Database Design Document

Overview

For this application, I am using **Dexie.js** as the database technology to store user-specific calculation results locally. This setup allows for quick data persistence and retrieval without the need for an external server, aligning with the app's need to store small amounts of structured data effectively. By leveraging Dexie.js, the application can maintain performance while providing users with an intuitive experience in managing their calculations.

Data Specifications

- **Database:** ElectroShockDB
- **Tables:** Calculations

1. Calculations Table

The **Calculations** table logs the equations saved by each user, enabling them to revisit their previous calculations. This table is crucial for allowing users to track their calculation history and retrieve results as needed.

Table Structure:

Column Name	Data Type	Description
id	INTEGER	Primary key, auto-incremented unique identifier
type	TEXT	Type of calculation (e.g., "Ohm's Law")
voltage	TEXT	Voltage value entered by the user
current	TEXT	Current value entered by the user
resistance	TEXT	Resistance value entered by the user
result	TEXT	Result of the calculation
calculated_at	TEXT	Timestamp for when the calculation was saved

Sample Data:

id	type	voltage	current	resistance	result	calculated_at
1	Ohm's Law	120	20	6	Voltage (V) = 120 V	2024-11-03T12:00:00
2	Ohm's Law	240	10	24	Voltage (V) = 240 V	2024-11-03T12:05:00

2. Purpose, Implementation, and Interactions

Calculations Table

- **Purpose**: The **Calculations** table serves as the primary storage for user-generated calculation data. It allows users to save their calculations for future reference, providing a means to access past results conveniently.
- **Implementation**: Each calculation performed by the user is stored in the table with a timestamp, allowing the application to display the history of a user's calculations in chronological order. This facilitates a structured approach to data management without cluttering the user interface.
- **Interaction**: Users can view their calculation history on a dedicated page within the application. Each entry is fetched directly from the calculations table in Dexie.js, ensuring real-time updates and a smooth user experience. The application can provide functionality for users to save, retrieve, and manage their calculation history effectively.

Future Enhancements

As the application evolves, additional features could include:

- **User Accounts**: Implementing user authentication to allow multiple users to manage their own calculation histories securely.
- **Editing and Deleting**: Enabling users to edit or delete previous calculations, providing greater control over their stored data.
- **Data Export**: Allowing users to export their calculation history as a CSV or PDF for external use.

Ohms Law Calculator

Voltage (V)
Enter Voltage

Current (I)
Enter Current

Resistance (R)
Enter Resistance

CALCULATE VOLTAGE