Fire Extinguisher Manager App – Algorithm

# 1. App Initialization

- The app starts by initializing Firebase.  
- It ensures any previous user is logged out.  
- The main widget (MyApp) is launched, showing the login screen.

# 2. Authentication (Login/Sign Up)

- LoginScreen is shown first.  
- User can:  
 - Enter email and password to log in.  
 - Or switch to sign-up mode to create a new account (with username, email, password).  
- On login:  
 - Authenticates with Firebase Auth.  
 - Updates the user's last login timestamp in Firestore.  
 - Navigates to the main extinguisher list screen.  
- On sign-up:  
 - Creates a new user in Firebase Auth.  
 - Adds user details (username, email, userId, createdAt) to Firestore.  
 - Navigates to the main extinguisher list screen.

# 3. Main Screen (ExtinguisherListScreen)

- Shows a bottom navigation bar with three tabs:  
 1. Extinguishers (list)  
 2. Stats  
 3. Profile

## A. Extinguishers Tab

- Displays a searchable, filterable, and sortable list of fire extinguishers for the logged-in user.  
- Data is fetched in real-time from Firestore (fire collection, filtered by userId).  
- User can:  
 - Search by extinguisher name.  
 - Filter by category (e.g., Kitchen, Office).  
 - Sort by expiry date, name, or status (expired, expiring soon, safe).  
- Each extinguisher is shown as a card with:  
 - Name, expiry date, category, notes.  
 - Color-coded status (red = expired, orange = expiring soon, green = safe).  
 - Edit and delete buttons.  
- Expiry Alert: If any extinguisher is expired or expiring soon (within 5 minutes), a dialog pops up listing them.  
- Add Extinguisher: Floating action button opens a dialog to add a new extinguisher (name, category, notes, expiry date/time). Expiry must be at least 10 days in the future (unless in testing mode).

## B. Stats Tab

- Shows statistics for the user's extinguishers:  
 - Number expired, expiring soon, and safe.  
 - Lists of extinguishers in each category, with names and expiry dates.

## C. Profile Tab

- Shows user profile info (username, email).  
- Placeholder cards for settings and notifications.  
- Logout button to return to the login screen.

# 4. Firestore Data Structure

- Users Collection: Stores user info (email, username, userId, createdAt, lastLogin, role).  
- Fire Collection: Stores extinguishers (name, expiry, userId, category, notes).

# 5. Other Features

- Uses Material 3 design and a purple color scheme.  
- Uses real-time updates for extinguisher data.  
- Handles errors and shows user-friendly messages.

# Summary Table

|  |  |
| --- | --- |
| Screen/Feature | Purpose/Functionality |
| Login/Sign Up | User authentication, account creation, error handling |
| Extinguisher List | View, search, filter, sort, add, edit, delete extinguishers; expiry alerts |
| Stats | Visual stats and lists of expired/expiring/safe extinguishers |
| Profile | View user info, settings/notifications placeholders, logout |
| Firestore Collections | `users` (user info), `fire` (extinguisher info) |