Introduction to JavaScript

- JavaScript (JS) is a versatile programming language mainly used for creating interactive web applications.
- It runs in the browser and can also be used on the server with Node.js.
- It was created in 1995 and is now one of the core technologies of the web (alongside HTML and CSS).

JavaScript Basics

- Variables: Declared using var, let, const.
- Data Types: Number, String, Boolean, Object, Undefined, Null, Symbol, BigInt.
- Operators: Arithmetic (+, -, * , /), Comparison (==, ===, >, <), Logical (&&, ||, !).

Control Structures

- If-else: Executes code based on conditions.
- Switch: Used for multiple conditions.
- Loops: for, while, do-while, for...of, for...in.

Functions

- Function Declaration: function myFunc() {}
- Function Expression: const x = function() {}
- Arrow Functions: const x = () => {}
- Parameters & Return Values: Functions can take input and return results.

Objects & Arrays

- Objects: Collection of key-value pairs.
- Arrays: Ordered lists of values.
- Common Array Methods: push, pop, shift, unshift, map, filter, reduce.

DOM (Document Object Model)

- JavaScript can access and modify HTML elements.

- Methods: getElementById, querySelector, getElementsByClassName.

- Events: onclick, onmouseover, addEventListener.

ES6 Features

- Template Literals: Using backticks for string interpolation.
- Destructuring: Extracting values from arrays/objects.
- Spread & Rest Operators: `...` for spreading/collecting values.
- Modules: import and export keywords.
- Classes: Introduced for object-oriented programming.

Asynchronous JavaScript

- Callbacks: Functions passed as arguments.
- Promises: Handle async operations more cleanly.
- Async/Await: Simplifies working with promises.

Error Handling

- try...catch: Handles runtime errors.
- throw: Used to create custom errors.

JavaScript in Real Life

- Frontend: Used for animations, form validation, dynamic content.
- Backend: Node.js allows JS on the server.
- APIs: Fetch and manipulate external data.

Conclusion

- JavaScript is essential for modern web development.
- It powers both the frontend and backend of applications.
- Learning JS opens the door to frameworks like React, Angular, Vue, and Node.js.