**Copy by value a composite datatype:**

**Array:**

let arr1 = [1,2,3,4,5];

console.log(arr1); // **it will print 1,2,3,4,5**

let arr2 = arr1.slice(); // **slice function will copy the values from arr1. If any changes made to the arr2** it will not reflect to arr1

console.log(arr2); // **it will print 1,2,3,4,5**

arr2[0]=6;

console.log(arr1); // **it will result 1,2,3,4,5**

console.log(arr2); // **it will result 6,2,3,4,5**

**Objects:**

let obj1 = {name:'Jeeva', age:22, city:'Coimbatore'};

let obj2 = Object.assign({},obj1); //**it helps in cloning the object so that if we do any updates on second obj it will not reflect to obj1**

console.log(obj1);

obj1.name='mark';

obj1.Phone=98457;

console.log(obj2);

obj2.name='Louis';

console.log(obj2);

console.log(obj1);

**Difference between copy by value and copy by reference:**

**Copy by Value:**

* It will copy only the value of variable not the reference
* So when we perform any changes then it will not reflect to the parent variable
* It can be performed only on primitive data types

**Copy by reference:**

* It will copy the value along with the reference(i.e memory)
* So when we perform any updates or changes to the child variable it will reflect to the parent variable
* It can be performed only on composite data types(array and objects)

**Question 1:**

**HTML code:**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

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

    <title>Document</title>

</head>

<body>

    <script src='script.js'></script>

    <h1>API Demo</h1>

</body>

</html>

**JS code:**

*var* req = new *XMLHttpRequest*();

req.open('GET','https://restcountries.eu/rest/v2/all',true);

req.send();

req.onload =*function*(){

*var* data = JSON.parse(this.response);

    console.log(data);

*let* i=0;

    for(i=0;i<data.length;i++)

    {

        console.log(data[i].name);

    }

};

**Problems with JSON objects:**

# Problem 0 : Part B (15 mins):

## Iterating with JSON object’s Values

Above is some information about my car. As you can see, I am not the best driver.  
I have caused a few accidents.  
Please update this driving record so that I can feel better about my driving skills.

**Answer:**

var myCar = {

make: 'Bugatti',

model: 'Bugatti La Voiture Noire',

year: 2019,

accidents: [

{

date: '3/15/2019',

damage\_points: '5000',

atFaultForAccident: true

},

{

date: '7/4/2022',

damage\_points: '2200',

atFaultForAccident: true

},

{

date: '6/22/2021',

damage\_points: '7900',

atFaultForAccident: true

}

]

}

let i = 0;

for(i in myCar.accidents)

{

// console.log(myCar.accidents[i])

myCar.accidents[i].atFaultForAccident=false;

console.log(myCar.accidents[i].atFaultForAccident);

console.log(myCar.accidents[i].date);

}var myCar = {

make: 'Bugatti',

model: 'Bugatti La Voiture Noire',

year: 2019,

accidents: [

{

date: '3/15/2019',

damage\_points: '5000',

atFaultForAccident: true

},

{

date: '7/4/2022',

damage\_points: '2200',

atFaultForAccident: true

},

{

date: '6/22/2021',

damage\_points: '7900',

atFaultForAccident: true

}

]

}

let i = 0;

for(i in myCar.accidents)

{

// console.log(myCar.accidents[i])

myCar.accidents[i].atFaultForAccident=false;

console.log(myCar.accidents[i].atFaultForAccident);

console.log(myCar.accidents[i].date);

}

# Problem 0 : Part A (15 mins):

## Playing with JSON object’s Values:

Fluffy sorry, Fluffyy is my fav cat and it has 2 catFriends  
Write a code to get the below details of Fluffyy so that  
I can take him to vet.

