JavaScript

(1) What is JavaScript. How to use it?

- JavaScript is a scripting language for webpages. Use it using script tag or make an external js file.

(2) How many types of variables in JavaScript?

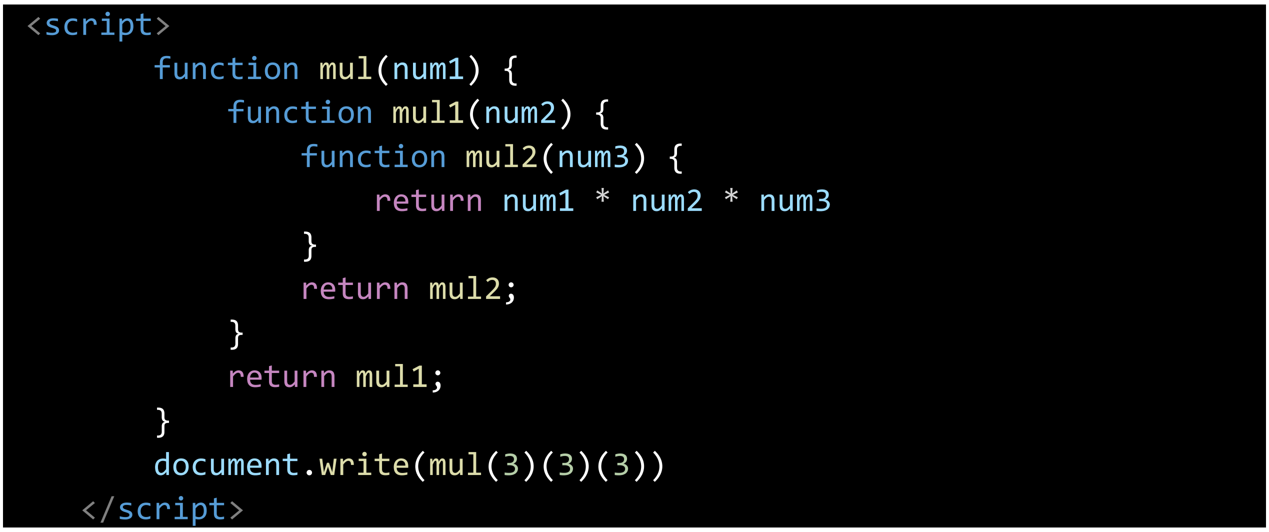
- 3 types of variables in JavaScript.

(3) Define a data type if js?

- There are 2 types of datatypes:
  1. Primitive
  2. Non-primitive

(4) Write a mul function. Which will work properly when invoked with following syntax.

- mul() is a very small kind of multiplication function. We can implement this function using nested mul().
  For ex,

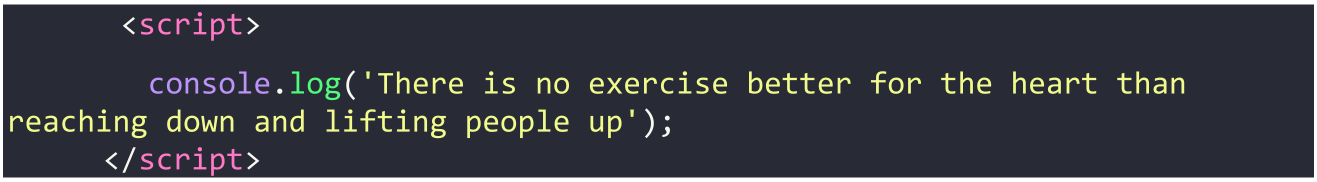


```
<script>
       function mul(num1) {
           function mul1(num2) {
               function mul2(num3) {
                   return num1 * num2 * num3
               }
               return mul2;
           }
           return mul1;
       }
       document.write(mul(3)(3)(3))
   </script>
```

(5) What the deference between undefined and undeclare in JavaScript?

- Undefined : it occurs when a variable has been declared but has not been assigned any value. It is not a keyword.
- Undeclared : it occurs when we try to access any variable that is not initialized or declared earlier using the var or const keyword.

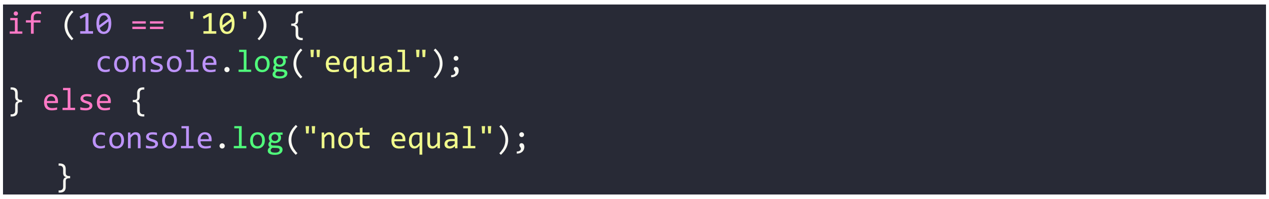
(6) Using console.log() print out the following statement :
The quote 'There is no exercise better for the heart than reaching down and lifting people up.' by John Holmes teaches us to help one another.



```
      <script>

        console.log('There is no exercise better for the heart than 
reaching down and lifting people up');
     </script>
```

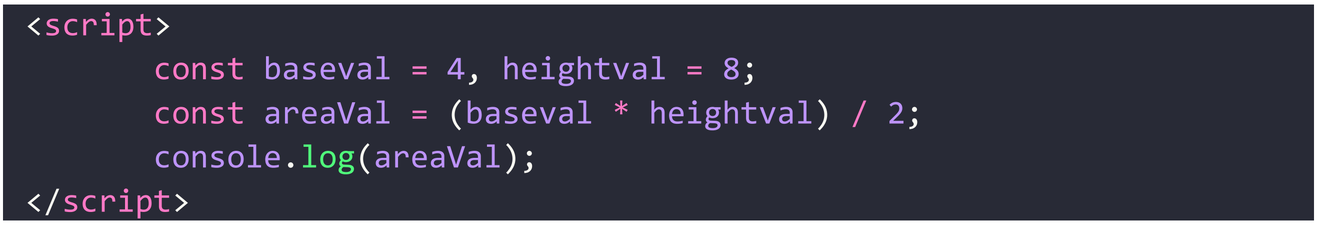
(7) Check if typeof '10' is exactly equal to 10. If not make it exactly equal?

