Prerequisites for Developing Post Management System

To successfully develop the provided post management system, the following technical prerequisites are required:

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1. Technical Skills

Core JavaScript Concepts

1. **Data Structures**:
    - Working with arrays (`push`, `find`, `filter`, `map`).
    - Understanding objects for storing post data (e.g., `id`, `content`, `likes`, `comments`, `editHistory`).
2. **ES6 Features**:
    - Arrow functions.
    - Template literals for dynamic HTML rendering.
    - Destructuring (optional for cleaner code).
3. **DOM Manipulation**:
    - Selecting elements using `getElementById`, `querySelector`.
    - Dynamically creating, appending, and clearing elements (`createElement`, `appendChild`, `innerHTML`).
4. **Event Handling**:
    - Adding listeners for user actions like button clicks and input changes.
5. **Async Programming**:
    - Implementing throttling for search functionality.
6. **Error Handling**:
    - Validating user input (e.g., empty content or comments).
    - Safely handling scenarios where posts or IDs might not exist.

Frontend Design & Logic

- **CSS Knowledge**:
    - Styling classes for buttons, inputs, and containers.
    - Using utility-based frameworks like **Tailwind CSS** (used in the code).

- **Post Rendering**:
    - Dynamic creation of post elements.
    - Efficient rendering of filtered posts during search.

Performance Optimization

- **Throttling**:
    - Managing search frequency to improve performance and user experience.

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2. Code Structure Requirements

Encapsulation

- Encapsulate all post-related logic in a reusable `createPostManager` function.

Utility Functions

- Reuse common operations (e.g., rendering posts, adding comments).

Separation of Concerns

- Separate post management logic (add, edit, like, search) from DOM rendering.

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3. Key Functional Features

Post Operations

- **Add Post**:
    - Generate a unique `id` for each post using `Date.now()`.
    - Store content, likes, and comments in the post object.
- **Edit Post**:
    - Maintain an `editHistory` array to store previous content.
- **Like Post**:
    - Increment the `likes` count for a specific post.
- **Comment on Post**:
    - Append comments to the `comments` array for the respective post.

Search Functionality

- Filter posts based on a keyword (case-insensitive).
- Render only the matching posts.

Real-Time Rendering

- Dynamically update the feed when posts are added, edited, liked, or commented on.

Throttling

- Limit the number of search calls using a throttle mechanism.

UI Elements

- Buttons for liking, editing, and adding posts or comments.
- Text areas for entering content or comments.
- A search bar for filtering posts.

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4. Testing & Debugging

Functional Testing

- Test each action (add, edit, like, comment, search) independently.
- Test edge cases like:
    - Empty post content or comment.
    - Editing or liking a post that doesn't exist.

Cross-Browser Compatibility

- Test the application across modern browsers (e.g., Chrome, Firefox, Edge).

Error Handling

- Ensure meaningful messages or behavior in case of invalid operations.

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5. Advanced Features (Optional Enhancements)

Pagination

- Add pagination for managing large numbers of posts.

Post Persistence

- Use `localStorage` to save posts and reload them on page refresh.

Post Deletion

- Add a feature to delete a post along with its comments.

UI Enhancements

- Add animations for dynamic post rendering.
- Highlight posts that match the search query.

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6. Development Plan

1. **Setup Core Post Management Logic**:
    - Implement `addPost`, `editPost`, `likePost`, `addComment`, and `searchPosts`.
2. **Build the Rendering Logic**:
    - Dynamically render posts and update them based on operations.
3. **Add Event Listeners**:
    - Wire up buttons and input fields for user interactions.
4. **Optimize with Throttling**:
    - Ensure smooth search functionality with throttling.
5. **Test Each Feature**:
    - Verify all operations and edge cases.

By meeting these prerequisites and adhering to the outlined development plan, the post management system can be effectively developed and maintained. Let me know if you need further guidance!