**Answer:**

var cat = {

name: 'Fluffy',

activities: ['play', 'eat cat food'],

catFriends: [

{

name: 'bar',

activities: ['be grumpy', 'eat bread omblet'],

weight: 8,

furcolor: 'white'

},

{

name: 'foo',

activities: ['sleep', 'pre-sleep naps'],

weight: 3

}

]

}

// Adding height and weight to Fluffy

cat.weight=6;

cat.height=45;

//Updating cat name to fluffyy

cat.name='Fluffyy';

//activities of fluffyy's catFriends

let i=0,totalWeight=0, sum=0, j=0;

for(i in cat.catFriends)

{

//console.log(i);

totalWeight += cat.catFriends[i].weight;

console.log('Activities of catFriends =' + cat.catFriends[i].activities);

console.log('friends name = '+ cat.catFriends[i].name); // fluffyy's friends name

for(j in cat.catFriends[i].activities) //// calculating total activities of all catFriends

{

sum++;

}

}

console.log("totalWeight of cat friends = " + totalWeight); // totalWeight of cat friends

for(j in cat.activities) //// calculating total activities of all catFriends

{

sum++;

}

console.log('Total activities of all cat :' +sum);

// adding activities to cat friends

for(i in cat.catFriends)

{

for(j in cat.catFriends[i].activities)

{

//console.log(j);

}

cat.catFriends[i].activities[++j]='Naughty';

cat.catFriends[i].activities[++j]='Beauty';

console.log(cat.catFriends[i]);

}

//updating fur color of bar

cat.catFriends[0].furcolor = 'Black';

console.log(cat);

# ****Problem 1 (5 mins):****

## ****Parsing an JSON object’s Values:****

Write a function called “printAllValues” which returns an newArray of all the input object’s values.

**Answer:**

# var obj = {name : 'RajiniKanth', age : 33, hasPets : false};

# let arr=[];

# arr=printAllValues(obj,arr);

# console.log(arr);

# function printAllValues(obj,arr) {

# let i =0;

# for( i in obj)

# {

# //console.log(obj[i]);

# arr.push(obj[i]);

# }

# return arr;

# }Problem 2(5 mins) :

## Parsing an JSON object’s Keys:

Write a function called “printAllKeys” which returns an newArray of all the input object’s keys.

**Answer:**

var obj = {name : 'RajiniKanth', age : 33, hasPets : false};

let arr=[];

arr=printAllKeys(obj, arr);

console.log(arr);

function printAllKeys(obj,arr) {

let i =0;

for( i in obj)

{

//console.log(i);

arr.push(i);

}

return arr;

}

# Problem 3( 7–9 mins):

## Parsing an JSON object and convert it to a list:

Write a function called “convertObjectToList” which converts an object literal into an array of arrays.

**Solution:**

var obj = {name: 'ISRO', age: 35, role: 'Scientist'};

let arr=[];

arr = convertObjectToList(obj, arr);

console.log(arr);

function convertObjectToList(obj, arr)

{

let arr1 =[], i=0, j=0;

for(i in obj)

{

arr1.push(i);

arr1.push(obj[i]);

arr.push(arr1);

arr1=[];

}

// arr.push(arr1);

//console.log(arr);

return arr;

}

# Problem 4( 5 mins):

## Parsing a list and transform the first and last elements of it:

Write a function ‘transformFirstAndLast’ that takes in an array, and returns an object with:  
1) the first element of the array as the object’s key, and  
2) the last element of the array as that key’s value.

**Solution:**

var arr = ['GUVI', 'I', 'am', 'Geek'];

/\*var object = {

GUVI : “Geek”

}\*/

let obj={};

obj=transformFirstAndLast(arr,obj);

console.log("var obj = " , obj);

function transformFirstAndLast(arr, obj)

{

obj[arr[0]]=arr[arr.length-1];

//console.log(obj);

return obj;

}

# Problem 5 ( 7 -9 mins):

## Parsing a list of lists and convert into a JSON object:

Write a function “fromListToObject” which takes in an array of arrays, and returns an object with each pair of elements in the array as a key-value pair.

**Solution:**

var arr = [['make', 'Ford'], ['model', 'Mustang'], ['year', 1964]];

let obj ={};

obj=fromListToObject(arr,obj);

console.log('var obj = ',obj);

function fromListToObject(arr,obj)

{

let i=0, j=0;

for(i=0;i<arr.length;i++)

{

for(j=0;j<arr[i].length;j+=2)

{

obj[arr[i][j]]=arr[i][j+1];

}

}

return obj;

}