Steps to Start Writing the Code from Scratch

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

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1. Understand the Core Requirements

- **IndexedDB Setup**: Store and persist product data using IndexedDB.
- **Proxy Validation**: Use a Proxy to validate stock quantities.
- **Dynamic Rendering**: Display inventory data dynamically and update the UI as needed.
- **User Interaction**: Add, update, and remove products with proper validations.

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2. Plan the Code Structure

Divide your functionality into these core modules:

- **Database Setup**: Initialize and configure IndexedDB.
- **Proxy for Validation**: Enforce rules for product quantity.
- **Inventory Management**: Add, update, and remove products.
- **Rendering**: Update the UI dynamically based on inventory data.
- **Fetch and Save Data**: Fetch inventory data from a server and save new products locally.

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3. Set Up IndexedDB

- Use `indexedDB.open` to create a database named "InventoryDB" with an object store named `products`.
- Set `id` as the keyPath and enable auto-increment.
- Write utility functions to:
  - Save products to the database.
  - Fetch and load products into the inventory array on initialization.

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4. Implement Proxy for Validation

- Create a `createInventoryProxy` function that:

    - Validates the `quantity` property to ensure it is non-negative.
    - Throws an error for invalid updates.
- Apply the Proxy to all inventory products.

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5. Fetch and Load Inventory

- Write an `async` function to fetch product data from an API.
- Transform the fetched data into Proxy-wrapped product objects.
- Load the transformed data into the `inventory` array and render it.

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6. Add Products

- Attach an event listener to the "Add Product" button.
- Validate user inputs for product name and quantity.
- Create a new product object using the Proxy.
- Add the new product to the inventory array and save it to IndexedDB.
- Re-render the product list dynamically.

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7. Update and Remove Products

- **Update Quantity**:
    - Write an `updateProduct` function to:
        - Find the product by ID.
        - Increase or decrease the quantity based on user action.
        - Re-render the inventory list.
- **Remove Product**:
    - Write a `removeProduct` function to:
        - Filter the product out of the inventory array by ID.
        - Re-render the inventory list.

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8. Render Inventory

- Create a `renderInventory` function to dynamically update the DOM.
- Iterate over the `inventory` array and create elements for each product.
- Add buttons for increasing, decreasing, and removing products.

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9. Test and Debug

- Test the following scenarios:
    - Adding products with valid and invalid inputs.
    - Increasing and decreasing product quantities.
    - Removing products from the inventory.
    - Loading and rendering products on initialization.
- Debug issues using `console.log` and browser dev tools.

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10. Optimize the Code

- Modularize functionality into reusable functions.
- Add meaningful comments for better readability.
- Ensure proper error handling for API calls and user inputs.

Suggested Order to Write the Code

1. **Initialize IndexedDB**
2. **Implement Proxy for Validation**
3. **Fetch and Load Inventory Data**
4. **Add Product Functionality**
5. **Update and Remove Products**
6. **Render Inventory Dynamically**
7. **Test and Debug**

Tools to Assist

- **Console Logs**: Debug IndexedDB operations and inventory updates.
- **Browser DevTools**: Inspect IndexedDB, DOM elements, and network requests.

By following this structured approach, you’ll create a robust Inventory Management System with dynamic and persistent features. Let me know if you need further assistance!