- Using comparison operator.



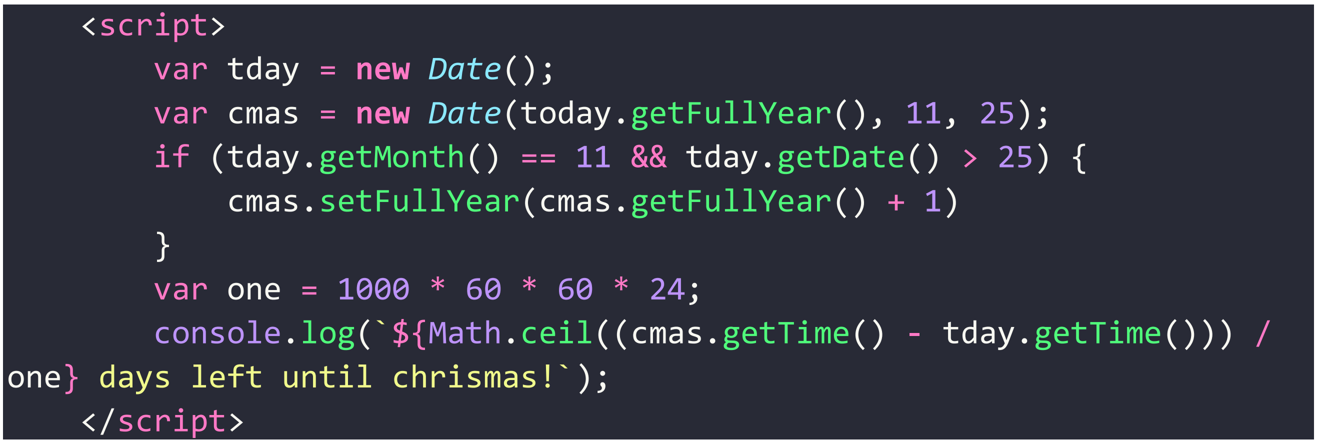
```
if (10 == '10') {
     console.log("equal");
} else {
    console.log("not equal");
  }
```

(8) Write a JavaScript program to find the area of a triangle?



```
<script>
       const baseval = 4, heightval = 8;
       const areaVal = (baseval * heightval) / 2;
       console.log(areaVal);
</script>
```

(9) Write a JavaScript program to calculate days left until next Christmas?

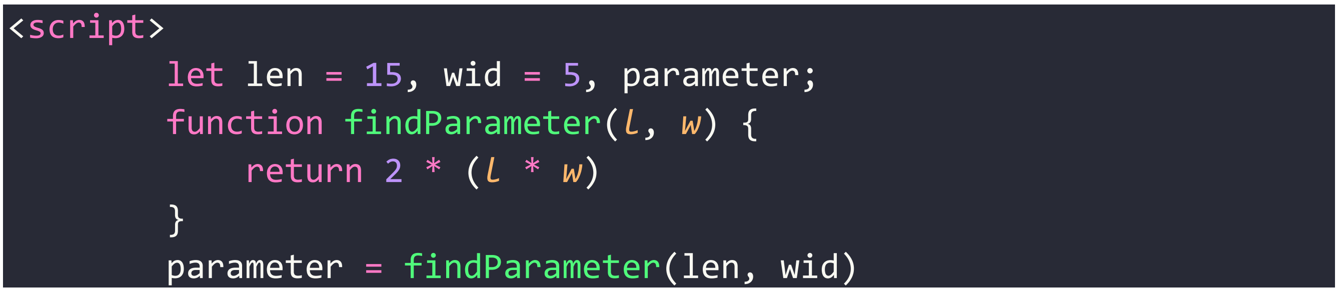


```
    <script>
        var tday = new Date();
        var cmas = new Date(today.getFullYear(), 11, 25);
        if (tday.getMonth() == 11 && tday.getDate() > 25) {
            cmas.setFullYear(cmas.getFullYear() + 1)
        }
        var one = 1000 * 60 * 60 * 24;
        console.log(`${Math.ceil((cmas.getTime() - tday.getTime())) /
one} days left until chrismas!`);
    </script>
```

(10) What is condition statement?

- It is used to control behaviour in JavaScript and determine whether or not pieces of code can run.
- There are multiple different type of conditional statement :
  (1) If statement
  (2) If else statement
  (3) If else if statement
  (4) Nested if statement
  (5) Switch statement

(11) Find circumference of Rectangle formula : C = 4 * a?



```
<script>
        let len = 15, wid = 5, parameter;
        function findParameter(l, w) {
            return 2 * (l * w)
        }
        parameter = findParameter(len, wid)
        console.log(`The parameter of a rectangle with length is
${len} units and width is ${wid} units. parameter is :
${parameter}`);
    </script>
```

(12) Write a program to convert years into days and days into years?

```
 <script>
        let day, week, year;
        day = 1329;

        year = day / 365;
        week = (day % 365) / 7;
        day = day - ((year * 365) + (week * 7))

        console.log(`Days is : ${day}`);
        console.log(`Month is : ${week}`);
        console.log(`Year is : ${year}`);
    </script>
```

(13) Convert temperature Fahrenheit to Celsius? (conditional logic question)

```
 <script>
        let cel, fah = 500;
        cel = (fah - 32) * 5 / 9;
        console.log(cel);
 </script>
```

(14) Write a JavaScript exercise to get the extension of a filename?

```
<script>
        function getFileEx(filename) {
            const extn = filename.split('.').pop();
            return extn;
        }

        const res = getFileEx('module.ts');
        console.log(res);

        const res1 = getFileEx('module.js');
        console.log(res1);
    </script>
```

(15) What is the result of the expression (5 > 3 && 2 < 4)?

- true

(16) What is the result of the expression (true && 1 && "hello")?

- hello

(17) What is the result of the expression true && false || false && true?

- false

(18) What is a loop and switch case in JavaScript define that?

- Loops are used in JavaScript to perform repeated tasks based on a condition. It is count fixed numbers of iteration.
- Switch case evaluates an expression. The value of the expression is then compared with the values of each case in the structure.

(19) What is the use of isNaN function?

- isNaN() is short not a number. It return true if a value is NaN and the type is a number.

