Here are conceptual examples that demonstrate different aspects of working with strings in JavaScript:

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1. Declaring Strings

Single and Double Quotes

```javascript
let singleQuoteString = 'Hello, World!';
let doubleQuoteString = "Hello, World!";
console.log(singleQuoteString === doubleQuoteString);
// Output: true
```

Template Literals

- Use backticks (`` ` ``) for multi-line strings or embedding expressions.

```javascript
let name = "Alice";
let greeting = `Hello, ${name}! Welcome to JavaScript.`;
console.log(greeting);
// Output: "Hello, Alice! Welcome to JavaScript."
```

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2. String Properties

Length of a String

```javascript
let message = "Hello, JavaScript!";
console.log(message.length); // Output: 18
```

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3. String Methods

Accessing Characters

```javascript
let word = "JavaScript";
```

```javascript
console.log(word[0]); // Output: "J"
console.log(word.charAt(4)); // Output: "S"
```

Changing Case

```javascript
let text = "Hello, World!";
console.log(text.toUpperCase()); // Output: "HELLO, WORLD!"
console.log(text.toLowerCase()); // Output: "hello, world!"
```

Trimming Whitespaces

```javascript
let padded = "   Hello, World!   ";
console.log(padded.trim()); // Output: "Hello, World!"
```

Searching Strings

```javascript
let sentence = "JavaScript is amazing!";
console.log(sentence.indexOf("is")); // Output: 11
console.log(sentence.includes("amazing")); // Output: true
```

Extracting Substrings

```javascript
let phrase = "Learning JavaScript";
console.log(phrase.slice(0, 8)); // Output: "Learning"
console.log(phrase.substring(9)); // Output: "JavaScript"
console.log(phrase.substr(9, 4)); // Output: "Java"
```

Replacing Content

```javascript
let msg = "I like Python!";
let updatedMsg = msg.replace("Python", "JavaScript");
console.log(updatedMsg); // Output: "I like JavaScript!"
```

Splitting Strings

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

4. Concatenation

Using + Operator

```javascript
let firstName = "Alice";
let lastName = "Doe";
console.log(firstName + " " + lastName); // Output: "Alice Doe"
```

Using Template Literals

```javascript
let age = 25;
console.log(`I am ${age} years old.`); // Output:"I am 25 years
old."
```

5. Iterating Over Strings

```javascript
let str = "Hello";
for (let char of str) {
  console.log(char); // Output: H, e, l, l, o
}
```

6. String Comparisons

```javascript
let str1 = "apple";
let str2 = "banana";
```

```
    console.log(str1 < str2); // Output: true (based on
lexicographical order)
```

7. Escape Characters

```
  let escapedString = 'She said, "It\'s a sunny day!"';
  console.log(escapedString); // Output: She said, "It's a sunny
day!"
```

8. Converting Other Data Types to Strings

Using `String()`

```
  let num = 42;
  console.log(String(num)); // Output: "42"
```

Using `.toString()`

```
  let booleanValue = true;
  console.log(booleanValue.toString()); // Output: "true"
```

9. Template Literal Use Cases

Multi-line Strings

```
  let multiline = `This is line 1
This is line 2
This is line 3`;
  console.log(multiline);
  /* Output:
  This is line 1
  This is line 2
```

```
  This is line 3
 */
```

Embedding Expressions

```
  let a = 5;
  let b = 10;
  console.log(`The sum of ${a} and ${b} is ${a + b}.`); // Output:
"The sum of 5 and 10 is 15."
```

10. Advanced Examples

Reversing a String

```
  let original = "JavaScript";
  let reversed = original.split("").reverse().join("");
  console.log(reversed); // Output: "tpircSavaJ"
```

Counting Vowels in a String

```
  let str = "JavaScript is fun!";
  let vowels = str.match(/[aeiou]/gi);
  console.log(vowels.length); // Output: 5
```

Removing All Non-Alphanumeric Characters

```
  let messyString = "Hello, World! @2025";
  let cleaned = messyString.replace(/[^a-z0-9]/gi, "");
  console.log(cleaned); // Output: "HelloWorld2025"
```

Would you like deeper explanations, or code challenges for any of these?