

MODULE 4 : JAVASCRIPT BASIC & DOM

1.What is javascript ? how it works ?

- JavaScript is a programming language for creating dynamic and interactive web pages.
- It plays a crucial role in both front-end and back-end development.
- How Javascript Work :-
 - First , programmer write complete code.
 - Then , the code goes in javascript engine. Each web browser has its Own javascript engine.
 - When you load a web page with JavaScript, the engine receives the Code.
 - The engine first reads and analyze the code, converting it into a format that computer can understand.
 - The code is executed line by line and then get output.

Q.2 How many type of Variable in JavaScript?

- JavaScript has 8 primitive data types:

Number: Represents numeric values, both integers and decimals.

String: Represents sequences of characters.

Boolean: Represents logical values, either true or false.

Symbol: A unique and immutable identifier.

Null: Represents the intentional absence of a value.

Undefined: Represents a variable that has not been declared or assigned a value.

BigInt: A special type for integers that can hold large values.

Object: A collection of properties where the keys can be strings or symbols.

Q.3 Define a Data Types in js?

- In JavaScript, data types define the type of data a variable can hold.
- They determine how the data is stored in memory and how it can be manipulated.
- javascript has primitive and non-primitive data type.
- primitive Data types :-
 - Number
 - String
 - Boolean
 - Null
 - Undefined
 - Symbol
 - BigInt
- Non-primitive Data type :
 - Object

Q.4 Write a mul Function Which will Work Properly When invoked With Following Syntax.

- It is the simple example of mul function.

```
function mul(x, y) {  
  return x * y;  
}  
  
let result = mul(5, 3);  
console.log(result);  
// Output: 15
```

Q.5 What the difference between undefined and undeclared in JavaScript?

- Undefined:

- A variable is declared but has not been assigned a value yet.
- It exists in the program's memory, but its value is not given.
- Example:-

```
let x;  
console.log(x); // Output: undefined
```

- Undeclared:

- A variable is not declared at all.
- It simply doesn't exist in the program's code.
- Example:-

```
console.log(y); //output : y is not defined
```

Q.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. Using console.log() print out the following quote by Mother Teresa:

```
- console.log("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.")
```

Q.7 Check if typeof '10' is exactly equal to 10.

- **No**, typeof '10' is not exactly equal to 10.
- In JavaScript, the typeof operator returns the data type of a value, not the value itself.
- Here , '10' is a string , which represents a sequence of characters.

- typeof '10' will return the string "string" because it's checking the data type of the characters '1', '0'.
- 10 is a number, a numeric value.

Q.8 Write a JavaScript Program to find the area of a triangle?

```
let b=4;
let h=5;
let area = 0.5*(b*h)
console.log(area)

// output : 10
```

Q.9 Write a JavaScript program to calculate days left until next Christmas?

```
let todayDate = new Date();
// console.log("Today's date is defined as: ", todayDate)
let christmasYear = todayDate.getFullYear();
if (todayDate.getMonth() == 11 && todayDate.getDate() > 25) {
    christmasYear = christmasYear + 1;
}

let christmasDate = new Date(christmasYear, 11, 25);
let dayMilliseconds = 1000 * 60 * 60 * 24;
let daysLeft = Math.ceil(
    (christmasDate.getTime() - todayDate.getTime()) / (dayMilliseconds)
);
console.log("The number of days left for christmas is: ")
console.log(daysLeft)

// output :
// The number of days left for christmas is:
// 196
```

Q.10 What is Condition Statement?