(20) What is the difference between && and || in JavaScript?

- && is a logical and operator, in which the operator returns true if all relational statements combined with && are true, else it returns false.
- || is a logical or operator, in which the operator returns true if at least one of the relational statements combined with || is true, else it returns false.

(21) What is use of Void(0)?

- It can evaluate an expression and returns undefined. By running void(0) in the URL JavaScript code, nothing is evaluated or returned.

(22) Check number is positive or negative in JavaScript?

- We can use if condition to check number is positive or negative or using Math.sign() method to check number negative, positive or zero.

(23) Find the character is Vowel or Not?

```
function checkChar(char) {
     ch = char.toLowerCase();
     const regex = /^[aeiou]$/i;
     if (regex.test(ch)) {
         console.log("given character is vowel");
     } else {
         console.log("given character is constant");
     }
}
checkChar('a')
checkChar('c')
```

(24) Write to check whether a number is negative, positive or zero?

```
let number = -1;
if (number > 0) {
   console.log("number is positive");
} else if (number < 0) {
   console.log("number is negative");
} else {
   console.log("number is zero");
}
```

(25) Write to find number is even or odd using ternary operator in JS?

```
 <script>
      let num = 5;
      let res = (num % 2 == 0) ? "number is even" : "number is odd";
      console.log(res);
 </script>
```

(26) Write find maximum number among 3 numbers using ternary operator in JS?

```
let a = 21, b = 22, c = 23;
let result = (a > b && a > c) ? (a) : ((b > c) ? (b) : (c));
console.log(result);
```

(27) Write to find minimum number among 3 numbers using ternary operator in JS?

```
let a = 21, b = 22, c = 23;
let result = (a < b && a < c) ? (a) : ((b < c) ? (b) : (c));
console.log(result);
```

(28) Write to find the largest of 3 numbers in JS?

```
var numbers = [23, 65, 77, 34, 100, 6, 2, 111]
numbers.sort((a, b) => a - b);
numbers.reverse();

for (let n of numbers) {
   console.log(n);
}
```

(29) Write to show :

i. Monday to Sunday using switch case in JS?

```
<script>
        let week = 3;
        switch (week) {
            case 1:
                console.log("Monday");
                break;
            case 2:
                console.log("Tuesday");
                break;
            case 3:
                console.log("Wednesday");
                break;
            case 4:
                console.log("Thursday");
                break;
            case 5:
                console.log("Friday");
                break;
            case 6:
                console.log("Saturday");
                break;
            case 7:
                console.log("Sunday");
                break;
            default:
                console.log("wrong value");
                break;
        }
    </script>
```

ii. Vowel or Consonant using switch case JS?

```
<div>
   <label for="">Enter any Character :</label>
   <input type="text" name="" id="ch">
    <div>
     <button onclick="return checkCharacter()">check</button>
    </div>
   </div>
   <div id="msg"></div>
   <script>
       function checkCharacter() {
         var ch;
         ch = document.getElementById("ch").value;
         if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
            switch (ch) {
               case 'a':
               case 'e':
               case 'i':
               case 'o':
```

```
        case 'u':
        case 'A':
        case 'E':
        case 'I':
        case 'O':
        case 'U':
         document.getElementById("msg").innerHTML = "vowel
character";
         break;
        default:
         document.getElementById("msg").innerHTML = "Consonant
character";
         break;
        }
      }
      else {
        document.getElementById("msg").innerHTML = "Please Enter
Character";
      }
    }
</script>
```

(Conditional looping logic Question)

(30) What are the looping structures in JavaScript? Any one example.

- Looping structures are :
  - (1) While loop
  - (2) Do..while loop
  - (3) For loop
  - (4) Foreach loop
  - (5) For..in loop
  - (6) For..of loop
- Example,

```
<script>
    for (let i = 1; i <= 5; i++) {
      console.log(i);
    }
</script>
```

(31) Write a print 972 to 897 using for loop in js?

```
let i = 972;
for (i = 972; i >= 897; i--) {
  console.log(i);
```

```
 }
```

(32) Write to print factorial of given number?

```
<script>
        let fact = 1, num = 5;
        for (var i = 1; i <= num; i++) {
            fact *= i;
        }
        document.write(`Factorial Number ${num} is ${fact}`);
        console.log(`Factorial Number ${num} is ${fact}`);
</script>
```

(33) Write to print Fibonacci series up to given number?

```
 <script>
        function fibonacci_print(n) {
            if (n == 0) {
                return 0
            } else if (n == 1) {
                return 1
            } else {
                return fibonacci_print(n - 2) + fibonacci_print(n - 1)
            }
        }
        let n = 7;
        for (let i = 0; i < n; i++) {
            document.write(fibonacci_print(i) + "<br>")
        }
</script>
```

(34) Write to print number in reverse order. E.g. number = 64728 → reverse = 82746 in Js?

```
let num1 = 64728;
let res = num1.toString().split('').reverse().join('');
console.log(res);
```

(35) Write a program make a summation of given number (E.g. 1523 Ans: 11) in JS?

```
<script>
   function sumDigit(num) {
      let numStr = num.toString(), sum = 0;
      for (let digit of numStr) {
           sum += parseInt(digit)
      }
      return sum;
   }
   console.log(sumDigit(789));
</script>
```

(36) Write a program you have to make a summation of first and last Digit. (E.g. 1234 Ans : 5) in Js?

```
function firstDigit(n) {
     while (n >= 10) {
         n /= 10
     }
     return Math.floor(n)
}
function lastDigit(n) {
     return Math.floor(n % 10)
}
let n = 12345;
console.log(firstDigit(n) + lastDigit(n))
```

(37) Use console.log() and escape characters to print the following pattern in Js?

```
1 1 1 1 1
2 1 2 4 8
3 1 3 9 27
4 1 4 16 64
5 1 5 25 125
```

```
<script>
   function generateTable(row, col) {
       for (let i = 1; i <= row; i++) {
           let row = '';

           for (let j = 1; j <= col; j++) {
               let val;
               switch (j) {
                   case 1:
                       val = i + ' ';
                       break;
                   case 2:
                       val = 1 + ' ';
                       break;
                   case 3:
                       val = i + ' ';
                       break;
                   case 4:
                       val = i ** 2 + ' ';
                       break;
                   case 5:
                       val = i ** 3 + ' ';
                       break;
                   default:
                       break;
                }
                row += val + '';
             }
             console.log(row);
         }
    }
    generateTable(5, 5)
</script>
```

