else  
        reject("flight blocked")  
})  
  
let hotel=(str)=>new Promise((resolve, reject)=>{  
    if(str=='book-hotel' || str=='hotel')  
        resolve("hotel booked")
```

```

    else

    reject("hotel blocked")

  })

let str1=prompt("\nEnter the book-flight if u want ")

flight(str1).then((val)=>{alert(val);

let str2=prompt("\nEnter the book-hotel if u want
");hotel(str2).then((val)=>alert(val))}.catch((val)=>alert(val))

```

6. Write an arrow function that will take one parameter weight in Kg. This arrow function will convert Kg to Lbs. Formula is $kg \times 2.2$

```

.
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"

```

```

let check = (kg) => {

    let lbs = 2.2 * kg;

    if (lbs < 100)

        return "underweight";

    else if (lbs >= 100 && lbs <= 150)

        return "you are ok";

    else

        return "obese";

}

let kg = parseInt(prompt("Enter the Weight in kg :"));

```

```
document.write("The person with " + kg + "kg weight is : " + check(kg));
```

//or

```
let fun=(n)=>(n*2.2)>150?'obese':(n*2.2)<150 && (n*2.2)>100?'you are ok':'underweight'  
console.log(fun(56))
```

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.

```
var v = prompt("Enter virus composition");
```

```
var b = prompt("Enter blood composition");
```

```
var i = 0, j = 0;
```

```
var 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");

```

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.

```

function valid_email(str)

{

var mailformat = /^\\w+([\\.-]?\\w+)*@\\w+([\\.-]?\\w+)*\\.\\w{2,4}+$/;

if(mailformat.test(str))

{

console.log("Valid email address!");

}

else

{

console.log("You have entered an invalid email address!");

}

}

valid_email('me-info@example.info');

```

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

```
<body>

  <p>

    Your location is <span id="latitude">0.00</span>°

    latitude by <span id="longitude">0.00</span>° longitude.

  </p>

  <button id="get-location">

    Get My Location

  </button>


  <script>

    let button = document.getElementById("get-location");

let latText = document.getElementById("latitude");
let longText = document.getElementById("longitude");


    button.addEventListener("click", function() {

      navigator.geolocation.getCurrentPosition(function(position) {

        let lat = position.coords.latitude;

        let long = position.coords.longitude;


        latText.innerText = lat.toFixed(2);

        longText.innerText = long.toFixed(2);

      });

    });
```

```
});  
  
</script>  
  
</body>
```

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.

```
<body>  
  
  <div>Website visit count:</div>  
  
  <div class="website-counter"></div>  
  
  <button id="reset">Reset</button>  
  
  <script>  
  
    var counterContainer = document.querySelector(".website-counter");  
  
var resetButton = document.querySelector("#reset");  
  
var visitCount = localStorage.getItem("page_view");  
  
  
    // Check if page_view entry is present  
    if (visitCount) {  
  
      visitCount = Number(visitCount) + 1;  
  
      localStorage.setItem("page_view", visitCount);  
  
    } else {  
  
      visitCount = 1;  
  
      localStorage.setItem("page_view", 1);  
  
    }  
  
    counterContainer.innerHTML = visitCount;
```



```
// Adding onClick event listener  
resetButton.addEventListener("click", () => {  
    visitCount = 1;  
    localStorage.setItem("page_view", 1);  
    counterContainer.innerHTML = visitCount;  
});  
  
</script>  
  
</body>
```