Basic Syntax and Statements in JavaScript

This document provides an overview of the basic syntax and statements in JavaScript.

1. Variables

- **var**: Declares a variable, optionally initializing it to a value.
- **let**: Declares a block-scoped, local variable, optionally initializing it to a value.
- **const**: Declares a block-scoped, read-only constant.

```javascript
var x = 10;
let y = 20;
const z = 30;
```

2. Data Types

- **Number**: `let num = 5;`
- **String**: `let name = "John";`
- **Boolean**: `let isTrue = true;`
- **Array**: `let arr = [1, 2, 3];`
- **Object**: `let obj = {key: "value"};`
- **Undefined**: A variable that has not been assigned a value.
- **Null**: Represents the intentional absence of any object value.

3. Operators

- **Arithmetic Operators**: `+`, `-`, `*`, `/`, `%`
- **Assignment Operators**: `=`, `+=`, `-=`, `*=`, `/=`
- **Comparison Operators**: `==`, `===`, `!=`, `!==`, `>`, `<`, `>=`, `<=`
- **Logical Operators**: `&&`, `||`, `!`

4. Control Structures

if...else Statement
```javascript
let age = 20;
if (age >= 18) {
   console.log("You are an adult.");
} else {
   console.log("You are a minor.");
}
```

switch Statement
```javascript
let day = 3;
switch (day) {
  case 1:
    console.log("Monday");
    break;
  case 2:
    console.log("Tuesday");
    break;
  case 3:
    console.log("Wednesday");
    break;
  default:
    console.log("Another day");
}
```

5. Loops

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

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

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

6. Functions

Function Declaration
```javascript
function greet(name) {
    return "Hello, " + name;
}
console.log(greet("Alice"));
```

Function Expression
```javascript
const greet = function(name) {
    return "Hello, " + name;
}
console.log(greet("Bob"));
```

Arrow Functions
```javascript
const greet = (name) => {
    return "Hello, " + name;
}
console.log(greet("Charlie"));
```

7. Objects and Arrays

Object
```javascript
let person = {
    name: "John",
    age: 30,
    greet: function() {
        console.log("Hello, " + this.name);
    }
};
person.greet();
```

Array
```javascript
let colors = ["red", "green", "blue"];
console.log(colors[0]);  // Output: red
```

Example: Combining Concepts

```javascript
const person = {
  firstName: "John",
  lastName: "Doe",
  age: 25,
  fullName: function() {
    return this.firstName + " " + this.lastName;
  }
};

let people = ["Alice", "Bob", "Charlie"];

for (let i = 0; i < people.length; i++) {
  console.log("Hello, " + people[i]);
}

if (person.age > 18) {
  console.log(person.fullName() + " is an adult.");
} else {
  console.log(person.fullName() + " is a minor.");
}
```