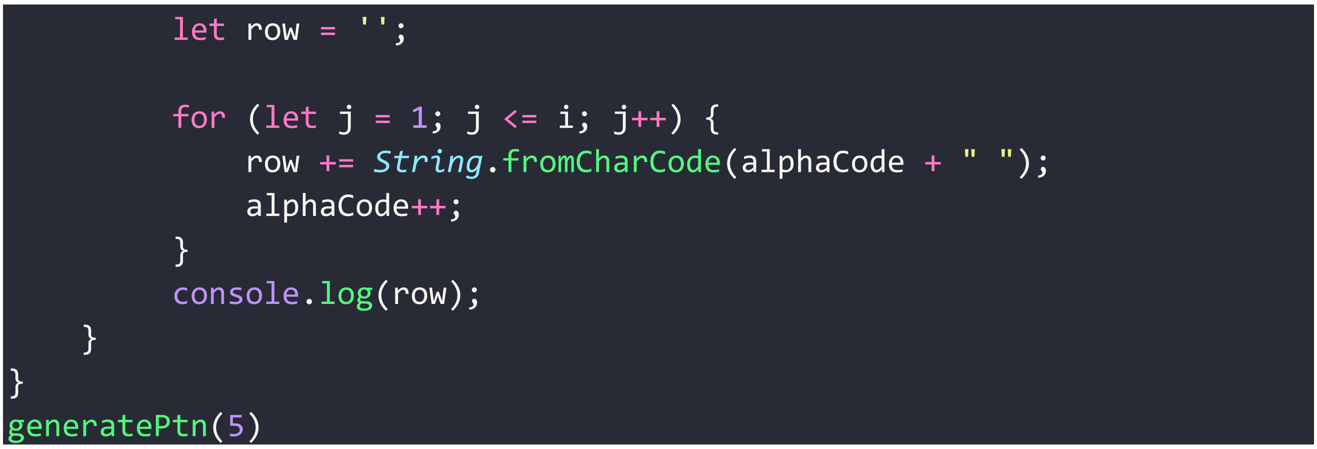
(38) Use pattern in console.log in Js?

1
1 0
1 0 1
1 0 1 0
1 0 1 0 1

```
function generatePtn(row) {
     for (let i = 1; i <= row; i++) {
         let row = '';

         for (let j = 1; j <= i; j++) {
             if (j % 2 == 0) {
                 row += '0 '
             } else {
                 row += '1 '
             }
          }
          console.log(row);
     }
}
generatePtn(5)
```

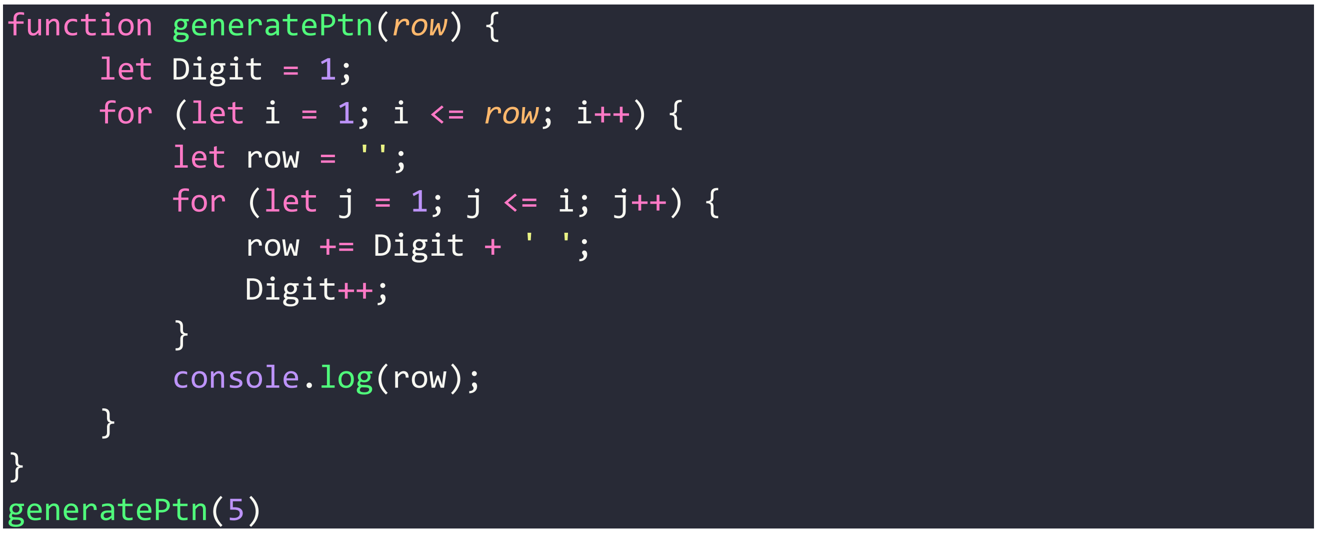
A
B C
D E F
G H I J
K L M N O

```
function generatePtn(row) {
     let alphaCode = 65
     for (let i = 1; i <= row; i++) {
```



