Sundar Karthik S
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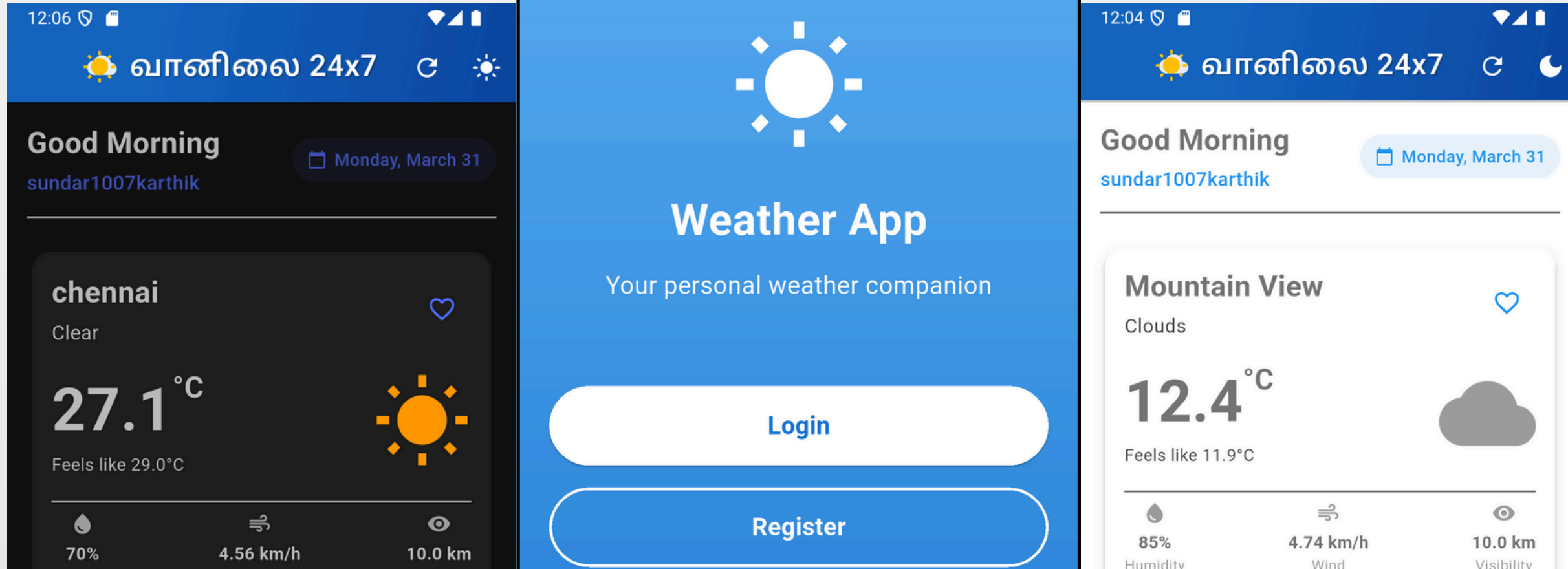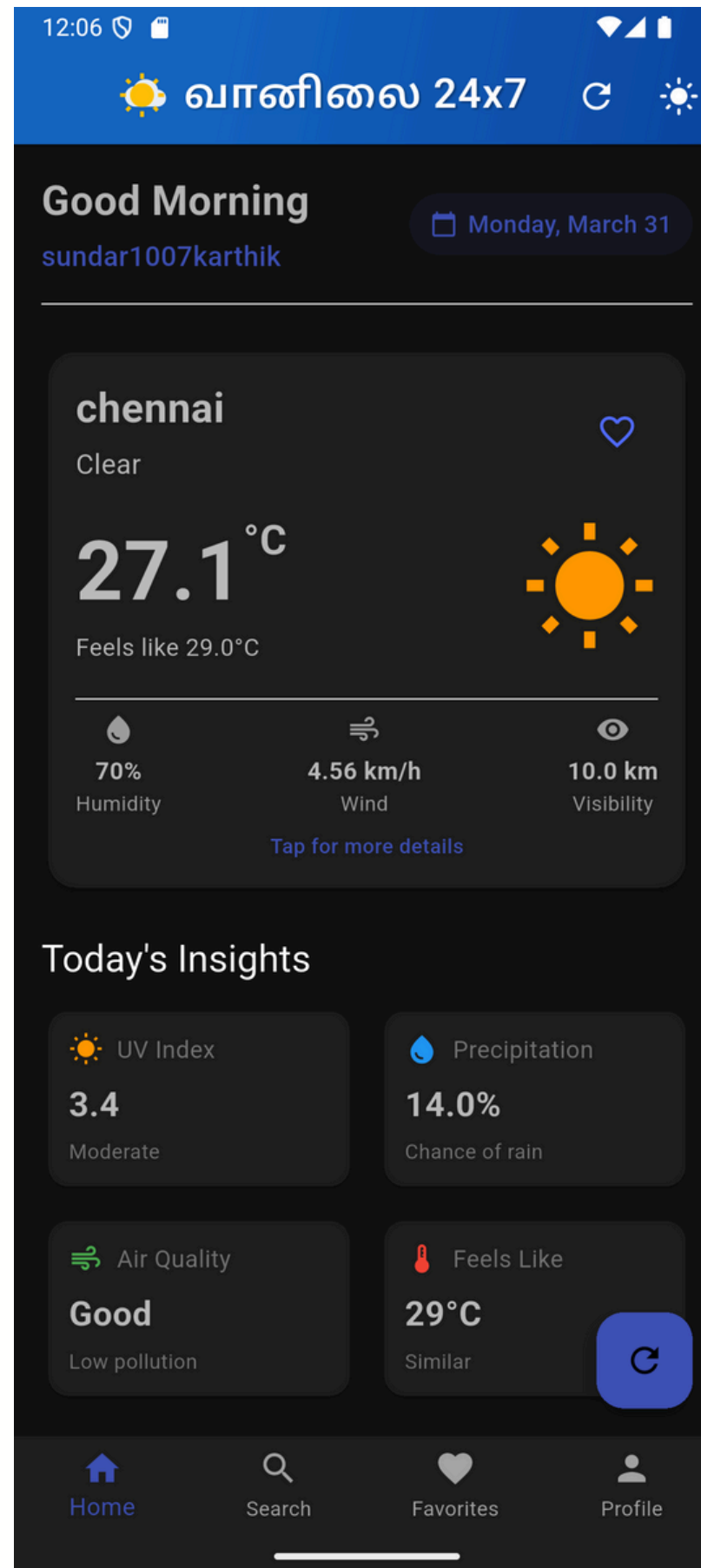

