High Level Design Document

Introduction

This High Level Design (HLD) document outlines the architecture and core components for **PropView - Real Estate Listing Portal UI**. PropView is a frontend portal enabling users to browse, filter, and view real estate listings with image galleries and interactive maps. The solution leverages React, advanced CSS, and Tailwind for a responsive, dynamic user experience.

1. System Architecture Overview

Architecture Summary:
PropView is a single-page application (SPA) built with React. It consumes listing data from an external API and renders interactive UI components for browsing, filtering, and viewing property details.

Module/Component	Role/Responsibility
App Shell	Root component, routing, global state/context
Listings Browser	Fetches/displays property listings, supports filtering
Listing Detail View	Shows property details, image gallery, map integration
Filter Panel	UI for filtering/searching listings
Image Gallery	Displays property images interactively
Map Viewer	Renders property locations on an interactive map
UI Layout/Styling	Responsive layouts using Tailwind and custom CSS

2. Component Interactions

Source Component	Target Component	Interaction Description
App Shell	Listings Browser	Initializes and routes to main listing view
Listings Browser	Filter Panel	Passes filter state, receives filter updates
Listings Browser	Listing Detail View	Navigates to detail view on listing selection
Listing Detail View	Image Gallery	Passes image data for display
Listing Detail View	Map Viewer	Passes location data for map rendering

Sequence Flow:

1. User lands on App Shell → Listings Browser fetches and displays listings
2. User applies filters via Filter Panel → Listings Browser updates results
3. User selects a listing → Listing Detail View opens with Image Gallery and Map Viewer

3. Data Flow Overview

Data Source	Consuming Component	Data Type/Flow Description
External Listings API	Listings Browser	Fetches property data (listings, images, location)
Listings Browser	Filter Panel	Provides available filter options
Filter Panel	Listings Browser	Sends filter criteria for data refresh
Listings Browser	Listing Detail View	Passes selected listing data
Listing Detail View	Image Gallery, Map Viewer	Passes images and geolocation data

4. Technology Stack

Layer/Function	Technology/Framework
UI Framework	React (JavaScript)
Styling/Layout	Tailwind CSS, custom CSS
State Management	React Context/State
Routing	React Router
Map Integration	Third-party JS map library
Data Fetching	Fetch API/Axios
Build Tooling	Vite or Create React App

5. Scalability & Reliability

- **Scalability:**
  - Stateless frontend; can be deployed on CDN or static hosting for horizontal scaling.
  - Modular React components enable easy feature extension and maintenance.

- **Reliability:**
  - Error boundaries for UI resilience.
  - Graceful handling of API/network errors.
  - Responsive design ensures usability across devices.

- **Security:**
  - No sensitive data stored client-side.
  - Follows best practices for frontend security (e.g., input validation, XSS prevention).

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