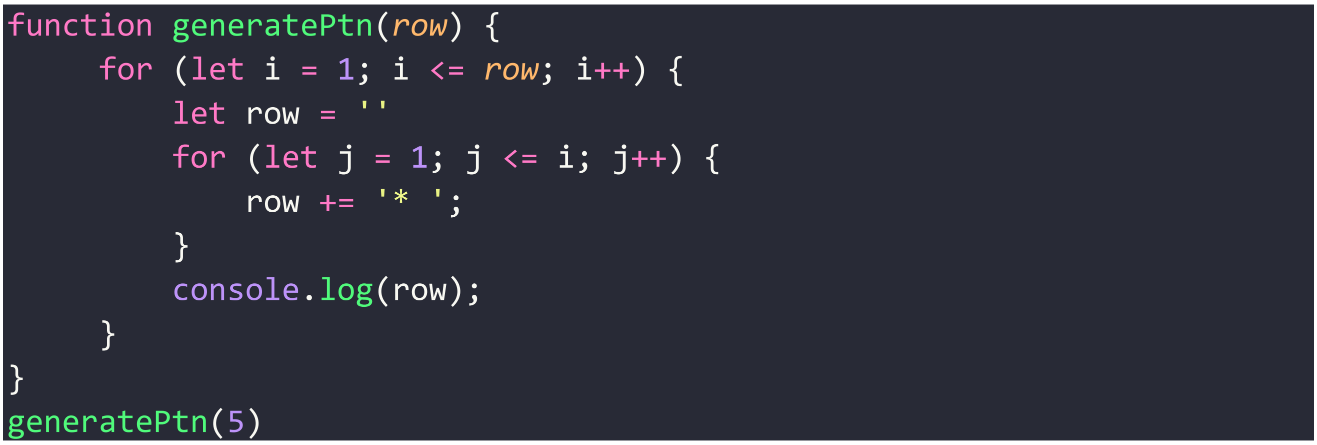
```
         let row = '';

         for (let j = 1; j <= i; j++) {
             row += String.fromCharCode(alphaCode + " ");
             alphaCode++;
         }
         console.log(row);
    }
}
generatePtn(5)
```

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```



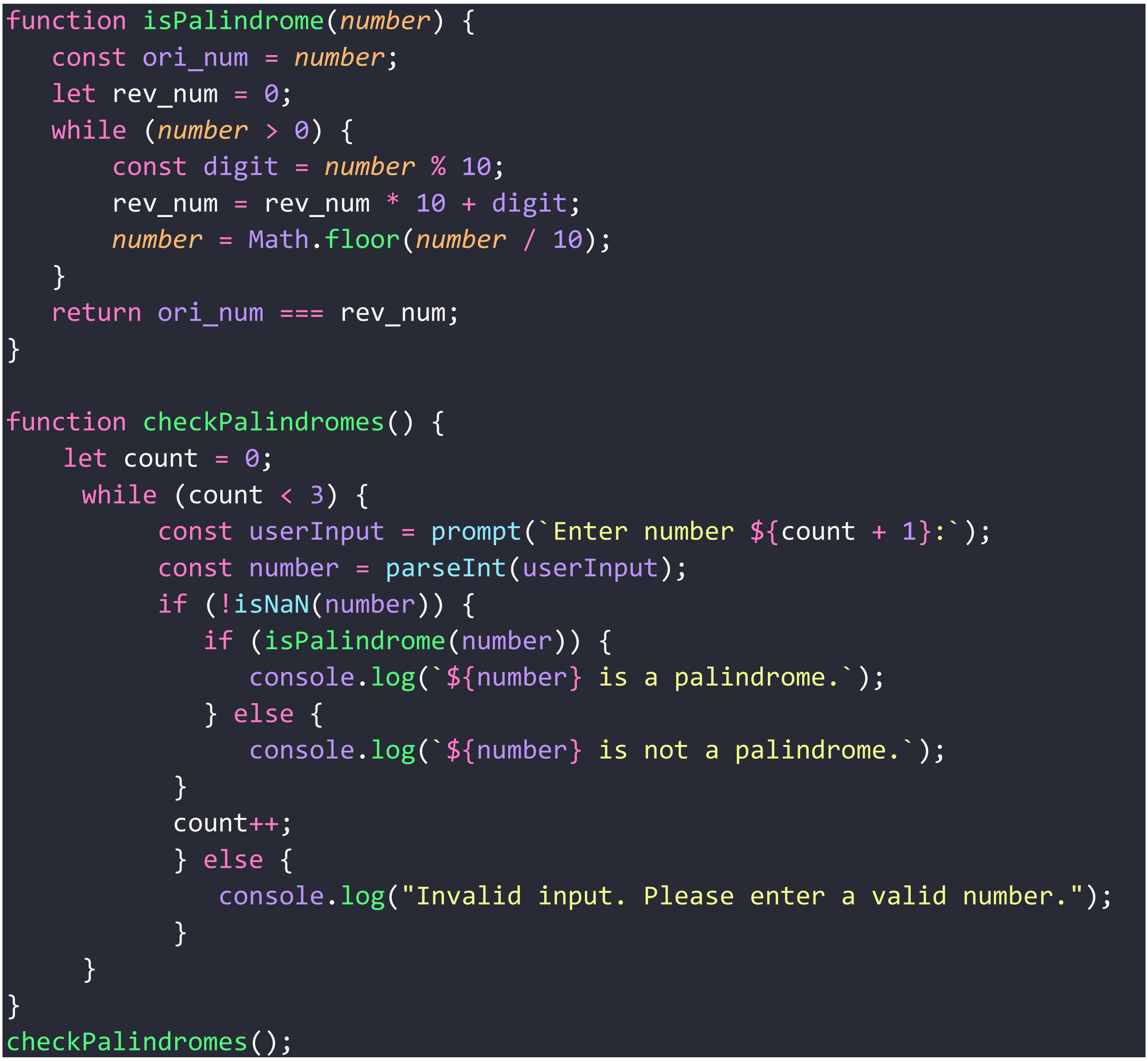
```
function generatePtn(row) {
     let Digit = 1;
     for (let i = 1; i <= row; i++) {
         let row = '';
         for (let j = 1; j <= i; j++) {
             row += Digit + ' ';
             Digit++;
         }
         console.log(row);
     }
}
generatePtn(5)
```

```
*
* *
* * *
* * * *
* * * * *
```



```
function generatePtn(row) {
     for (let i = 1; i <= row; i++) {
         let row = ''
         for (let j = 1; j <= i; j++) {
             row += '* ';
         }
         console.log(row);
     }
}
generatePtn(5)
```

