

Overview

For this application, I am using **Dexie.js** as the database 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.

Service Endpoints

Given that this application will operate with a local database (IndexedDB), the service layer will encapsulate the interaction with the Dexie.js database, providing a set of operations that the user interface can call. Here are the service endpoints that will be exposed:

1. Add Calculation

- **Endpoint:** POST /calculations
- **Description:** Saves a new calculation to the database.
- **Request Body:**

json

Copy code

```
{
  "type": "Ohm's Law",
  "voltage": "120",
  "current": "20",
  "resistance": "6",
  "result": "Voltage (V) = 120 V"
}
```

- **Response:**

json

Copy code

```
{
  "id": 1,
  "message": "Calculation saved successfully."
}
```

- **Error Response:**

json

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```
{  
  "error": "Failed to save calculation."  
}
```

2. Get All Calculations

- **Endpoint:** GET /calculations
- **Description:** Retrieves all saved calculations from the database.
- **Response:**

json

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```
[  
  {  
    "id": 1,  
    "type": "Ohm's Law",  
    "voltage": "120",  
    "current": "20",  
    "resistance": "6",  
    "result": "Voltage (V) = 120 V",  
    "calculated_at": "2024-11-03T12:00:00"  
  },  
  ...  
]
```

- **Error Response:**

json

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```
{  
  "error": "No calculations found."  
}
```

3. Get Last Calculation

- **Endpoint:** GET /calculations/last
- **Description:** Retrieves the last saved calculation from the database.
- **Response:**

json

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```
{  
  "id": 1,  
  "type": "Ohm's Law",  
  "voltage": "120",  
  "current": "20",  
  "resistance": "6",  
  "result": "Voltage (V) = 120 V",  
  "calculated_at": "2024-11-03T12:00:00"  
}
```

- **Error Response:**

json

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```
{  
  "error": "No calculations available."  
}
```

Purpose, Implementation, and Interactions

Calculations Service

- **Purpose:** Manages all calculations performed by the user, enabling them to save and retrieve their previous calculations.
- **Implementation:** Uses Dexie.js to interface with IndexedDB, allowing quick access to calculation data stored locally in the user's browser.
- **Interaction:** The user interface will call these service methods when the user performs calculations, saves results, or wants to review past calculations. Each call will interact with the appropriate Dexie.js methods to handle data operations.

Diagram

A diagram should be created showing how the user interface pages will interact with these service endpoints. This could be a simple flowchart that maps out which UI actions lead to which service method calls, ensuring a clear understanding of the application's architecture.