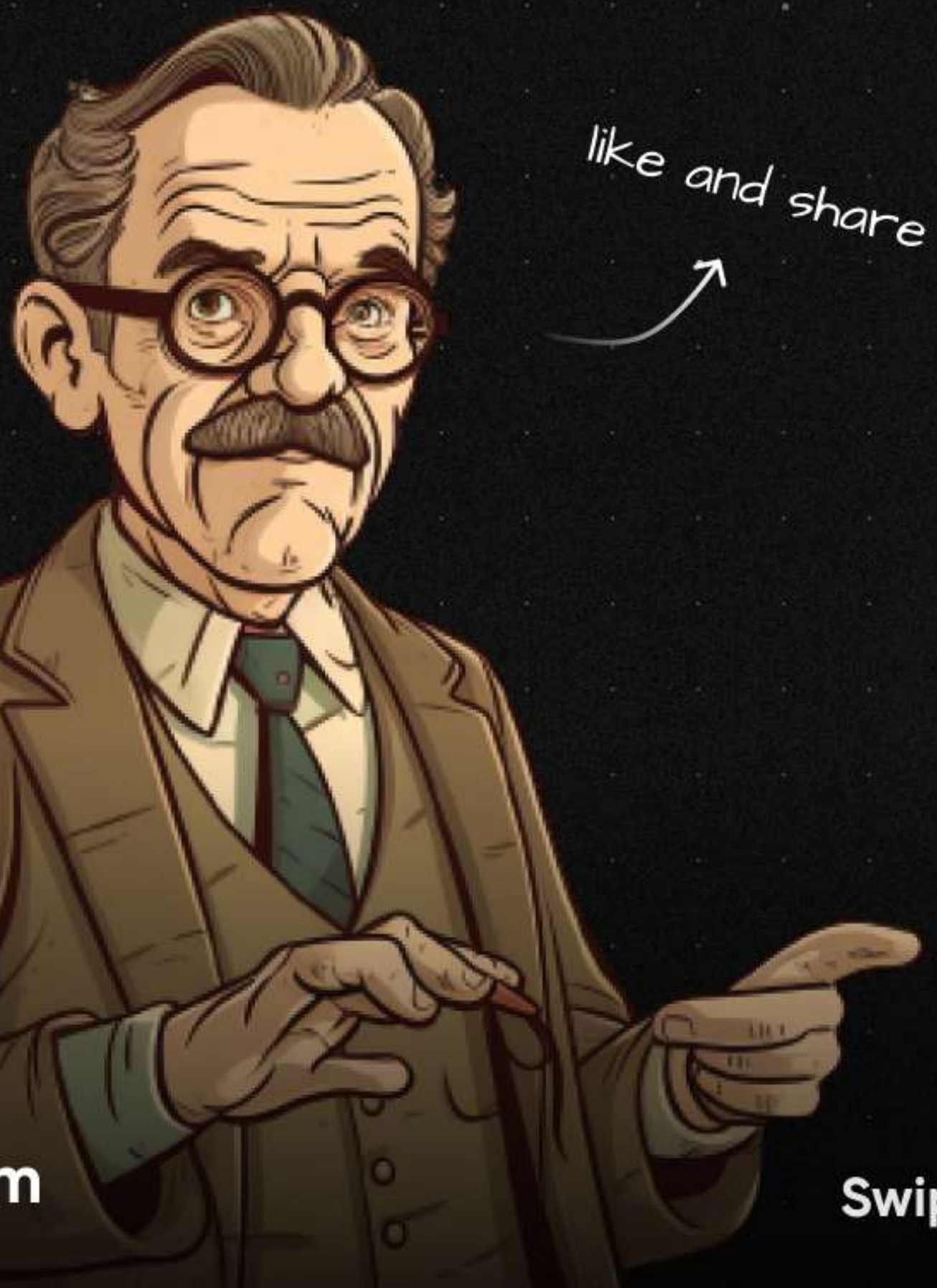
Concepts that every JS developer should know



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Variables and Data Types

Variables are named containers that hold values, and data types define the kind of values they can hold (e.g., strings, numbers, boolean).

```
let name = "John";
let age = 30;
let isStudent = true;
```

String variable

Number variable

Boolean variable

Control Flow

Control flow determines the order of statement execution based on conditions, loops, or switches.

```
let score = 85;

if (score >= 90) {
  console.log("Excellent!");
} else if (score >= 70) {
  console.log("Good job!");
} else {
  console.log("Keep practicing.");
}
```

"Good job!"

Output

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Functions

Functions are blocks of code that perform specific tasks and can take arguments and return values.

```
function addNumbers(num1, num2) {
  return num1 + num2;
}

let result = addNumbers(5, 10);
```

logged result will be 15

Arrays and Lists

Arrays and lists store collections of values; arrays have fixed size, while lists are dynamic.

```
let fruits = ["apple", "banana", "orange"];
fruits.push("grape");
console.log(fruits[0]);
```

Adding "grape" to the array

Output: "apple"

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Object-Oriented Programming

OOP emphasizes using objects (instances of classes) to encapsulate data and behavior.

```
class Dog {
  constructor(name, age) {
    this.name = name;
    this.age = age;
  }

  bark() {
    console.log("Woof!");
  }
}

let dog1 = new Dog("Buddy", 3);
dog1.bark();
```

Output: "Woof!"

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Debugging

Debugging involves identifying and fixing errors in the code.

```
function divide(a, b) {
  if (b === 0) {
    console.error("Cannot divide by zero.");
    return;
  }
  return a / b;
}

console.log(divide(10, 0));
```

Output: "Cannot divide by zero."

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Memory Management

Memory management is about allocating and freeing up memory properly.

```
my_list = [1, 2, 3, 4, 5]

my_list.append(6)

print(my_list)

my_list = None
```

Creating a list and allocating memory for it

Modifying the list and allocating additional memory

Once printed, releasing the memory by removing the list reference

Algorithms and Data Structures

Algorithms are sets of steps to solve problems, and data structures organize and store data efficiently.

```
let numbers = [5, 2, 8, 1, 9];
numbers.sort((a, b) => a - b);
console.log(numbers);
```

Output: "[1, 2, 5, 8, 9]"

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APIs and Web Services

APIs are sets of rules enabling different software applications to communicate and interact with each other.

Example: Making an API call to retrieve data from a weather service.

```
fetch('https://api.weather.com/data', {
  method: 'GET',
  headers: {
    'API-Key': 'your_api_key_here'
  }
})
.then(response => response.json())
.then(data => console.log(data));
```

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