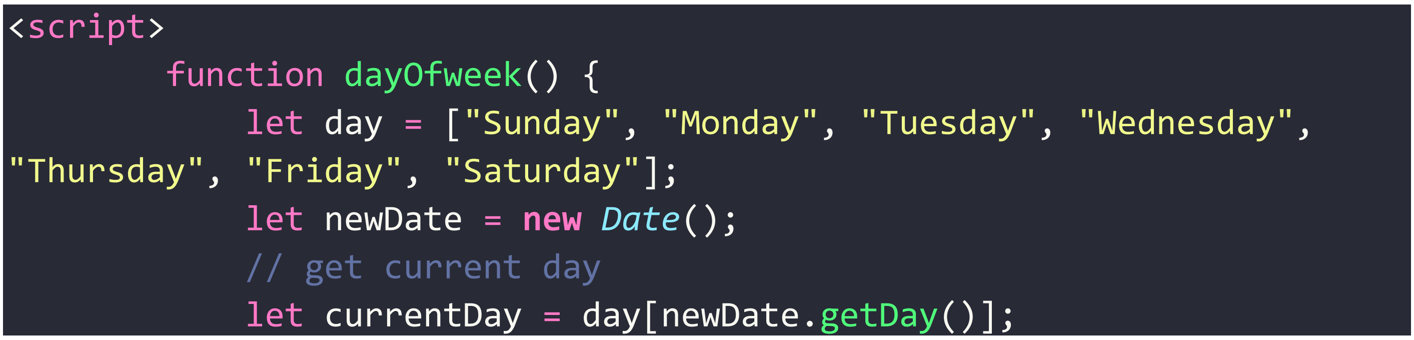
(39) Accept 3 numbers from user using while loop and check each numbers palindrome?



```
function isPalindrome(number) {
   const ori_num = number;
   let rev_num = 0;
   while (number > 0) {
       const digit = number % 10;
       rev_num = rev_num * 10 + digit;
       number = Math.floor(number / 10);
   }
   return ori_num === rev_num;
}

function checkPalindromes() {
    let count = 0;
     while (count < 3) {
          const userInput = prompt(`Enter number ${count + 1}:`);
          const number = parseInt(userInput);
          if (!isNaN(number)) {
             if (isPalindrome(number)) {
                console.log(`${number} is a palindrome.`);
             } else {
                console.log(`${number} is not a palindrome.`);
           }
           count++;
           } else {
              console.log("Invalid input. Please enter a valid number.");
           }
     }
}
checkPalindromes();
```

(Array and Object Question)

(40) Write a JS program to display the current day and time in following format. Sample output: Today is Friday. Current Time is 12 PM: 12 : 22 2?



```
<script>
        function dayOfweek() {
            let day = ["Sunday", "Monday", "Tuesday", "Wednesday",
"Thursday", "Friday", "Saturday"];
            let newDate = new Date();
            // get current day
            let currentDay = day[newDate.getDay()];
            let currentTime = newDate.getHours();
            let ampm = currentTime >= 12 ? "pm" : "am";

            if (currentTime > 12) {
                currentTime -= 12
            } else if (currentTime === 0) {
                currentTime = 12
            }

            let min = newDate.getMinutes();
            let sec = newDate.getSeconds();
            document.write(`Today is ${currentDay} and current time is
: ${currentTime}:${min}:${sec}:${ampm}`)
        }
        dayOfweek();
    </script>
```

(41) Write a JS program to get the current date?

```
let d = new Date();
        document.write(`Today date is : ${d.getDate()}-
${d.getMonth() + 1}-${d.getFullYear()}`)
```

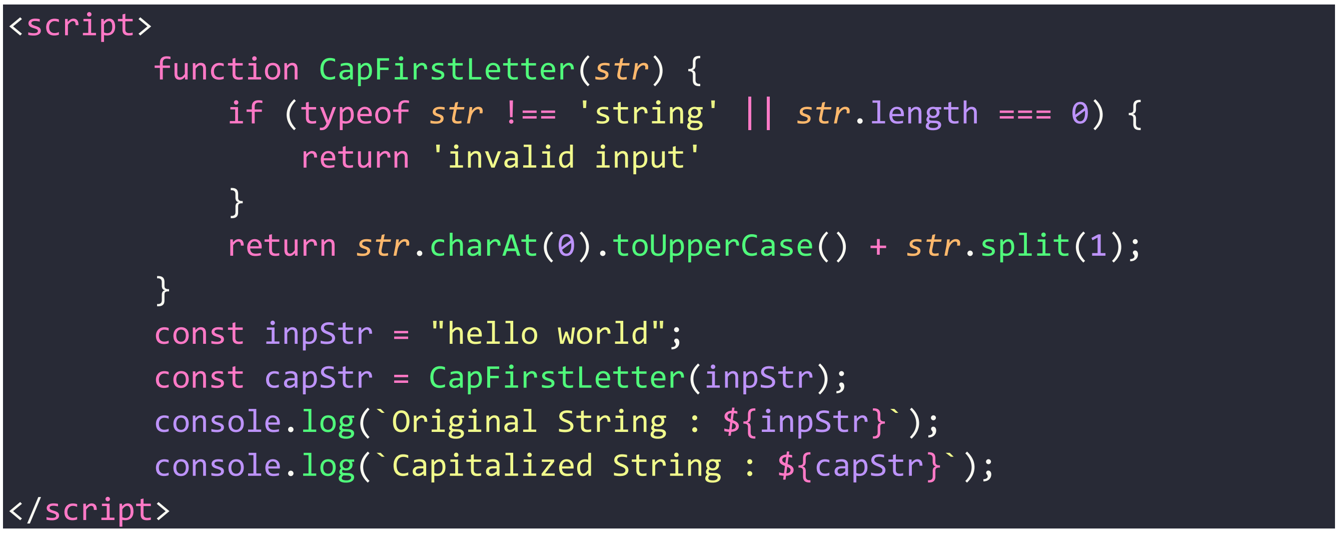
(42) Write a JS program to compare two objects?

```
<script>
        function compareObject(obj1, obj2) {
            const ob1 = Object.keys(obj1);
            const ob2 = Object.keys(obj2);

            if (ob1.keys !== ob2.keys) {
                return false
            }

            for (const key of ob1) {
                if (obj1[key] != obj2[key]) {
                    return false
                }
            }
            return true
        }
        const object1 = { num1: 1, num2: 2, num3: 3 }
        const object2 = { num1: 1, num2: 2, num3: 3 }
        if (compareObject(object1, object2)) {
            document.write("object are equal")
        } else {
            document.write("object are not equal")
        }
</script>
```

(43) Write a JS program to convert an array of objects to CSV string?