- JavaScript conditional statements allow you to execute specific blocks of code based on conditions.
- If the condition is met, a particular block of code will run otherwise, another block of code will execute based on the condition.
- conditional statement :
 - if statement
 - else statement
 - if-else statement
 - nested-if-else statement
 - switch statement

Q.11 Find circumference of Rectangle formula : $C = 4 * a$?

```
let a=4;
let circumference= 4*a
document.write("circumference of Rectangle : ",circumference)

// output : circumference of Rectangle : 16
```

Q.12 WAP to convert years into days and days into years?

```
const days = prompt("Enter days : ")
const years = prompt("Enter years : ")

const year = days/365 ;
const day = years*365 ;
document.write("Number of year is : " +year+ " year") ;
document.write("<br>")
document.write("number of days is : " +day+ " days") ;

// output
// Enter days : 365
// Enter Year : 2

// Number of year is : 1 year
// number of days is : 730 days
```

Q.13 Convert temperature Fahrenheit to Celsius? (Conditional logic Question)

```
const fahrenheit = prompt("Enter a fahrenheit value: ");

const celsius = (fahrenheit - 32)*5/9
document.write("Tempreture is : "+celsius+ " celsius")

// output :
// Enter a fahrenheit value : 80
// Tempreture is : 26.666 celsius
```

Q.14 Write a JavaScript exercise to get the extension of a filename.?

```
function extension(filename){

const extension = filename.split('.').pop();
return extension;
}
const result = extension('abc.txt');
console.log(result);

output :
txt
```

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

```
document.write((5 > 3 && 2 < 4))

// output
// true
```

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

```
document.write(true && 1 && "hello")

// output
// hello
```

Q.17 What is the result of the expression `true && false || false && true`?

```
document.write(true && false || false && true)

// output
// false
```

Q.18 What is a Loop and Switch Case in JavaScript define that ?

- Loops

Loops are a fundamental control flow mechanism in JavaScript that allow you to execute a block of code repeatedly until a certain condition is met.

Different Loops in javascript :-

- for loop
- while loop
- do..while loop
- for..of loop
- for..in loop

Switch Case

- The switch statement is a control flow structure that allows you to execute different actions based on different conditions.
- Use the switch statement to select one of many code blocks to be executed.

Q.19 What is the use of `isNaN` function?

- The JavaScript **`isNaN()`** Function is used to check whether a given value is an illegal number or not.
- It returns true if the value is a Nan else returns false.

Q.20 What is the difference between && and || in JavaScript?

- In JavaScript , both && (logical AND) and || (logical OR) are operators used for conditional evaluation.

Logical AND (&&):-

- Returns true only if both operands are true values.

Example :-

```
document.write((5 > 3 && 2 < 4))  
  
// output  
// true
```

Logical OR (||) :-

- Returns true if at least one operand is a true value.

Example :-

```
document.write((5 < 3 && 2 < 4))  
  
// output  
// true
```

Q.21 What is the use of Void (0)?

- The void operator is used to evaluate an expression and discard its result, returning the special value undefined.

- 0 is a numeric literal that evaluates to the number zero.

- So, void(0) essentially evaluates to undefined .

Q.22 Check Number Is Positive or Negative in JavaScript?

```
function check(number) {  
    if (number > 0) {  
        document.write("The number is positive."+"<br>"+"");  
    }  
}
```



```

    } else if (number < 0) {
        document.write("The number is negative." + "<br>" + "");
    } else {
        document.write("The number is zero.");
    }
}
}
check(5)
check(-3)

// output:-
// The number is positive.
// The number is negative.

```

Q.23 Find the Character Is Vowel or Not ?

```

const ch=prompt("Enter any alphabet : ")
if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' || ch=='A' || ch=='E' || ch=='I' || ch==
='O' || ch=='U')
{
    document.write("It is vowel")
}
else
{
    document.write("It is consonant")
}

// output :
// Enter any alphabet : U
// It is vowel

```

Q.24 Write to check whether a number is negative, positive or zero?

```

function check(number) {
    if (number > 0) {
        document.write("The number is positive." + "<br>" + "");
    } else if (number < 0) {
        document.write("The number is negative." + "<br>" + "");
    } else {
        document.write("The number is zero.");
    }
}
check(7)
check(0)

// output:-
// The number is positive.
// The number is zero.

