**// -----------------------------------------------**

**// 1. Comments**

**// -----------------------------------------------**

**// Single-line Comment Example**

**// This is a single-line comment**

**/\***

**Multi-line Comment Example**

**This is a multi-line comment**

**\*/**

**// -----------------------------------------------**

**// 2. Variables**

**// -----------------------------------------------**

**// 'var' Example**

**var firstName = "Ali"; // Can be re-declared and updated**

**// 'let' Example**

**let lastName = "Khan"; // Block-scoped, cannot be re-declared**

**// 'const' Example**

**const age = 25; // Block-scoped, cannot be updated**

**// age = 30; // Will throw an error**

**// -----------------------------------------------**

**// 3. Operators and Expressions**

**// -----------------------------------------------**

**let x = 10, y = 5;**

**// Arithmetic Operators**

**console.log(x + y); // Addition**

**console.log(x - y); // Subtraction**

**console.log(x \* y); // Multiplication**

**console.log(x / y); // Division**

**console.log(x % y); // Modulus**

**// Power Operator**

**let z = x \*\* 3; // x raised to the power of 3**

**console.log(z);**

**// Shorthand Properties**

**x += y; // x = x + y**

**x -= y; // x = x - y**

**// -----------------------------------------------**

**// 4. Increment and Decrement**

**// -----------------------------------------------**

**// Postfix Increment/Decrement**

**x++; // Increment x by 1 after using its value**

**y--; // Decrement y by 1 after using its value**

**// Prefix Increment/Decrement**

**++x; // Increment x by 1 before using its value**

**--y; // Decrement y by 1 before using its value**

**// -----------------------------------------------**

**// 5. Strings**

**// -----------------------------------------------**

**let str1 = "Hello \"World\""; // Escape double quotes**

**let str2 = 'It\'s a sunny day'; // Escape single quotes**

**// Template Literals**

**let name = "Ali";**

**console.log(`My name is ${name} and I am ${age} years old.`);**

**// -----------------------------------------------**

**// 6. Data Types**

**// -----------------------------------------------**

**let num = 42; // Number**

**let str = "Hello"; // String**

**let isTrue = true; // Boolean**

**let notDefined; // Undefined**

**let empty = null; // Null**

**// Type Checking**

**console.log(typeof num); // Output: 'number'**

**// -----------------------------------------------**

**// 7. Control Structures**

**// -----------------------------------------------**

**if (age >= 18) {**

**console.log("Eligible to vote");**

**} else {**

**console.log("Not eligible to vote");**

**}**

**// Nested If**

**if (age > 0) {**

**if (age < 18) {**

**console.log("Minor");**

**} else {**

**console.log("Adult");**

**}**

**}**

**// If-Else If Ladder**

**if (age > 60) {**

**console.log("Senior Citizen");**

**} else if (age > 18) {**

**console.log("Adult");**

**} else {**

**console.log("Minor");**

**}**

**// Ternary Operator**

**let status = age >= 18 ? "Adult" : "Minor";**

**console.log(status);**

**// Nullish Coalescing Operator**

**let defaultName = "Ali";**

**console.log(name ?? defaultName); // Outputs: Ali**

**// -----------------------------------------------**

**// 8. Switch Statement**

**// -----------------------------------------------**

**let day = 3;**

**switch (day) {**

**case 1:**

**console.log("Sunday");**

**break;**

**case 2:**

**console.log("Monday");**

**break;**

**case 3:**

**console.log("Tuesday");**

**break;**

**default:**

**console.log("Invalid day");**

**}**

**// -----------------------------------------------**

**// 9. String Operations**

**// -----------------------------------------------**

**// Concatenation**

**let greeting = "Hello" + " World!";**

**console.log(greeting);**

**// Multiline Strings**

**let multiline = `**

**Hello**

**World**

**`;**

**console.log(multiline);**

**// -----------------------------------------------**

**// 10. Functions**

**// -----------------------------------------------**

**// Traditional Function**

**function sum(a, b) {**

**return a + b;**

**}**

**console.log(sum(2, 3)); // Output: 5**

**// Arrow Functions**

**let square = a => a \* a;**

**console.log(square(4)); // Output: 16**

**// Anonymous Function**

**let greet = function () {**

**console.log("Welcome!");**

**};**

**greet();**

**// Immediately Invoked Function Expression (IIFE)**

**(function () {**

**console.log("IIFE executed!");**

**})();**

**// -----------------------------------------------**

**// 11. Loops**

**// -----------------------------------------------**

**// While Loop**

**let count = 0;**

**while (count < 3) {**

**console.log(count);**

**count++;**

**}**

**// Do-While Loop**

**do {**

**console.log(count);**

**count--;**

**} while (count > 0);**

**// For Loop**

**for (let i = 0; i < 3; i++) {**

**console.log(i);**

**}**

**// -----------------------------------------------**

**// 12. Array Iterative Methods**

**// -----------------------------------------------**

**const numbers = [1, 2, 3, 4, 5];**

**// Map**

**const squared = numbers.map(num => num \* num);**

**console.log(squared);**

**// Filter**

**const evens = numbers.filter(num => num % 2 === 0);**

**console.log(evens);**

**// Reduce**

**const sumTotal = numbers.reduce((acc, num) => acc + num, 0);**

**console.log(sumTotal);**

**// -----------------------------------------------**

**// 13. DOM Manipulation**

**// -----------------------------------------------**

**document.addEventListener("DOMContentLoaded", () => {**

**const para = document.createElement("p");**

**para.innerText = "Hello DOM!";**

**document.body.appendChild(para);**

**});**