Training Schedule

Course Name: JavaScript

Session 1 :Introduction to JavaScript
Duration: 2hr

- What is JavaScript ?
- Different ways of writing JavaScript
  (Inline JavaScript/ Internal JavaScript/ External JavaScript)
- Different types of JavaScript
  (Client-side JavaScript, Server-side JavaScript, Mobile JavaScript, Desktop JavaScript, Game Development)
- JavaScript Data types (Primitive and non-primitive)
- **Primitive data types** : string, number, boolean, undefined, null, BigInt.
- **Non-primitive data types** : arrays and objects.
- Console in Google Chrome (how to use it?, why should we use it?)
- console.log()
- document.write()
- alert()
- Declaring a variable using var
- Declaring string, number, boolean, BigInt(“”)
- prompt()

Session 2 : Operators
Duration: 2hr

- **Mathematical Operators**
  - Addition (+)
  - Subtraction (-)
  - Multiplication (*)
  - Division (/)
  - Exponential (**)
  - Modulus Remainder (%)
  - Increment (++)
  - Decrement (--)

- **Assignment Operator**
  - +=
  - -=
  - /=
  - =
  - *=
  - **=

- **Comparison Operator**
  - == Equal to
  - === equal to and compare the type to
  - != not equal to
  - !== type and value not equal to
  - greater than
  - < less than
  - >= greater than equal to
  - <= less than equal to
  - ? ternary operator

- **Logical Operator**
  - && and operator
  - || or operator
  - ! not operator

- **Math methods**
  - Math.random()
  - Math.floor()
  - Math.sqrt()
  - Math.min(23,88,01)
  - Math.max(839,347,99,2)
  - Math.pow(x,y) x raise to y

NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE:** Check if the value entered through prompt is even number or not
- **EXERCISE:** Write a JavaScript function called "convertFeetToInches" that takes a number of feet as a parameter and converts it to inches. Use the multiplication operator (*) to perform the conversion. The function should return the converted value in inches.
- **EXERCISE:** Write a JavaScript expression to calculate the average of three numbers, a, b, and c.
- **EXERCISE:** Create a JavaScript function that takes two parameters, num1 and num2, and returns the larger of the two numbers.

Session 3: String methods and DOM
Duration: 2hr

- **String Methods**
  - Text.length;
  - text.replace("to be replaced", "replaced with")
  - text.toUpperCase();
  - text.toLowerCase();
  - text.concat("Add this");
  - text.trim();
  - text.indexOf("search");
  - text.lastIndexOf("search");
  - text.indexOf("search", 3);
  - text.search("search");
  - String Concatenation
  - text.slice(2,5);
  - .match()
- Number()
- parseInt()
- IsNaN()
- toString()
- What is DOM?
- Why do we use DOM?
- DOM Elements
- Accessing Elements
  - document.getElementById()
  - document.getElementsByClassName()
  - document.getElementsByTagName()
- Modifying and accessing content
  - .innerHTML
  - .value
- Modifying attribute
  - .style
  - .src
  - .setAttribute("attributeName", "attributevalue")
  - .getattribute("attributeName")

- Declaring a function()
- Calling a function()
- Onclick event
- Function with parameter

NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE :** Write a code to calculate the area and circumference of a circle, where radius will be fetched from the input field in HTML and display the result in HTML . (Use function, .value, .innerHTML, etc.)
- **EXERCISE :** Change the color of a div on click

- **Assignment :** Make a simple calculator as shown below.

  Instructions:
  In the calculator, when clicked on Addition, Substraction, Multiplication, Division button, etc. only then the following result will be displayed. When clicked on the Reset button, the input field becomes empty and the Result box will be reset too.