```

Q.25 Write to find number is even or odd using ternary operator in JS?

```
function check(number)
{
    return(number%2==0) ? "even" : "odd" ;
}

document.write(check(11))

// output:
// odd
```

Q.26 Write find maximum number among 3 numbers using ternary operator in JS?

```
let a = 5;
let b = 10;
let c = 7;

let max = (a > b) ? (a > c ? a : c) : (b > c ? b : c);

document.write("The maximum number is: " + max);

// output:-
// The maximum number is: 10
```

Q.27 Write to find minimum number among 3 numbers using ternary operator in JS?

```
let a = 1;
let b = 21;
let c = 9;

let min = (a < b) ? (a < c ? a : c) : (b < c ? b : c);

document.write("The minimum number is: " + min);

// output:-
// The minimum number is: 1
```

Q.28 Write to find the largest of three numbers in JS?

```
let a = 15;
let b = 10;
let c = 30;

let large = (a > b) ? (a > c ? a : c) : (b > c ? b : c);

document.write("The largest number is: " + large);

// output:-
// The largest number is: 10
```

Q.29 Write to show

(i). Monday to Sunday using switch case in JS?

```
function check(day) {
  switch(day) {
    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("Invalid day");
      break ;
  }
}
```

```
check(1)
check(2)
check(3)
check(4)
check(5)
check(6)
check(7)

// output:-

// Monday
// Tuesday
// Wednesday
// Thursday
// Friday
// Saturday
// Sunday
```

(ii). Vowel or Consonant using switch case in JS?

```
function check(letter) {
  switch (letter) {
    case 'a':
    case 'e':
    case 'i':
    case 'o':
    case 'u':
    case 'A':
    case 'E':
    case 'I':
    case 'O':
    case 'U':
      console.log("It Is Vowel");
      break;
    default:
      console.log("It is Consonant");
      break;
  }
}
check('A')
check('z')

// output:-
// It Is Vowel
// It is consonant
```

Q.30 What are the looping structures in JavaScript? Any one Example?

- Looping structures in JavaScript are control flow statements that allow you to execute a block of code repeatedly.

- Different Loops in javascript :-

- for loop
- while loop
- do..while loop
- for..of loop
- for..in loop

- Example :-

```
for(let i=0;i<10;i++)
{
    document.write(i)
}
// output:-
// 0123456789
```

Q.31 Write a print 972 to 897 using for loop in JS?

```
for(let i=972;i>=897;i--)
{
    document.write(i);
    document.write("<br>");
}
```

Q.32 Write to print factorial of given number?

```
let n=4
function fact(n){
    let result = 1;
    for(let i=2;i<=n;i++)
        result = result * i;
    return result;
}
```

```

    }

    console.log(fact(n))

    // output:-
    // 24

```

Q.33 Write to print Fibonacci series up to given numbers?

```

function Fibonacci(number){
    let n1 = 0, n2 = 1, sum;

    console.log('Fibonacci Series:');

    for (let i = 1; i <= number; i++) {
        console.log(n1);
        sum = n1 + n2;
        n1 = n2;
        n2 = sum;
    }
}

Fibonacci(5)

// output:-
// 0 1 1 2 3

```

Q.34 Write to print number in reverse order e.g.: number = 64728 ---> reverse =82746 in JS?

```

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

// output:
// 82746

```

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

```

function sumOfDigit(num) {
    let numStr = num.toString();
    let sum = 0;

```

```

    for (let digit of numStr) {
        sum += parseInt(digit);
    }

    return sum;
}

console.log(sumOfDigit(1523));
// output :
// 11

```

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

```

function sumDigit(number) {

    const numberString = number.toString();

    const firstDigit = parseInt(numberString[0], 10);
    const lastDigit = parseInt(numberString[numberString.length - 1], 10);

    const sum = firstDigit + lastDigit;

    return sum;
}

const num1 = 1234;

console.log(sumDigit(num1));

// output :
// 5