WELCOME

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Introduction

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Purpose
- Real-time weather information
- Forecasting with personalized user experience

Target Audience
- Weather enthusiasts,
- Daily commuters, Travelers
- Individuals planning outdoor activities or events.


● User Experience

An intuitive and clean user interface with dark and light theme options, which can be stored in local storage for guest users and in Firestore DB for signed-in users.

● Dashboard

Displays real-time weather based on the user's location by utilizing geolocation to fetch the current coordinates.

● Users & Accounts

Allows users to explore the app using a guest account and check out its features before signing in.

Introduction
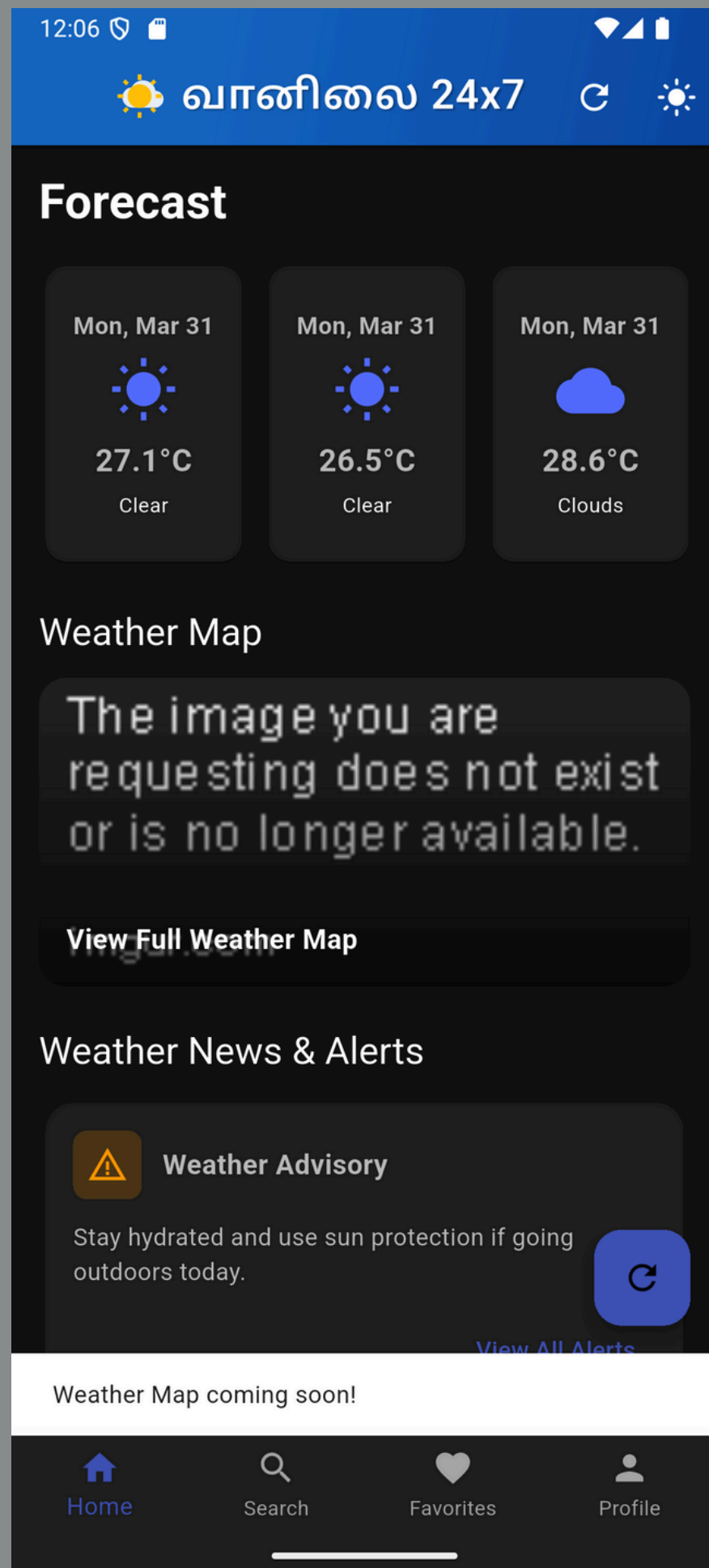
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Key Features