2

3

Addition

Subtraction

Multiplication

Division

Exponential

Remainder

Reset

Result:
2 + 3 = 5
2 - 3 = -1
2 x 3 = 6
2 ÷ 3 = 0.6666666666666666
$2^3 = 8$
Remainder of 2 ÷ 3 = 2

Session 4 : Conditional Statement
Duration: 2hr

- If…else Condition
- If…else if…else Condition

NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE :** Check whether the number is even or odd
- **EXERCISE :** Check whether input is a number or not
- **EXERCISE :** Find the largest of the 2 numbers
- **EXERCISE :** Find the largest of the 3 numbers
- **EXERCISE :** Check if a triangle is equilateral, scalene, or isosceles
- **EXERCISE :** Check if a year is a leap year or not

NOTE : Give all the Exercise Problems in the next Session to Students as Assignment and solve all the problems students have doubt on in the next session.

Session 5 : Conditional Statement Practice
Duration: 2hr

- **EXERCISE :** Grade Finder
  Create a function to calculate the grade of the students (get student name and marks from the user)
    - "S grade" if marks is between 90 and 100
    - "A grade" if marks is between 80 and 90
    - "B grade" if marks is between 70 and 80
    - "C grade" if marks is between 60 and 70
    - "D grade" if marks is between 50 and 60
    - "E grade" if marks is between 40 and 50
    - "F grade" if marks is between 0 and 40
    - Else display invalid marks

- **EXERCISE:** Find number of days in a given month and year
    - If month is outside the range of 1 and 12 print "Invalid month"
    - If month is equal to 2 i.e, February print "29 days " if it is leap year else print "28 days"
    - Else if month is equal to 4, 6, 9, 11 print "30 days"
    - Else print "31 days"

- **EXERCISE:** BMI Calculator
  Bmi = weight(kg) / $(height(m))^2$
  BMI Categories:
  Underweight = <18.5
  Normal weight = 18.5-24.9
  Overweight = 25- 29.9
  Obesity = BMI of 30 or greater

- **EXERCISE:** Write a program that asks the user to enter a length in centimeters. If the user enters a negative length, the program should tell that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. (1 inch = 2.54 cm)

- **EXERCISE:** Ask the user to enter a temperature in celsius. The program should print a message based on the temperature
    - If the temperature is less than -273.15, print that the temperature is invalid because it is below absolute zero.
    - If it is exactly -273.15, print that the temperature is absolute 0.
    - If the temperature is between -273.15 and 0, print that the temperature is below freezing.
    - If it is 0, print that the temperature is at the freezing point.
    - If it is between 0 and 100, print that the temperature is in the normal range.
    - If it is 100, print that the temperature is at the boiling point.
    - If it is above 100, print that the temperature is above the boiling point.

- **Assignment:** Make **Dice Game 1** using (if..else Logic)as shown in the video Dice Game Video

  Instructions: This game contains 2 sections

  Section 1: Has 2 input box and a Lets Go button, when user enters the player names and **clicks the Let's Go button**, the Section 1 disappears (using display: none) and Section 2 appears (using display: flex, originally Section 2 is not visible)

  Section 2 : Has a scoreboard, images of the 2 dice and Roll and Reset button.
  When **Roll button is Clicked**,
    - Generate 2 random numbers for player 1 and player 2 in the range of 1-6 (for face of a dice) using Math.random and Math.floor
    - Based on the random number change the face of the dice image for player 1 and player 2 changes (ex. Random number for player 1 is 4, then the image for player should be a dice with face 4)
    - The player with the greatest face value (random number) of dice wins the round and the result is displayed in the scoreboard (if..else Logic is used here)

  When the **Reset button is Clicked**,
    - The Score on the scoreboard is reseted
    - All the dice image changes to a dice with face 1

Session 6 : Arrays and Objects

Duration: 2hr

- Declaring an array
- Accessing an array
- Array Methods
    - .toString()
    - .join("*")
    - pop()
    - push()
    - shift()
    - unshift()
    - concat()
    - splice(2,0,"Lemon", "Kiwi")
    - splice(0,1)
    - sort()
    - reverse()
- Declaring an Objects
- Accessing an Objects
- Declaring and Accessing
    - Array inside Array
    - Object inside Object
    - Array inside object
    - Object inside array