```

Q.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

```

```
function pattern(rows) {
  for (let n = 1; n <= rows; n++) {
    let colum1 = n;
    let colum2 = 1;
    let colum3 = n;
    let colum4 = n * n;
    let colum5 = n * n * n;
    console.log(`${colum1} ${colum2} ${colum3} ${colum4} ${colum5}`);
  }
}
pattern(5);

//output :-
// 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
```

Q.38 Use pattern in console.log in JS?

(i) 1
 1 0
 1 0 1
 1 0 1 0
 1 0 1 0 1

```
let rows = 5;

for (let i = 1; i <= rows; i++) {
  let pattern = '';
  for (let j = 1; j <= i; j++) {
    pattern += j % 2 === 0 ? '0 ' : '1 ';
  }
  console.log(pattern);
}

// output :-
// 1
// 1 0
// 1 0 1
// 1 0 1 0
// 1 0 1 0 1
```


(ii) **A**
 B C
 D E F
 G H I J
 K L M N O

```
let n = 5;
let string = "";
let count = 0;

for (let i = 1; i <= n; i++) {
  for (let j = 0; j < i; j++) {
    string = string + String.fromCharCode(count + 65);
    count++;
  }
  string = string + "\n";
}
console.log(string);
// output :
// A
// BC
// DEF
// GHIJ
// KLMNO
```

(iii) **1**
 2 3
 4 5 6
 7 8 9 10
 11 12 13 14 15

```
let n = 5;
let string = "";
let count = 1;

for (let i = 1; i <= n; i++) {

  for (let j = 1; j <= i; j++) {
    string = string + count;
    count++;
  }
}
```

```

    string = string + "\n";
}
console.log(string);

// output :
// 1
// 2 3
// 4 5 6
// 7 8 9 10
// 11 12 13 14 15

```

(iv) *

```

    *
  * *
* * *
* * * *
* * * * *

```

```

let rows = 5;

for (let i = 1; i <= rows; i++) {
  let pattern = "";
  for (let j = 1; j <= i; j++) {
    pattern = pattern + "* ";
  }
  console.log(pattern);
}

// output:-
// *
// * *
// * * *
// * * * *
// * * * * *

```

Q.39 Accept 3 numbers from user using while loop and check each numbers palindrome.

```
let count = 1;

while (count <= 3) {
  let num = prompt(`Enter number ${count}: `);
  let originalNum = num;
  let reversed = 0;
  let remainder;

  // Reverse the number
  while (num !== 0) {
    remainder = num % 10;
    reversed = reversed * 10 + remainder;
    num = Math.floor(num / 10);
  }

  // Check if palindrome
  if (originalNum == reversed) {
    document.write(`${originalNum} is a palindrome.`);
  } else {
    document.write(`${originalNum} is not a palindrome.`);
  }

  count++;
}

// output:-
// Enter number : 222
// Enter number : 456
// Enter number : 121
// 222 is a palindrom.
// 456 is not a palindrom.Enter
// 121 is a palindrom.
```

- **What is JavaScript?**

- JavaScript is a programming language for creating dynamic and interactive web pages.
- It plays a crucial role in both front-end and back-end development.

- **What is the use of isNaN function?**

- The JavaScript **isNaN()** Function is used to check whether a given value is an illegal number or not.

- It returns true if the value is a Nan else returns false.

- **What is negative Infinity?**

- In JavaScript, -Infinity represents negative infinity, which is a special value that is less than all other numbers.

- It can be generated using a self-made function or by an arithmetic operation.

- **Which company developed JavaScript?**

- JavaScript was developed by Brendan Eich while working at Netscape communication in 1995.

- Initially called Mocha, then LiveScript, and now , it is known as JavaScript.

- **What are undeclared and undefined variables?**

- **Undefined:**

- A variable is declared but has not been assigned a value yet.

- It exists in the program's memory, but its value is not given.

- Example:-