Key Features

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Core Functionality

- Real-time weather data with accurate forecasts.
- Location-based weather information using GPS.
- Detailed weather reports for specific cities.
- Hourly and 5-day forecasts with weather trends.
- Weather insights, including: Temperature, Humidity, Wind Speed, Feels Like Temperature, Air Quality Index (AQI), Precipitation Levels,
- Option to save favorite locations for quick access.
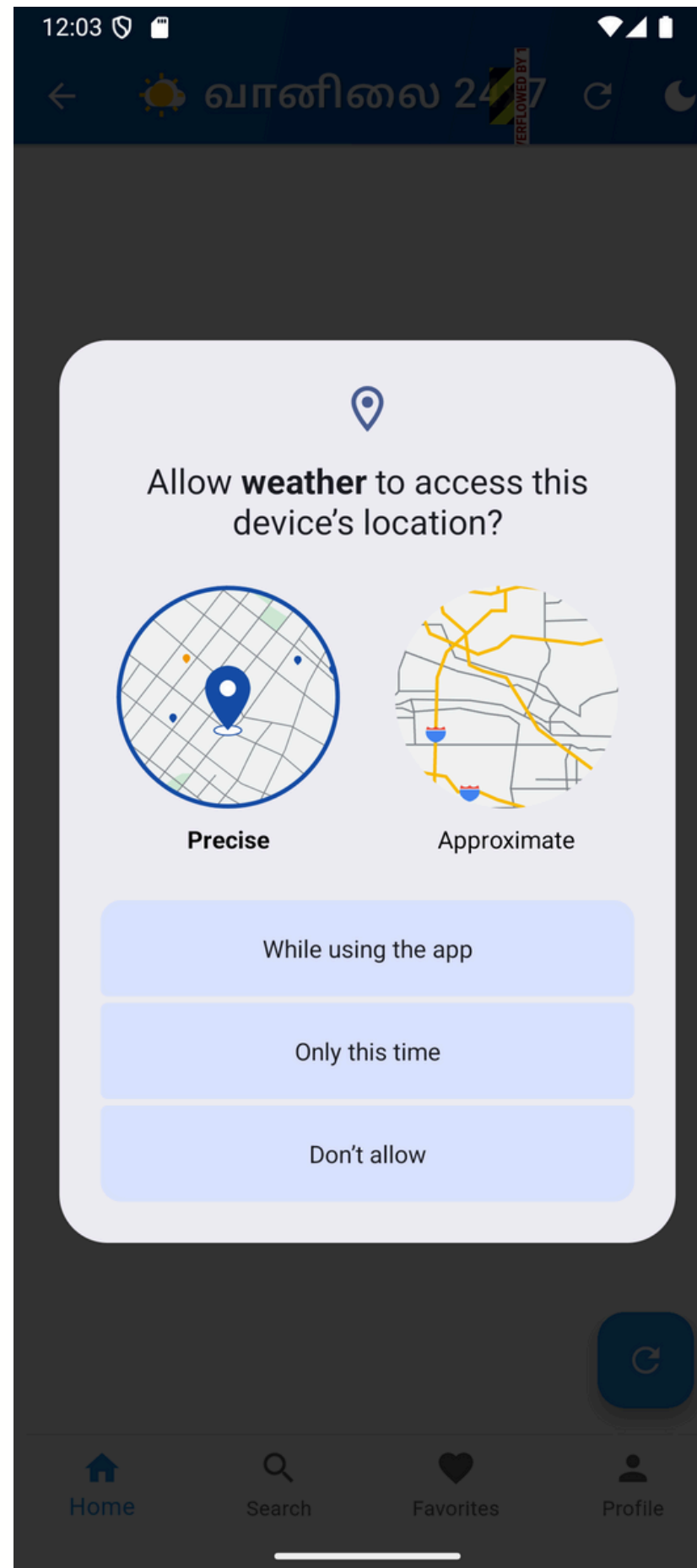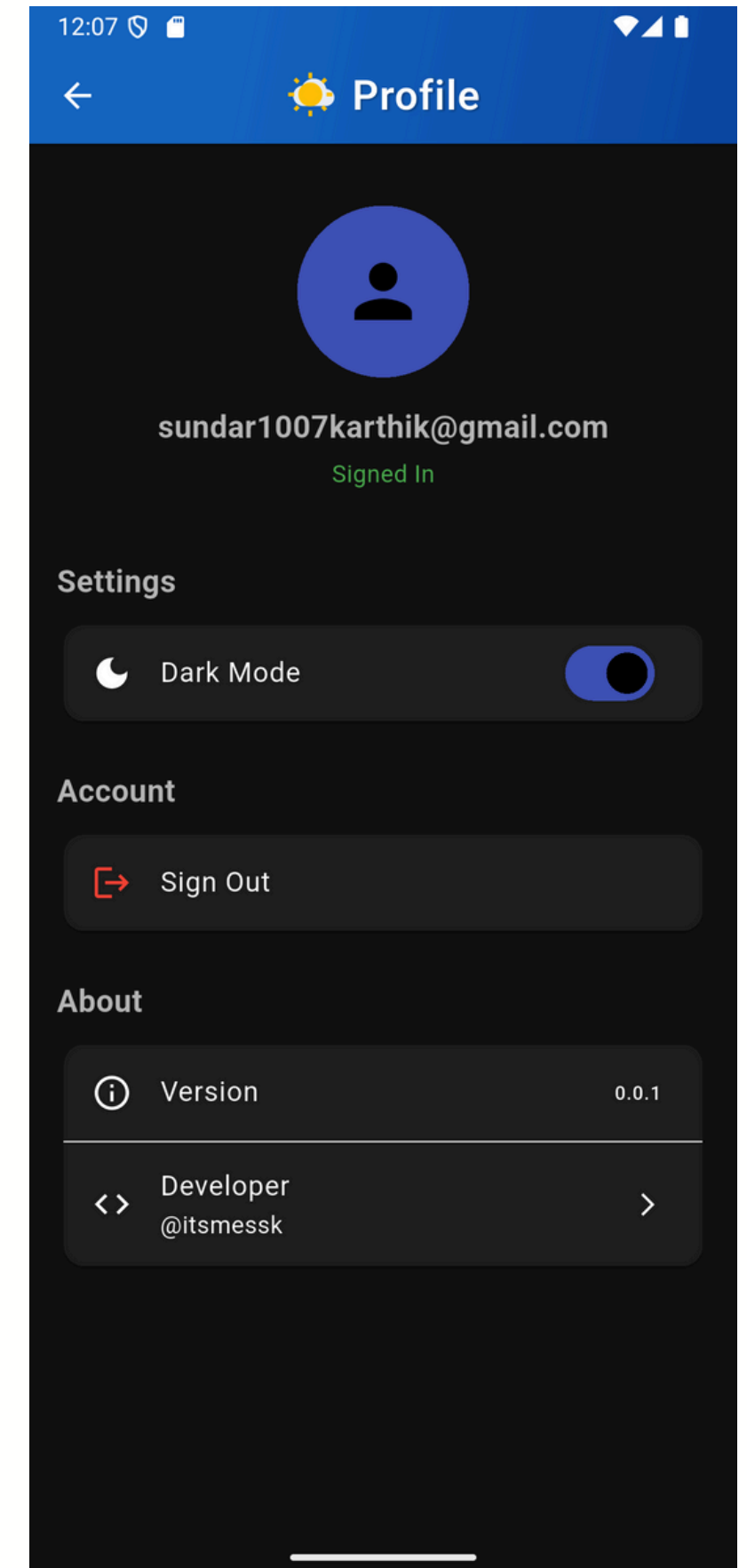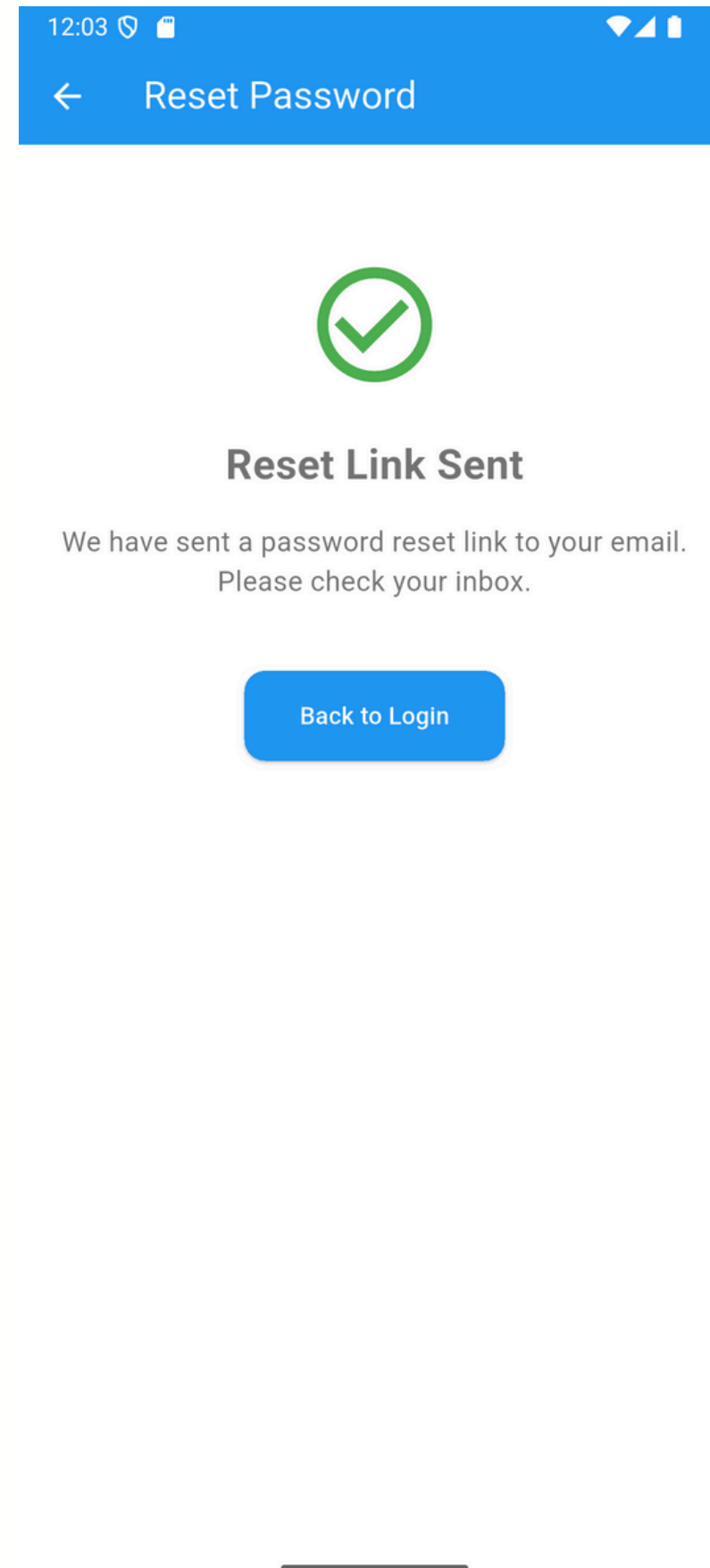