Session 7 : Loops
Duration: 2hr

- While loop
- Do..while loop
- For loop

NOTE : All the following problems are for while and for loop
NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE:** Write a JavaScript program which iterates the integers from 1 to 100. But for multiples of three print "Fizz" instead of the number and for the multiples of five print "Buzz". For numbers which are multiples of both three and five print "FizzBuzz".
- **EXERCISE:** Write a JavaScript program to sum the multiples of 3 and 5 under 1000.
- **EXERCISE:** Write a JavaScript code to calculate a sum of numbers where we get numbers using prompt accept numbers until a negative number is entered

NOTE : Give all the Exercise Problems in the next Session to Students as Assignment and solve all the problems students have doubt on in the next session.

Session 8 : Loops Practice
Duration: 2hr

- **EXERCISE:** Write a JavaScript code to find the no of digits in a number
- **EXERCISE:** Write a JavaScript code for calculating the sum of all digits for the input (eg, input= 344 result should be 11)
- **EXERCISE:** Write a JavaScript program to find the armstrong numbers of 3 digits. Note : An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since 3**3 + 7**3 + 1**3 = 371.
- **EXERCISE:** Write a JavaScript code to check if a number is a harshad number or not (21/2+1 = 7 , 21 is a harshad number)
- **EXERCISE:** Write a JavaScript code to print Even numbers in given array
- **EXERCISE:** Write a JavaScript code for a multiplication table.
- **EXERCISE:** Write a JavaScript code to collect the elements of array which are string
- **EXERCISE:** Write a JavaScript code to delete all occurrences of elements in a given array(Function `deleteElement()` deletes all occurrences of element from the given array.)
    - var arr = [23,56,4,78,5,63,45,210,56];
    - arr = deleteElement(arr, 56)
    - console.log(arr); //[23, 4, 78, 5, 63, 45, 210]

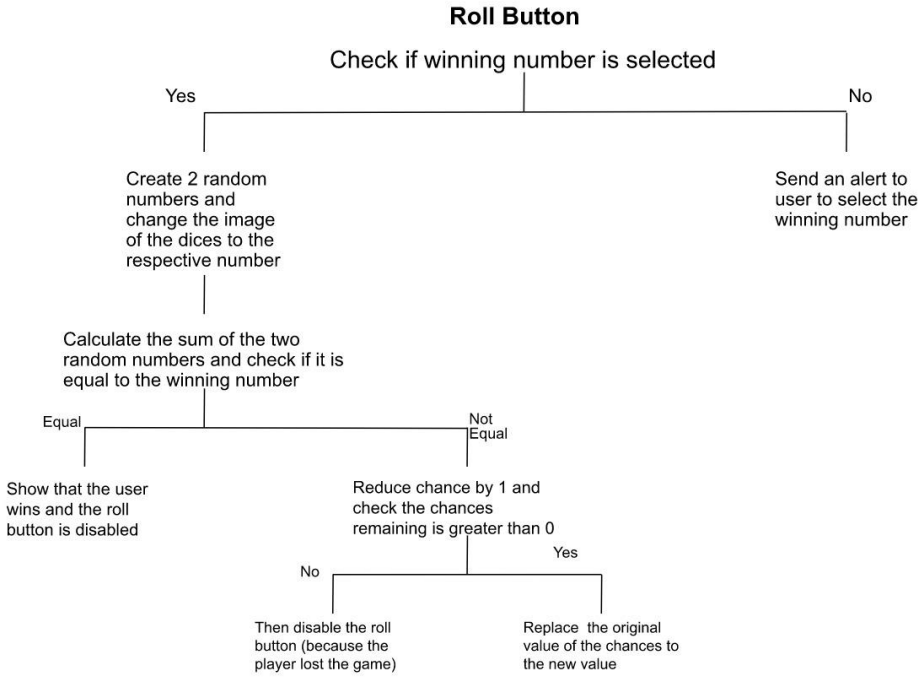
Session 9 : Loop to iterate over arrays and objects
Duration: 2hr