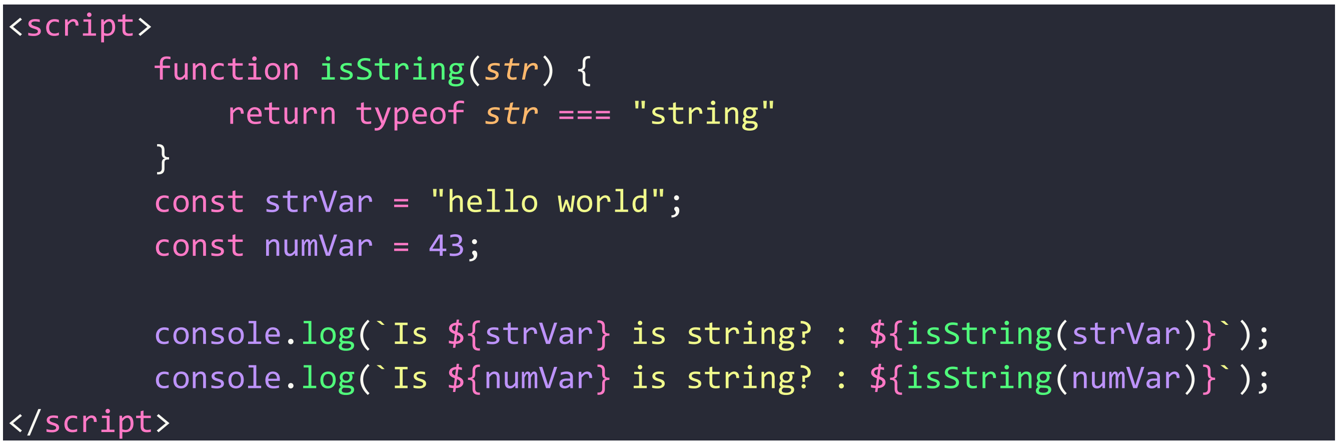
```
<script>
        function convertArrayToCSV(dataArray) {
            if (!Array.isArray(dataArray) || dataArray.length === 0 || typeof dataArray[0] !== 'object') {
                console.log('Invalid input. Please provide an array of objects.');
                return '';
            }
            const headers = Object.keys(dataArray[0]);
            const csvHeader = headers.join(' | ');

            const csvRows = dataArray.map(obj => {
                return headers.map(header => obj[header]).join(' | ');
            });

            const csvString = [csvHeader, ...csvRows].join('\n');
            return csvString;
        }

        // Example usage
        const data = [
            { name: 'Dipak', age: 30, city: 'Surat' },
            { name: 'Binal', age: 25, city: 'Navsari' },
            { name: 'Vijay', age: 35, city: 'Baroda' }
        ];

        const csvResult = convertArrayToCSV(data);
        console.log(csvResult);
</script>
```

(44) Write a JS program to capitalize first letter of a string?



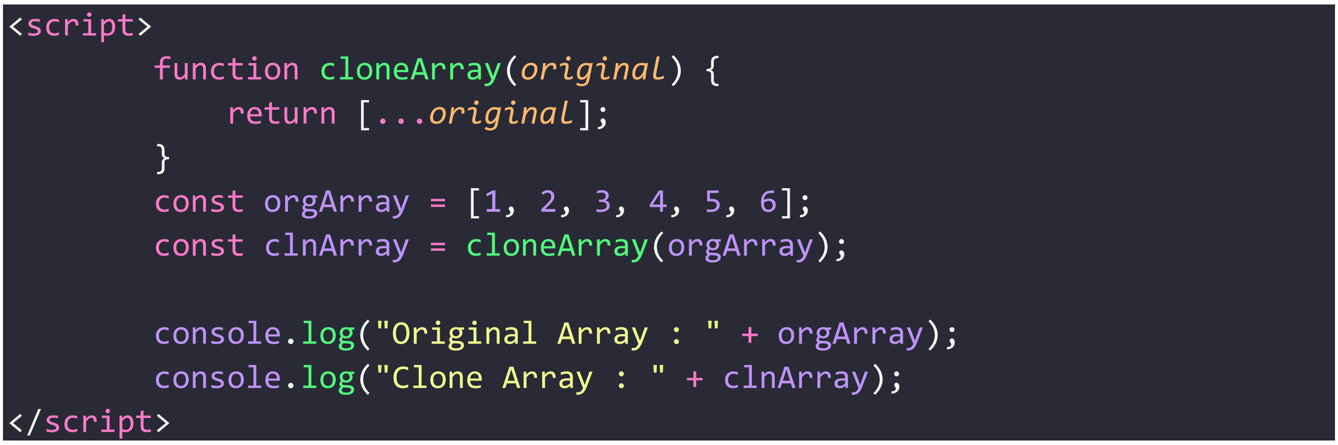
```
<script>
        function CapFirstLetter(str) {
            if (typeof str !== 'string' || str.length === 0) {
                return 'invalid input'
            }
            return str.charAt(0).toUpperCase() + str.split(1);
        }
        const inpStr = "hello world";
        const capStr = CapFirstLetter(inpStr);
        console.log(`Original String : ${inpStr}`);
        console.log(`Capitalized String : ${capStr}`);
</script>
```

(45) Write a JS program to determine if a variable is string?



```
<script>
        function isString(str) {
            return typeof str === "string"
        }
        const strVar = "hello world";
        const numVar = 43;

        console.log(`Is ${strVar} is string? : ${isString(strVar)}`);
        console.log(`Is ${numVar} is string? : ${isString(numVar)}`);
</script>
```

(46) Write a JS program to clone an array?



```
<script>
        function cloneArray(original) {
            return [...original];
        }
        const orgArray = [1, 2, 3, 4, 5, 6];
        const clnArray = cloneArray(orgArray);

        console.log("Original Array : " + orgArray);
        console.log("Clone Array : " + clnArray);
</script>
```

(47) What is the drawback of declaring methods directly in JS object?

- **Code Duplication:** If you create multiple instances of an object using the same method, the method is duplicated for each instance. This can lead to increased memory usage and redundancy.

- **Limited Reusability:** Methods declared directly in an object are specific to that object. If you want to reuse the same method in a different context or for a different object, you need to duplicate the method or use alternative techniques like inheritance.
- **Less Encapsulation:** Declaring methods directly in an object may expose the implementation details of an object. This could potentially lead to unintended modifications or interference with the object's internal state.