Technical Innovations

- Firebase Integration:
  - User authentication and account management.
  - Cloud-based preferences stored securely.
  - Real-time data syncing across multiple devices.
- Real-time Data Updates:
  - Instant weather updates from a trusted weather API.
  - Automatic refresh mechanism to keep data updated.
- Offline Support:
  - Caching weather data for offline viewing.
  - Essential data stored locally to maintain functionality without internet access.
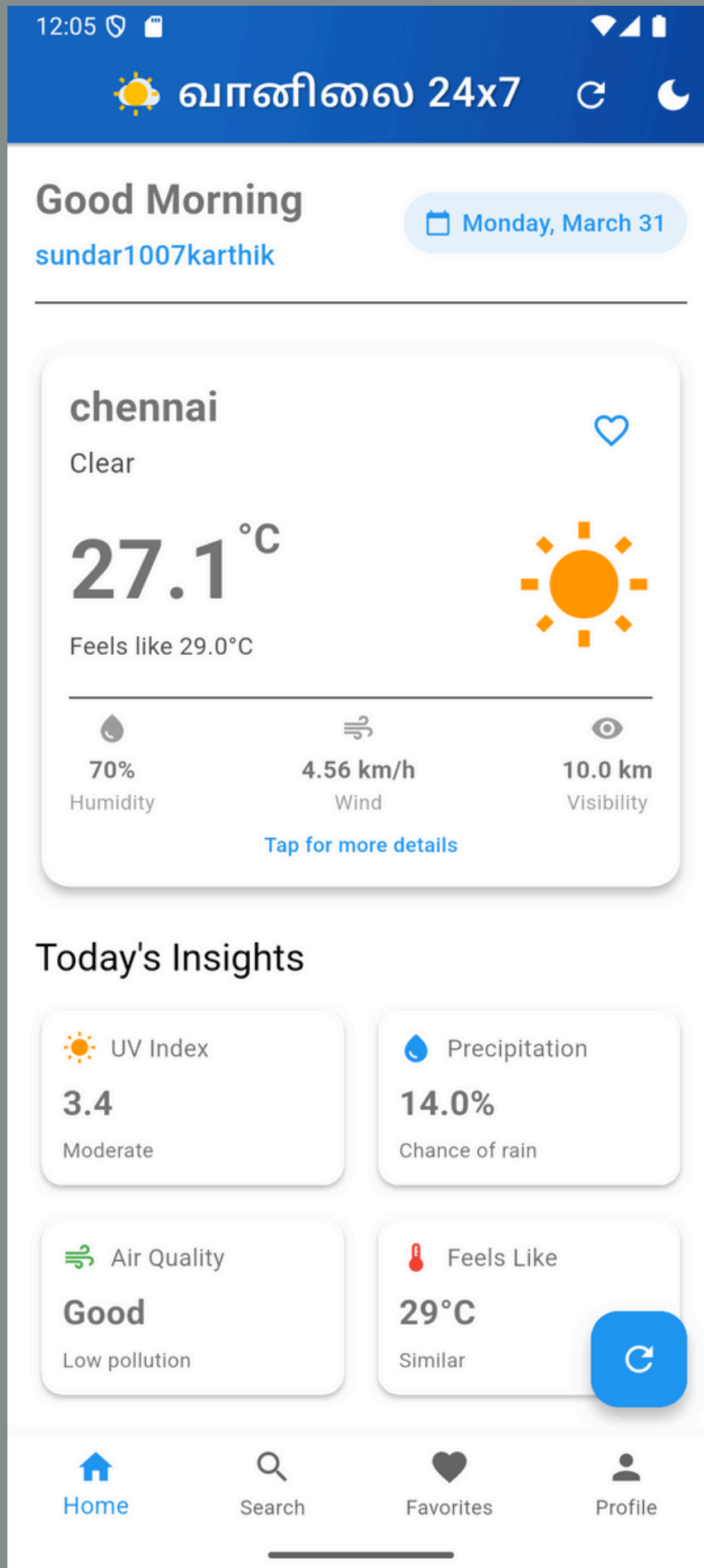
Features