- For..of loop
- For..in loop

- **Assignment:** Make the **Dice Game 2** as shown in the video [Dice Game 2 Video]

Instructions:
To play the game the user needs to select a win number first by clicking the **Click for win number** button, The user only has 10 chance to roll the 2 dice and win (win number should be equal to the sum of number on each dice)

Click for win number: when clicked you will have to create a win number in the range of 2 to 12 . when clicked once the button should be disabled
Roll:



Reset : When clicked turn the winning number to 0, chances to 10, dice image to face 1, Click to win number and roll button should be not be disabled

Session 10 : Nested Loop

Duration: 2hr

- Nested for Loop
- Access element using nested for…of loop and for…in loop
    - Array inside array
    - array inside object
    - object inside object
    - object inside array

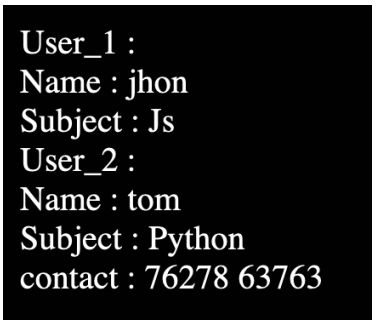
  And displaying data in the HTML Page.

For Example,

Data:

```
var data = {
"User_1":{"Name":"jhon","Subject":"Js"},
"User_2":{"Name":"tom",
          "Subject" : "Python",
          "contact":[[[76278,63763]]]}
};
```

Result in HTML Page:



NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE:** Write the JavaScript code to make the design using nested for loop
  1.
```
*
**
***
****
*****
```
  2.
```
*****
****
***
**
*
```

- **EXERCISE :**

```
var std_data = {
data : [{name:"std1",
        email:"std1@gmail.com"},
        {name:"std2",
        email:"std2@gmail.com"}]
}
```

- **EXERCISE :** Read the following value

```
var data1 =
{
"page": 1,
"per_page": 6,
"total": 12,
"total_pages": 2,
"users": [
{
id: 1,
email: "george.bluth@reqres.in",
first_name: "George",
last_name: "Bluth",
avatar: "https://reqres.in/img/faces/1-image.jpg" },
{
id: 2,
```

```
email: "janet.weaver@reqres.in",
first_name: "Janet",
last_name: "Weaver",
avatar: "https://reqres.in/img/faces/2-image.jpg" },
{
id: 3,
email: "emma.wong@reqres.in",
first_name: "Emma",
last_name: "Wong",
avatar: "https://reqres.in/img/faces/3-image.jpg" },
{
id: 4,
email: "eve.holt@reqres.in",
first_name: "Eve",
last_name: "Holt",
avatar: "https://reqres.in/img/faces/4-image.jpg" },
{
id: 5,
email: "charles.morris@reqres.in",
first_name: "Charles",
last_name: "Morris",
avatar: "https://reqres.in/img/faces/5-image.jpg" },
{
id: 6,
email: "tracey.ramos@reqres.in",
first_name: "Tracey",
last_name: "Ramos",
avatar: "https://reqres.in/img/faces/6-image.jpg"
}
],
"support": {
"url": "https://reqres.in/#support-heading",
"text": "To keep ReqRes free, contributions towards server costs
are appreciated!"
}
}
```

- **EXERCISE :** Read the following value

```
var data4= {"widget": {
    "debug": "on",
    "window": {
        "title": "Sample Konfabulator Widget",
       "name": "main_window",
       "width": 500,
       "height": 500
    },
   "image": {
        "src": "Images/Sun.png",
        "name": "sun1",
       "hOffset": 250,
       "vOffset": 250,
       "alignment": "center"
    },
   "text": {
        "data": "Click Here",
        "size": 36,
        "style": "bold",
       "name": "text1",
       "hOffset": 250,
       "vOffset": 100,
       "alignment": "center",
        "onMouseUp": "sun1.opacity = (sun1.opacity / 100) * 90;"
    }
}}
```