```
let x;  
console.log(x); // Output: undefined
```

- **Undeclared:**

- A variable is not declared at all.
- It simply doesn't exist in the program's code.
- Example:-

`console.log(y); //output : y is not defined`

• **What is the difference between ViewState and SessionState?**

ViewState

- Stored on the client-side, usually within a hidden form field.
- Its scope is Limited to a single web page.
- In viewState Can store any serializable data type.
- JavaScript can access the ViewState data through the hidden form field element.

SessionState

- Stored on the server-side.
- across all pages within a user's session.
- Can store any data type that the server-side language supports.
- JavaScript cannot directly access SessionState data.

• **What is === operator?**

- The === operator in JavaScript is the strict equality operator.
- It's used to compare two values and determine if they are exactly the same, considering both the value and the type.

- **How can the style/class of an element be changed?**

- You can use methods like **document.getElementById** or **document.querySelector** to get a reference to the element you want to modify.
- You can access the style property of the element and modify individual style properties like **element.style.color = "red"**.

- **How to read and write a file using JavaScript?**

- The **fs.readFile()** and **rs.writeFile()** methods are used to read and write of a file using javascript on server side.
- On the client side, you can't read or write files in JavaScript browsers.

- **What are all the looping structures in JavaScript?**

- JavaScript offers several looping structures to execute a block of code repeatedly based on certain conditions.

Different Loops in javascript :-

- for loop
- while loop
- do..while loop
- for..of loop
- for..in loop

- **How can you convert the string of any base to an integer in JavaScript?**

- Using **parseInt** function we can convert string of any base to an integer.

- **What is the function of the delete operator?**

- The delete operator in JavaScript serves the purpose of removing a property from an object.

- For an example ,

```
let person =  
{ name: "Vraj",  
  age: 20 };  
delete person.age;  
console.log(person);  
// Output: { name: "Vraj" }
```

- **What are all the types of Pop up boxes available in JavaScript?**

JavaScript offers three main types of pop-up boxes for interacting with users:

Alert Box: This modal dialog displays a message to the user.

Confirm Box: This modal dialog presents a message and two buttons: "OK" and "Cancel".

Prompt Box: This modal dialog displays a message and an input field for the user to enter text.

- **What is the use of Void (0)?**

- The void operator is used to evaluate an expression and discard its result, returning the special value undefined.

- 0 is a numeric literal that evaluates to the number zero.

- So, void(0) essentially evaluates to undefined .

- **How can a page be forced to load another page in JavaScript?**

- Using window.location.href property , page can be force to load another page in javascript.

```
function newPage() {  
  window.location.href = "https://www.google.com"; // Replace with your target  
  URL  
}  
newPage()
```

- **What are the disadvantages of using innerHTML in JavaScript?**

- InnerHTML can be slow, especially when dealing with large amounts of content.
- It replaces the entire content within the element, even if you're only modifying a small part.
- InnerHTML doesn't offer built-in validation.
- Overusing innerHTML can make your code less readable and maintainable.

- **Create password field with show hide functionalities.**

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>PASSWORD</title>
  </head>
  <body>
    <form action="">
      Password : <input type="password" name="password" id="pass" />
      <br />
      <input type="checkbox" name="" id="click" onclick="showPass()" /> Show
      Password
    </form>

    <script>
      let password = document.querySelector("#pass");
      function showPass() {
        if (password.type === "password") {
          password.type = "text";
        } else {
          password.type = "password";
        }
      }
    </script>
  </body>
</html>
```


Output :-

Password :

☐ Show Password

• Create basic math operation in JS.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Calculator</title>
  </head>
  <body>
    <h3>MATHS OPERATION</h3>
    <form action="">
      ENTER 1st NUMBER : <input type="number" name="" id="first_num" />
      <br />
      <br />
      ENTER 2st NUMBER : <input type="number" name="" id="second_num" />
    </form>
    <div style="display: flex">
      <div
        style="
          border: 1px solid black;
          padding: 4px 10px;
          margin: 5px;
          cursor: pointer;
        "
        class="addition"
        onclick="addition()"
      >
        +
      </div>
      <div
        style="
          border: 1px solid black;
          padding: 4px 10px;
          margin: 5px;
          cursor: pointer;
        "
        onclick="substraction()"
      >
        -
      </div>
```

