Task: Monoalphabetic Decryption
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Monoalphabetic Decryption in JavaScript

How It Works

The code implements a **monoalphabetic substitution cipher** where each character is mapped to another randomly shuffled character. The encryption process uses this shuffled mapping to replace each character, and decryption reverses it using a **reverse key map**

Example of the Code

Generating the Key Map

The function `generateShuffledKeyMap()` creates a shuffled mapping of characters based on ASCII values 0 to 255.

```
function generateShuffledKeyMap() {
    let chars = [];
    for (let i = 0; i < 256; i++) chars.push(String.fromCharCode(i));
```

```
    // Shuffle using a simple loop
    for (let i = chars.length - 1; i > 0; i--) {
        let j = Math.floor(Math.random() * (i + 1));
        [chars[i], chars[j]] = [chars[j], chars[i]]; // Swap elements
    }

    let keyMap = {};
    for (let i = 0; i < 256; i++) {
        keyMap[String.fromCharCode(i)] = chars[i];
    }
    return keyMap;
}
```

Decryption Process

The function `monoalphabeticDecrypt(text, keyMap)` reverses the encryption by mapping shuffled characters back to their original form.

```
function monoalphabeticDecrypt(text, keyMap) {
    let reverseKeyMap = {};
    for (let key in keyMap) {
        reverseKeyMap[keyMap[key]] = key;
    }
    let result = "";
    for (let char of text) {
        result += reverseKeyMap[char] || char;
    }
    return result;
}
```

- **A reverse mapping is created by swapping the key-value pairs in `keyMap`.**
- **The function iterates over the encrypted text and replaces each character with its original counterpart.**
- **If a character is not found in the map, it remains unchanged.**

Implementation Example

let keyMap = generateShuffledKeyMap(); // Generate key mapping

let encrypted = ""; // Assume some encrypted text

let decrypted = monoalphabeticDecrypt(encrypted, keyMap);
console.log("Decrypted:", decrypted);

same key map used for encryption must be available for decryption

Web UI

"I create web UI using React.js for all tasks. Here is the link where you can test it."

`https://data-information-security-4stage.vercel.app`