**Chapter 4**

**JavaScript**

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| **4.1** | **Basic of JavaScript** |
| **4.1.1** | **JavaScript Introduction** |
|  | JavaScript was initially designed for making pages ‘alive’  Script can be executed in browser itself  It can be Executed on the browser as well as server.  There are Language that get ‘transplied’ to JavaScript  JavaScript is a widely-used programming language that primarily runs in web browsers, allowing you to create interactive and dynamic websites. It's a versatile language that can also be used on the server-side (with technologies like Node.js) for building backend applications. |
| **4.1.2** | **Use Of JavaScript** |
|  | Web Development:  Interactive Webpages  DOM Manipulation  AJAX  Front-End Frameworks:  React  Angular  Vue.js  Back-End Development:  Node.js  Mobile App Development  Web APIs and Third-Party Integrations  Real-Time Applications  IoT (Internet of Things) |
| **4.1.3** | **Way to include javascript** |
|  | **1.Inline Script:** You can include JavaScript directly within the HTML element.  **2.Internal Script:** You can include JavaScript directly within the HTML document using the <script> tag. This is placed between the <head> or <body> tags of your HTML file.  **3. External Script File:** To keep your HTML and JavaScript code separate, you can create an external JavaScript file (with a .js extension) and include it using the <script> tag. |
| **4.1.4** | **Synatax of JavaScript** |
|  | The syntax of JavaScript is quite flexible and similar to other programming languages like C, C++, and Java. Here's an overview of the basic syntax elements:  **1.Comments:**  Js:  // This is a single-line comment  /\*  This is a multi-line comment  \*/  **2.Variables and Data Types:**  Js:  // Declare a variable  var name = "John";  // Modern variable declaration (ES6+)  let age = 25;  const PI = 3.14159;  // Data types  let num = 42; // Number  let str = "Hello"; // String  let bool = true; // Boolean  let arr = [1, 2, 3]; // Array  let obj = { // Object  key: "value",  age: 30  };  **3.Conditional Statements:**  Js:  if (condition) {  // Code to execute if condition is true  } else {  // Code to execute if condition is false  }  // Example using switch  switch (value) {  case 1:  // Code for case 1  break;  case 2:  // Code for case 2  break;  default:  // Code for other cases  }  **4.Loops:**  Js:  // For loop  for (let i = 0; i < 5; i++) {  // Code to repeat  }  // While loop  while (condition) {  // Code to repeat  }  // Do-while loop  do {  // Code to repeat  } while (condition);  // For…in loop (for objects)  for (let key in obj) {  // Access obj[key]  }  // For…of loop (for arrays, strings, etc.)  for (let item of arr) {  // Access item  }  **5.Functions:**  Js:  // Function declaration  function greet(name) {  return "Hello, " + name + "!";  }  // Function expression (anonymous function)  const add = function(x, y) {  return x + y;  };  // Arrow function (ES6+)  const multiply = (a, b) => a \* b;  **6.Arrays:**  Js:  let numbers = [1, 2, 3, 4, 5];  let fruits = [“apple”, “banana”, “orange”];  // Accessing array elements  let firstNumber = numbers[0];  // Array methods  numbers.push(6); // Add to end  numbers.pop(); // Remove from end  numbers.shift(); // Remove from start  numbers.unshift(0); // Add to start |
| **4.1.5** | **Basic event of javascript** |
|  | |  |  | | --- | --- | | onchange | An HTML element has been changed | | onclick | The user clicks an HTML element | | onmouseover | The user moves the mouse over an HTML element | | onmouseout | The user moves the mouse away from an HTML element | | onkeydown | The user pushes a keyboard key | | Onload  onblur  onfocus | The browser has finished loading the page  The onblur event occurs when an element loses focus  The onfocus event occurs when an element gains focus | |
| **4.1.6** | **Basic Validation with javascript** |
|  | Basic form validation in JavaScript involves checking user input to ensure it meets certain criteria before the form is submitted to the server.  if (username === "") {  alert("Username is required.");  } else if (email === "") {  alert("Email is required.");  } else if (password === "") {  alert("Password is required.");  } else {  alert("Registration successful!");  }  function isValidEmail(email) {      const emailPattern = /^[^\s@]+@[^\s@]+\.[^\s@]+$/;      return emailPattern.test(email);  }  if (isPositiveNumber(userInput)) {      console.log("Valid input!");  } else {      console.log("Invalid input. Please enter a positive number.");  } |