```

<div
  style="
    border: 1px solid black;
    padding: 4px 10px;
    margin: 5px;
    cursor: pointer;
    "
  onclick="multiplication()"
>
  *
</div>
<div
  style="
    border: 1px solid black;
    padding: 4px 10px;
    margin: 5px;
    cursor: pointer;
    "
  onclick="division()"
>
  /
</div>
<div
  style="
    border: 1px solid black;
    padding: 4px 10px;
    margin: 5px;
    cursor: pointer;
    "
  onclick="modulus()"
>
  %
</div>
</div>
<div>Answer is : <span class="answer"></span></div>

<script>
let first_num = document.querySelector("#first_num");
let second_num = document.querySelector("#second_num");

function addition() {
  document.querySelector(".answer").innerHTML =
    parseInt(first_num.value) + parseInt(second_num.value);
}
function subtraction() {
  document.querySelector(".answer").innerHTML =
    first_num.value - second_num.value;
}

```

```

function multiplication() {
    document.querySelector(".answer").innerHTML =
        first_num.value * second_num.value;
}
function division() {
    document.querySelector(".answer").innerHTML =
        first_num.value / second_num.value;
}
function modulus() {
    document.querySelector(".answer").innerHTML =
        first_num.value % second_num.value;
}
</script>
</body>
</html>

```

Output :

MATHS OPERATION

ENTER 1st NUMBER :

ENTER 2st NUMBER :

Answer is : 10

• Create result

```

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Marksheet</title>
</head>
<body>
    <h3>Marksheet</h3>
    <form action="">
        <table>
            <tr>
                <td><label for="clang">1. C Language</label></td>

```

```

        <td><input type="number" name="" id="clang" /></td>
    </tr>
    <tr>
        <td><label for="cpplang">2. C++ Language</label></td>
        <td><input type="number" name="" id="cpplang" /></td>
    </tr>
    <tr>
        <td> <label for="db">3. Database</label></td>
        <td><input type="number" name="" id="db" /></td>
    </tr>
    <tr>
        <td> <label for="html">4. HTML</label></td>
        <td><input type="number" name="" id="html" /></td>
    </tr>
    <tr>
        <td> <label for="css">5. CSS</label></td>
        <td><input type="number" name="" id="css" /></td>
    </tr>
    <tr>
        <td> <label for="php">6. PHP</label></td>
        <td><input type="number" name="" id="php" /></td>
    </tr>
    <tr>
        <td> <label for="java">7. Core Java</label></td>
        <td><input type="number" name="" id="java" /></td>
    </tr>
</table>
</form>
<button style="padding: 4px 10px; margin: 5px;"
onclick="calculateResult()">Result</button>
<div>Total is : <span class="total"></span> / 350</div>
<div>Percentage is : <span class="percentage"></span></div>
</body>

<script>
    function calculateResult()
    {
        let c = parseInt(document.querySelector('#clang').value);
        let cpp = parseInt(document.querySelector('#cpplang').value);
        let db = parseInt(document.querySelector('#db').value);
        let html = parseInt(document.querySelector('#html').value);
        let css = parseInt(document.querySelector('#css').value);
        let php = parseInt(document.querySelector('#php').value);
        let java = parseInt(document.querySelector('#java').value);

        let total = document.querySelector('.total').innerHTML =
c+cpp+db+html+css+php+java;
        document.querySelector('.percentage').innerHTML = (total / 7)*2;
    }

```

```
}  
</script>  
  
</html>
```

OUTPUT :

Marksheet

1. C Language	45
2. C++ Language	43
3. Database	34
4. HTML	38
5. CSS	27
6. PHP	39
7. Core Java	40

Result

Total is : 266 / 350

Percentage is : 76