- **EXERCISE :** Read the following value

```
var data3 = {"menu": {
  "id": "file",
  "value": "File",
  "popup": {
    "menuitem": [
      {"value": "New", "onclick": "CreateNewDoc()"},
      {"value": "Open", "onclick": "OpenDoc()"},
      {"value": "Close", "onclick": "CloseDoc()"}
    ]
  }
}}
```

Session 11: JavaScript Events
Duration: 2hr

- Attribute onclick = “func()”
- Attribute onmouseover =”func()”
- Attribute onmouseout = “func()”
- Attribute onmouseup = “func()”
- Attribute onmousedown = “func()”
- Attribute ondblclick = “func()”
- Attribute oninput = “func()”
- Attribute onselect = “func()”
- Attribute oncopy = “func()”
- Attribute onpaste = “func()”
- Attribute oncut = “func()”
- Attribute onblur = “func()”
- Attribute onfocus = “func()”
- Attribute onchange = “func()” is for select
- Attribute onmousemove = “func()”
- This in function

- **Assignment:** Make a **greeting card generator** with input field on one side and the Birthday greeting card on the other side, such that when an input is entered in the input area we can see the changes in the card area. The card generator should use oninput, onchange, etc.

Session 12 : Making accordion and nav-tab using JavaScript
Duration: 2hr

- Try making an **accordion**
- Make **Nav and Tab** using JavaScript

NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE:** Calculate factorial of a number
- **EXERCISE:** Convert numbers into words
- **EXERCISE:** Check if a word is a palindrome

Session 13 : Making modal and carousel using JavaScript
Duration: 2hr

- Make a **modal** using this in JavaScript
- Make a **carousel** using JavaScript
- **EXERCISE:** Calculate the number of characters in a sentence
- **EXERCISE:** Calculate the number of characters and words in a sentence

- **Assignment:** Make the **modal** as shown in the portfolio session of the webpage Website Link

Session 14 : Switch case
Duration: 2hr

- **break;**
- **continue;**
- **Switch case**
- Return in function
- eval()

NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE:** Return the sum of 2 statements
- **EXERCISE:** Convert minutes into seconds
- **EXERCISE:** Return next number from the integer passed
- **EXERCISE:** Convert Age to Days (Use 365 days as the length of a year)
- **EXERCISE:** Convert minutes into hours:minutes:seconds
- **EXERCISE:** Check if the sum of two number is greater than 100

- **Assignment:** Make a **calculator** using eval() function as shown in the video Calculator Video

Session 15 : Timing functions
Duration: 2hr

- setTimeout()
- clearTimeout()
- setInterval()
- clearInterval()
- **EXERCISE:** Make a progress bar using setInterval() and clearInterval()

NOTE: For every exercise problem, give the question to students and then ask them to solve it. After 5-10 minutes, show them the solution and logic.

- **EXERCISE:** Write a code that shows still running until the random number generated is 3 and when random number is 3 it shows interval cleared

- **Assignment:** Make the **stop watch** as shown in the video using setInterval() and clearInterval() Stop watch

Session 16: Creating DOM Elements
Duration: 2hr

- Accessing elements
  - document.querySelector()
  - document.querySelectorAll()
- Adding & removing elements
  - .createElement()
  - .appendChild()
  - .createTextNode()
  - .remove()
  - .childNodes
  - .children
  - .parentNode
- Event Handling
  - document.addEventListener()
  - document.removeEventListener()

- **Assignment:** Make the **to-do list** as shown in the video using DOM. To Do List Video

Session 17 : Responsive Navbar
Duration: 2hr

- Make a Responsive Navbar using JavaScript
- **EXERCISE:** change the background color of the header on scroll (**HINT :** Window.onscroll = function(){})

- **Assignment:**

Session 18 : Form Validation

Duration: 2hr

- Form validation for name using regex
- Form validation for email using regex
- Form validation for phone number using regex

Session 19 : Form Validation

Duration: 2hr

- Form validation for radio
- Form validation for checkbox
- **Assignment:** Create the form in the link with styling and form validation
  Form Link