JavaScript Documentation

Slide 1: Title Slide

Title: Comprehensive JavaScript Guide

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Slide 2: Introduction to JavaScript

- **What is JavaScript?**
- - JavaScript is a high-level, dynamic, untyped, and interpreted programming language.
- - It is an essential part of web development, enabling interactive web pages and enhancing user experience.
- - Initially created for client-side scripting, it has expanded to server-side applications (e.g., Node.js).

Key Characteristics:

- - **Interpreted Language**: JavaScript code is executed line by line.
- - **Event-driven**: JavaScript responds to user actions like clicks and keystrokes.
- - **Prototype-based**: JavaScript uses prototypes for inheritance rather than classes.
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Slide 3: JavaScript Syntax

- ***Basic Syntax:***
- - JavaScript is case-sensitive and uses a combination of keywords, operators, and punctuation to create statements.
- - **Statements**: Instructions that perform actions, ending with a semicolon.
- let x = 5; // Variable declaration and assignment

Comments:

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- - Use `//` for single-line comments and `/* ... */` for multi-line comments.
- // This is a single-line comment
- /*
- This is a
- multi-line comment
- */

Variables:*

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- Declared using `var`, `let`, or `const`.

let name = "Alice"; // Mutable variable

const age = 30; // Immutable variable

- ```

Slide 4: Data Types

- JavaScript has various data types, which are categorized as primitive and object types.
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- *****Primitive Data Types:*****
- 1. **String**: Represents text.
- let greeting = "Hello, World!";

Slide 4: Data Types

- 2. **Number**: Represents both integers and floating-point numbers.
- let score = 95.5;
- 3. **Boolean**: Represents a value of true or false.
- let isActive = true;
- ```
- 4. **Undefined**: Represents a variable that has been declared but not assigned a value.
- let myVar; // myVar is undefined
- ``` ```
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- 5. **Null**: Represents an intentional absence of value.
- let emptyValue = null;
- ```

Object Data Type:

- - Objects are collections of key-value pairs.
- let person = {
- name: "Alice",
- age: 30,
- isStudent: false,
- };

Slide 5: Control Structures

Control structures direct the flow of execution in JavaScript.

Conditional Statements:

- **if statement**: Executes code if a condition is true.

```
if (age >= 18) {
console.log("You are an adult.");
}
```

- **else statement**: Executes code if the condition is false.

```
console.log("You are a minor.");
}
```

- **switch statement**:

- **switch statement**: Selects one of many blocks of code to execute.

```
switch (day) {
case 1:
console.log("Monday");
break;
case 2:
console.log("Tuesday");
break;
default:
console.log("Another day");
}
```

Loops:

- **for loop**: Executes a block of code a specified number of times.

```
for (let i = 0; i < 5; i++) {
  console.log(i);
}
```

- **while loop**: Repeats as long as a specified condition is true.

```
let i = 0;
while (i < 5) {
  console.log(i);
  i++;
}
```

- **do...while loop**: Executes the block of code once before checking the condition.

```
do {
  console.log(i);
  i++;
} while (i < 5);
```

Slide 6: Functions

Slide 6: Functions

Functions are reusable blocks of code that perform a specific task.

Function Declaration:

function greet(name) {

- return "Hello, " + name + "!";
- }
- ```
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- **Function Expression:**
- - Functions can also be defined as expressions.
- const greet = function(name) {
- return "Hello, " + name + "!";
- };

- **Arrow Functions:**
- - A shorter syntax for writing functions introduced in ES6.
- const greet = (name) => `Hello, ${name}!`;
- ```
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- **Higher-Order Functions:**
- - Functions that can accept other functions as arguments or return functions.
- function applyFunction(fn, value) {
- return fn(value);
- }

Slide 7: Arrays

Arrays are ordered collections of values that can be of any type.

Creating Arrays:

let fruits = ["apple", "banana", "orange"];

****Array Methods:****

- **push()**: Adds an element to the end of the array.

  fruits.push("kiwi");

- **pop()**: Removes the last element of the array.

  let lastFruit = fruits.pop();

- **map()**: Creates a new array with the results of calling a provided function on every element.

  let upperFruits = fruits.map(fruit => fruit.toUpperCase());

- **filter()**: Creates a new array with elements that pass the provided condition.let longFruits = fruits.filter(fruit => fruit.length > 5);

Slide 8: Objects

- Objects are key-value pairs and can represent complex data structures.
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- **Creating Objects:**
- let car = {
- make: "Toyota",
- model: "Camry",
- year: 2020,
- };
- ```
-
- **Accessing Object Properties:**
- - Using dot notation:
- console.log(car.make); // Output: Toyota
- ```
- - Using bracket notation:
- console.log(car["model"]); // Output: Camry

Methods:

- - Functions can be stored as object properties.
- let person = {
- name: "Alice",
- greet() {
- console.log("Hello, " + this.name);
- },
- };
- person.greet(); // Output: Hello, Alice
- ```

Slide 9: DOM Manipulation

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- The Document Object Model (DOM) represents the structure of an HTML document and allows JavaScript to manipulate it.
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- ****Selecting Elements:****
- - **getElementById()**: Selects an element by its ID.
- let header = document.getElementById("header");
- - **querySelector()**: Selects the first matching element using a CSS selector.
- let firstButton = document.querySelector("button");
- ```

Modifying Elements:

- - *Changing text content:*
- header.textContent = "New Header Text";
- - *Changing styles:*
- header.style.color = "blue";
- ****Creating and Removing Elements:****
- - Creating a new element:
- let newElement = document.createElement("div");
- newElement.textContent = "This is a new div!";
- document.body.appendChild(newElement);
- ```
- - Removing an element:
- document.body.removeChild(newElement);

Slide 10: Event Handling

- JavaScript allows you to respond to user interactions through events.
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- **Adding Event Listeners:**
- - You can attach functions to elements to respond to specific events.
- button.addEventListener("click", function() {

alert("Button clicked!");

});

****Common Events:****

- - `click`, `mouseover`, `keyup`, `submit`, etc.

****Event Object:****

- - The event object provides information about the event.
- button.addEventListener("click", function(event) {

console.log(event.target); // Logs the element that triggered the event

});