(48) Print the length of the string on the browser console using console.log()?

```
 let str = "hello user, we learn js"
 let strlen = str.length;
 console.log(strlen);
```

(49) Change all the string characters to capital letters using toUpperCase() method?

```
let str1 = "hello world";
let conupper = str1.toUpperCase();
console.log(conupper);
```

(50) Write a JS program to get the current date. Expected O/P : mm-dd-yyyy, mm/dd/yyyy or dd-mm-yyyy, dd/mm/yyyy?

```
<script>
        let d = new Date();
        document.write(`Date Format (dd-mm-yyyy) : ${d.getDate()}-
${d.getMonth() + 1}-${d.getFullYear()}`);
        document.write(`<br>Date Format (dd/mm/yyyy) :
${d.getDate()}/${d.getMonth() + 1}/${d.getFullYear()}`);
        document.write(`<br>Date Format (dd-mm-yyyy) : ${d.getMonth() +
1}-${d.getDate()}-${d.getFullYear()}`);
        document.write(`<br>Date Format (dd-mm-yyyy) : ${d.getMonth() +
1}/${d.getDate()}/${d.getFullYear()}`);
    </script>
```

(51) Use indexOf to determine the position of the first occurrence of a in 30 Days of JS?

```
let text = "30 days of javascript";
let pos = text.indexOf('a');
   if (pos !== -1) {
      console.log(`the first occurrance of 'a' is at position ${pos}`);
   } else {
      console.log(`'a' is not found in string`);
   }
```

(52) Use lastIndexOf to determine the position of the last occurrence of a in 30 Days of JS?

```
let text = "30 days of javascript";
let pos = text.lastIndexOf('a')
  if (pos !== -1) {
     console.log(`the first occurrance of 'a' is at position ${pos}`);
  } else {
     console.log(`'a' is not found in string`);
  }
```

(53) Form Validation is JS?

- Used to validate the form submitted by the user because it can have inappropriate values. So, validation is must to authenticate user.
- JS provides facility to validate the form on the client-side so data processing will be faster than server-side validation. Most of the web developers prefer JS form validation.
- We can validate name, password, email, date, mobile number and other field.

(54) Form in email, number, password validation?

- Email

```
function emailRegEx(email, msg) {
    // let eEx = /^\w+([\.-]?\w+)*@\w+([\.-]?\w+)*(\.\w{3})+$/
    let eEx = /^[a-z0-9\.#$%^]+@[a-z]+\.[a-z]{2,3}$/;
    if (!(eEx.test(email.value))) {
        document.getElementById(msg).innerHTML = "Enter Proper Email"
        return false
    } else {
        document.getElementById(msg).innerHTML = ""
        return false
    }
}
```

- Number

```
function mobileEx(mobile, msg) {
    let mEx = /^[0-9]*$/;
    let startNo = /^[6-9]/
    if (!(mEx.test(mobile.value)) || (!(startNo.test(mobile.value))) ||
mobile.value.length < 10) {
        document.getElementById(msg).innerHTML = "Invalid Number !!"
        return false;
    } else {
        document.getElementById(msg).innerHTML = ""
        return false;
    }
}
```

- Password

```
function passEx(password, msg) {
    let passEx = /^(?=.*\d)(?=.*[a-z])(?=.*[A-Z])(?=.*[^a-zA-Z0-
9])(?!.*\s).{8,15}$/
    if (!(passEx.test(password.value))) {
        document.getElementById(msg).innerHTML = "Password has uppercase, lowercase, number and special character. first letter must be uppercase"
        return false
    } else {
        document.getElementById(msg).innerHTML = ""
        return false
    }
}
```

(55) Dynamic Form validation in JS?

- https://github.com/urvashidbhavsar/13_jun_TTS_9.30_to_11/tree/main/javascript/13_27-09-2023

(56) How many type of JS event? How to use it?

- Event → it is change in state of an object is known as an event.
- In html, there are various type of event which represent that some activity is performed by the user or by the browser.

Example,

```
<button onclick="alert('hello user')">click here</button>
```

(57) What is BOM vs DOM in JS?

- BOM → stand for Browser Object Model. It is used to interact with the browser.
  BOM objects are :
  (1) Window Object (2) History Object (3) Navigator Object
  (4) Screen Object (5) Document Object

- DOM → stand for Document Object Model. It is represent the whole html document. When html document loaded in the browser, it becomes a document object. It is the root element the represents the html document.

(58) Array vs object defences in JS?

No	Array	Object
1	Array is a collection of similar type of element.	It is an entity having state and behaviour (property and method).

2	Example,
	var a = [1,2,3,4,5]
		Example,
		var person = {
		firstname:"urvashi",
		lastname:"rathod",
		}

3	It has order collection	It has unorder collection.
4	Array are typically used to store homogeneous element.	Objects can store values of different data types as value associated with the value.

(59) Split the string into an array using split() method?

```
let sent = "hello user, we learn js";
let word = sent.split(' ');
console.log(word);
```

(60) Check if the string contains a word script using includes() Method.

```
var sentance = "this is javascript scripting language";
var con_script = sentance.includes("script");
if (con_script) {
   console.log("this string contains the word 'script'");
} else {
   console.log("this string does not contains the word 'script'");
}
```

(61) Change all the string characters to lowercase letters using toLowerCase() method.

```
var ori_string = "Hello World";
var lower = ori_string.toLowerCase();
console.log("Original String : " + ori_string);
console.log("Converted in lower case : " + lower);
```

(62) What is character at index 15 in ’30 Days of JavaScript string? Use charAt() method.

```
var sent = "30 days of JavaScript";
var char = sent.charAt(15);
console.log(`character at index 15 : ${char}`);
```

(63) Copy to one string to another string in JS?

- Using assignment :

```
var original = "hello world";
var copy_line = original;
console.log(`copy sentance is : ${copy_line}`);
```

- Using slice() method :

```
var original = "hello world";
var copy_line = original.slice();
console.log(`using slice method copy sentance : ${copy_line}`);
```

- Using concat() method :

```
var original = "hello world";
var copy_line = "".concat(original)
console.log(`using concat method copy sentance : ${copy_line}`);
```

(64) Find the length of a string without using library function?

```
function findStringLength(str) {
     let length = 0;
     for (let char of str) {
         length++;
     }
     return length;
}
const myString = "Hello, World!";
const len_lib = findStringLength(myString);
console.log(`Length of the string: ${len_lib}`);
```