Updated Service Endpoints

1. User Registration

- Endpoint: POST /users/register
- Description: Registers a new user in the application.
- Request Body:

```json
Copy code
{
  "username": "cfreeman",
  "email": "cfreeman@email.com",
  "password": "password123"
}
```

- Response:

```json
Copy code
{
  "id": 1,
  "message": "User registered successfully."
}
```

- Error Response:

```json
Copy code
{
  "error": "User registration failed."
}
```

2. User Login

- Endpoint: POST /users/login
- Description: Authenticates a user and returns session data.
- Request Body:

```json
Copy code
{
  "username": "cfreeman",
  "password": "password123"
}
```

- Response:

```json
Copy code
{
```

```json
  "user_id": 1,
  "message": "Login successful."
}
```

- Error Response:

```json
Copy code
{
  "error": "Invalid username or password."
}
```

3. Add Calculation

- Endpoint: POST /calculations
- Description: Saves a new calculation for the authenticated user.
- Request Body:

```json
Copy code
{
  "user_id": 1,
  "type": "Ohm's Law",
  "voltage": "120",
  "current": "10",
  "resistance": "12",
  "result": "Voltage (V) = 120 V"
}
```

- Response:

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

- Error Response:

```json
Copy code
{
  "error": "Failed to save calculation."
}
```

4. Get All Calculations

- Endpoint: GET /calculations
- Description: Retrieves all calculations for the authenticated user.
- Response:

```json
Copy code
[
  {
    "id": 1,
    "type": "Ohm's Law",
    "voltage": "120",
    "current": "10",
    "resistance": "12",
    "result": "Voltage (V) = 120 V",
    "calculated_at": "2024-11-09T12:00:00"
  }
]
```

- Error Response:

```json
Copy code
{
  "error": "No calculations found."
}
```

5. Get Last Calculation

- Endpoint: GET /calculations/last
- Description: Retrieves the most recent calculation for the authenticated user.
- Response:

```json
Copy code
{
  "id": 1,
  "type": "Ohm's Law",
  "voltage": "120",
  "current": "10",
  "resistance": "12",
  "result": "Voltage (V) = 120 V",
  "calculated_at": "2024-11-09T12:00:00"
}
```

- Error Response:

```json
Copy code
{
  "error": "No calculations available."
}
```

6. Mark Calculation as Favorite

- Endpoint: POST /favorites
- Description: Marks a specific calculation as a favorite.

- Request Body:

```json
Copy code
{
  "user_id": 1,
  "calculation_id": 1
}
```

- Response:

```json
Copy code
{
  "message": "Calculation marked as favorite."
}
```

- Error Response:

```json
Copy code
{
  "error": "Failed to mark as favorite."
}
```

7. Get All Favorites

- Endpoint: GET /favorites
- Description: Retrieves all favorited calculations for the authenticated user.
- Response:

```json
Copy code
[
  {
    "id": 1,
    "calculation_id": 1,
    "favorited_at": "2024-11-09T12:10:00"
  }
]
```

- Error Response:

```json
Copy code
{
  "error": "No favorites found."
}
```

8. Data Export

- Endpoint: GET /export

- Description: Exports the user's calculation history as a CSV file.
- Response:

```json
Copy code
{
  "message": "Data export initiated."
}
```

- Error Response:

```json
Copy code
{
  "error": "Failed to export data."
}
```

9. Analytics

- Endpoint: GET /analytics
- Description: Provides insights on user activity, such as the most frequently used calculation type.
- Response:

```json
Copy code
{
  "most_used_type": "Ohm's Law",
  "calculation_count": 50
}
```

- Error Response:

```json
Copy code
{
  "error": "Unable to retrieve analytics."
}
```

Purpose, Implementation, and Interactions

- **User Management:** The service layer handles user registration, login, and session management, allowing personalized experiences and data security.
- **Calculation Management:** Provides CRUD operations for user calculations, enabling users to save, view, edit, and delete their work.
- **Favorites:** Allows users to mark and retrieve favorite calculations for quick access.
- **Data Export and Analytics:** Enhances user experience by offering export options and activity insights.