Module 8) JavaScript

JavaScript Introduction

Theory Assignment

- **Question 1**: What is JavaScript? Explain the role of JavaScript in web development.
- **Question 2**: How is JavaScript different from other programming languages like Python orJava?
- **Question 3**: Discuss the use of `<script>` tag in HTML. How can you link an external JavaScript file to an HTML document?

Lab Assignment(Task)

⇒ Create a simple HTML page and add a `<script>` tag within the page.

⇒ Write JavaScript code to display an alert box with the message "Welcome toJavaScript!" when the page loads.

Variables and Data Types

Theory Assignment

- **Question 1**: What are variables in JavaScript? How do you declare a variable using `var`, `let`,and `const`?
- **Question 2**: Explain the different data types in JavaScript. Provide examples for each.
- **Question 3**: What is the difference between `undefined` and `null` in JavaScript?

Lab Assignment (Task)

⇒ Write a JavaScript program to declare variables for different data types (string,number, boolean, null, and undefined).

⇒ Log the values of the variables and their types to the console using `console.log()`.

JavaScript Operators

Theory Assignment

- **Question 1**: What are the different types of operators in JavaScript? Explain with examples.
  - Arithmetic operators
  - Assignment operators
  - Comparison operators
  - Logical operators
- **Question 2**: What is the difference between == and === in JavaScript?

Lab Assignment(Task)

Create a JavaScript program to perform the following:

- ⇒ Add, subtract, multiply, and divide two numbers using arithmetic operators.
- ⇒ Use comparison operators to check if two numbers are equal and if onenumber is greater than the other.
- ⇒ Use logical operators to check if both conditions (e.g., `a > 10` and `b < 5`)are true.

Control Flow (If-Else, Switch)

Theory Assignment

- **Question 1**: What is control flow in JavaScript? Explain how `if-else` statements work withan example.
- **Question 2**: Describe how `switch` statements work in JavaScript. When should you use a `switch` statement instead of `if-else`?

Lab Assignment

- ⇒ Task 1:

  Write a JavaScript program to check if a number is positive, negative, or zero usingan `if-else` statement.
- ⇒ Task 2:

  Create a JavaScript program using a `switch` statement to display the day of theweek based on the user input (e.g., 1 for Monday, 2 for Tuesday, etc.).

Loops (For, While, Do-While)

Theory Assignment

- **Question 1**: Explain the different types of loops in JavaScript (for, while, do-while). Provide abasic example of each.
- **Question 2**: What is the difference between a `while` loop and a `do-while` loop?

Lab Assignment

- ⇒ Task 1:

  Write a JavaScript program using a `for` loop to print numbers from 1 to 10.
- ⇒ Task 2:

  Create a JavaScript program that uses a `while` loop to sum all even numbers between 1 and 20.
- ⇒ Task 3:

  Write a `do-while` loop that continues to ask the user for input until they enter a number greater than 10.

Functions

Theory Assignment

- **Question 1**: What are functions in JavaScript? Explain the syntax for declaring and calling a function.
- **Question 2**: What is the difference between a function declaration and a function expression?
- **Question 3**: Discuss the concept of parameters and return values in functions.

Lab Assignment

⇒ Task 1:

Write a function `greetUser` that accepts a user's name as a parameter and displaysa greeting message (e.g., "Hello, John!").

⇒ Task 2:

Create a JavaScript function `calculateSum` that takes two numbers as parameters,adds them, and returns the result.

Arrays

Theory Assignment

- **Question 1**: What is an array in JavaScript? How do you declare and initialize an array?
- **Question 2**: Explain the methods `push()`, `pop()`, `shift()`, and `unshift()` used in arrays.

Lab Assignment

⇒ Task 1:

- Declare an array of fruits (`["apple", "banana", "cherry"]`). Use JavaScript to:
- Add a fruit to the end of the array.
- Remove the first fruit from the array.
- Log the modified array to the console.

⇒ Task 2:

- Write a program to find the sum of all elements in an array of numbers.

Objects

Theory Assignment

- **Question 1**: What is an object in JavaScript? How are objects different from arrays?
- **Question 2**: Explain how to access and update object properties using dot notation and bracket notation.

Lab Assignment

Task:

⇒ Create a JavaScript object `car` with properties `brand`, `model`, and `year`. UseJavaScript to:

- Access and print the car's brand and model.
- Update the `year` property.
- Add a new property `color` to the car object.

JavaScript Events

Theory Assignment

- **Question 1**: What are JavaScript events? Explain the role of event listeners.
- **Question 2**: How does the `addEventListener()` method work in JavaScript? Provide an example.

Lab Assignment

Task

⇒ Create a simple webpage with a button that, when clicked, displays an alert saying"Button clicked!" using JavaScript event listeners.

DOM Manipulation

Theory Assignment

- **Question 1**: What is the DOM (Document Object Model) in JavaScript? How does JavaScript interact with the DOM?
- **Question 2**: Explain the methods `getElementById()`, `getElementsByClassName()`,and `querySelector()` used to select elements from the DOM.

Lab Assignment

Task:

⇒ Create an HTML page with a paragraph (`<p>`) that displays "Hello, World!".

⇒ Use JavaScript to:

- Change the text inside the paragraph to "JavaScript is fun!".
- Change the color of the paragraph to blue.

JavaScript Timing Events (setTimeout, setInterval)

Theory Assignment

- **Question 1**: Explain the `setTimeout()` and `setInterval()` functions in JavaScript. Howare they used for timing events?
- **Question 2**: Provide an example of how to use `setTimeout()` to delay an action by 2 seconds.

Lab Assignment

⇒ Task 1:

- Write a program that changes the background color of a webpage after 5 secondsusing `setTimeout()`.

⇒ Task 2:

- Create a digital clock that updates every second using `setInterval()`.

JavaScript Error Handling

Theory Assignment

- **Question 1**: What is error handling in JavaScript? Explain the `try`, `catch`, and `finally` blocks with an example.
- **Question 2**: Why is error handling important in JavaScript applications?

Lab Assignment

Task:

- Write a JavaScript program that attempts to divide a number by zero. Use `try-catch` to handle the error and display an appropriate error message.