The requirements for an e-commerce application using Vue 3, Vue Router, and Pinia. This will give you a clear idea of what features and functionalities to include in your project.

**E-commerce App Requirements**

**1. User Management**

* **User Registration**: Allow users to create an account with email and password.
* **User Login**: Provide a login form for existing users.
* **User Profile**: Enable users to view and update their profile information.
* **User Authentication**: Implement authentication to protect user-specific routes (e.g., profile, order history).

**2. Product Management**

* **Product Listing**: Display a list of products with images, names, prices, and descriptions.
* **Product Categories**: Organize products into categories and subcategories.
* **Product Details**: Show detailed information about a product, including reviews and ratings.
* **Search and Filter**: Allow users to search for products and apply filters (e.g., price range, category).

**3. Shopping Cart**

* **Add to Cart**: Enable users to add products to their shopping cart.
* **View Cart**: Provide a cart view where users can see the items they've added, update quantities, and remove items.
* **Cart Persistence**: Save the cart items across sessions (e.g., using local storage).

**4. Checkout Process**

* **Billing and Shipping Information**: Collect user information for billing and shipping.
* **Order Summary**: Display a summary of the order before final confirmation.
* **Order Confirmation**: Send an order confirmation email to the user with the order details.

**5. Order Management**

* **Order History**: Allow users to view their past orders and track the status of current orders.
* **Order Details**: Show detailed information about each order, including items purchased, prices, and shipping status.

**6. Admin Panel**

* **Product Management**: Allow admins to add, update, and delete products.
* **Order Management**: Provide an interface for admins to view and manage orders.
* **User Management**: Enable admins to manage user accounts (e.g., deactivate accounts, reset passwords).

**7. State Management with Pinia**

* **Global State**: Use Pinia to manage global state, such as user information, cart items, and product data.
* **Modular Stores**: Organize state management into modules (e.g., userStore, productStore, cartStore).

**8. Routing with Vue Router**

* **Public Routes**: Set up routes for public pages (e.g., home, product listing, product details, login, registration).
* **Protected Routes**: Protect routes that require authentication (e.g., profile, order history, admin panel).
* **Dynamic Routing**: Use dynamic routing for product details and categories.

**9. Responsive Design**

* **Mobile-Friendly**: Ensure the application is responsive and works well on mobile devices.
* **Cross-Browser Compatibility**: Test and ensure compatibility across different browsers.

**Project Structure**

* **src/components**: Reusable UI components (e.g., ProductCard, Navbar, Footer).
* **src/views**: Page components (e.g., Home, ProductList, ProductDetail, Cart, Checkout, Profile, Admin).
* **src/router**: Vue Router configuration and routes.
* **src/store**: Pinia stores for managing state.
* **src/services**: API services for interacting with backend endpoints.
* **src/assets**: Static assets like images and styles.

This comprehensive outline should help you design and develop a feature-rich e-commerce application using Vue 3, Vue Router, and Pinia.