Steps to Start Writing the Code from Scratch

Here's how you can systematically approach building your Library Management System with the JavaScript functionality you've outlined.

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1. Understand the Core Requirements

- **Proxy Management**: Use JavaScript Proxy to manage and validate book status.
- **Lending Durations**: Track book lending durations using closures.
- **Dynamic Rendering**: Fetch books from an API and dynamically render the library.
- **User Interaction**: Add, lend, and return books with status updates.

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2. Plan the Code Structure

Divide your functionality into these core modules:

- **Proxy for Book Validation**: Ensure valid book status updates using Proxy.
- **Lending Tracker**: Use closures to track lending durations.
- **API Integration**: Fetch initial book data dynamically.
- **Dynamic Rendering**: Update the DOM to reflect book operations.
- **User Interaction**: Handle lending, returning, and adding books.

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3. Set Up Proxy for Book Management

- Define the `createLibraryProxy` function to validate and manage book statuses.
- Ensure only valid statuses (`Available`, `Lent Out`) are allowed.

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4. Implement Lending Tracker

- Use closures to manage a `Map` of book IDs and their lending start times.
- Provide methods to:
    - Start tracking when a book is lent.
    - Stop tracking and calculate duration when a book is returned.

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5. Fetch Books Dynamically

- Write an `async` function to fetch book data from an external API (e.g., OpenLibrary).
- Transform the fetched data into book objects with:
    - Title, Author, and Status properties.
    - A unique ID.
    - Proxy applied for status validation.
- Render the books dynamically after fetching.

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6. Render Books

- Create a `renderBooks` function to:
    - Clear the existing DOM content.
    - Iterate over the `library` array and create DOM elements for each book.
    - Include buttons for lending and returning books.

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7. Add, Lend, and Return Books

- **Add Books**:
    - Create a new book object with user-provided Title and Author.
    - Apply the Proxy for validation.
    - Push the book to the `library` array and re-render.
- **Lend Books**:
    - Check if the book is available.
    - Update the status to `Lent Out` and start the lending tracker.
    - Re-render the library.
- **Return Books**:
    - Check if the book is lent out.
    - Update the status to `Available` and stop the lending tracker.
    - Alert the user with the lending duration.
    - Re-render the library.

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8. Test and Debug

- Test the following scenarios:
    - Adding books with valid and invalid inputs.
    - Lending available books.
    - Returning lent books and checking the duration.

    - Fetching and rendering books from the API.
- Debug issues using `console.log` and browser dev tools.

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9. Optimize Code

- Modularize the code by separating concerns into functions.
- Add meaningful comments to improve readability.
- Ensure proper error handling for API calls and user interactions.

Suggested Order to Write the Code

1. **Initialize Proxy Setup for Book Management**
2. **Implement Lending Tracker Using Closures**
3. **Fetch and Render Books Dynamically**
4. **Add Book Functionality**
5. **Lend and Return Book Functionality**
6. **Test and Debug**

Tools to Assist

- **Console Logs**: Debug Proxy, lending tracker, and rendering logic.
- **Browser DevTools**: Inspect API responses, DOM updates, and error messages.

By following this structured approach, you'll create a robust Library Management System that effectively tracks and manages book lending operations. Let me know if you need further assistance!