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Key Features

🟢 **User Experience**

- Intuitive and clean user interface.
- Dark and light theme options, stored in:
- Local storage for guest users.
- Firestore DB for signed-in users.
- Allows users to explore the app with a guest account to check out its features before signing in.
- Password reset feature for secure account recovery.
- Flexible unit settings for:
- Temperature (℃/℉)
- Wind speed (km/h or mph)
- Responsive layout that adapts seamlessly across different devices.
- Quick access to relevant information with minimal taps.
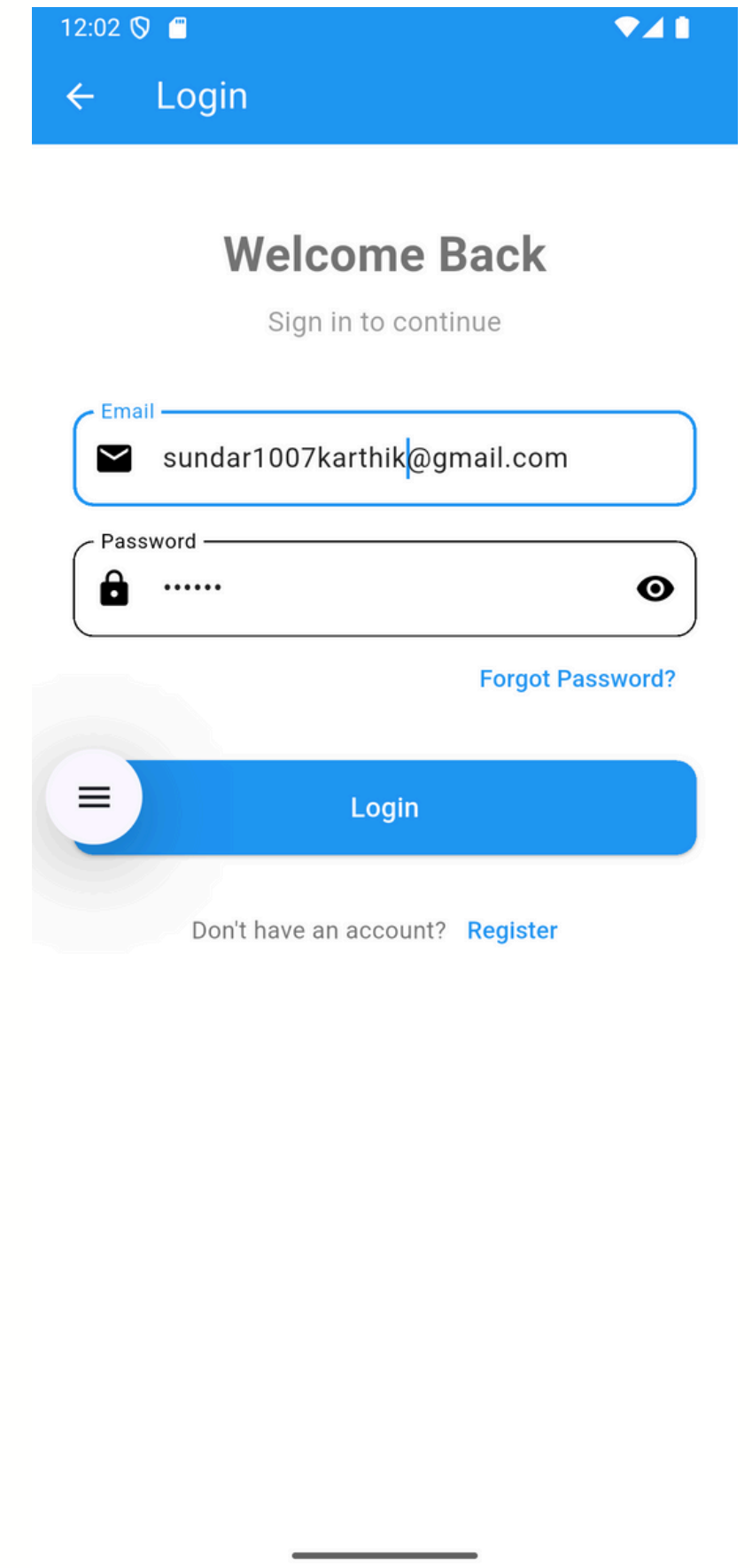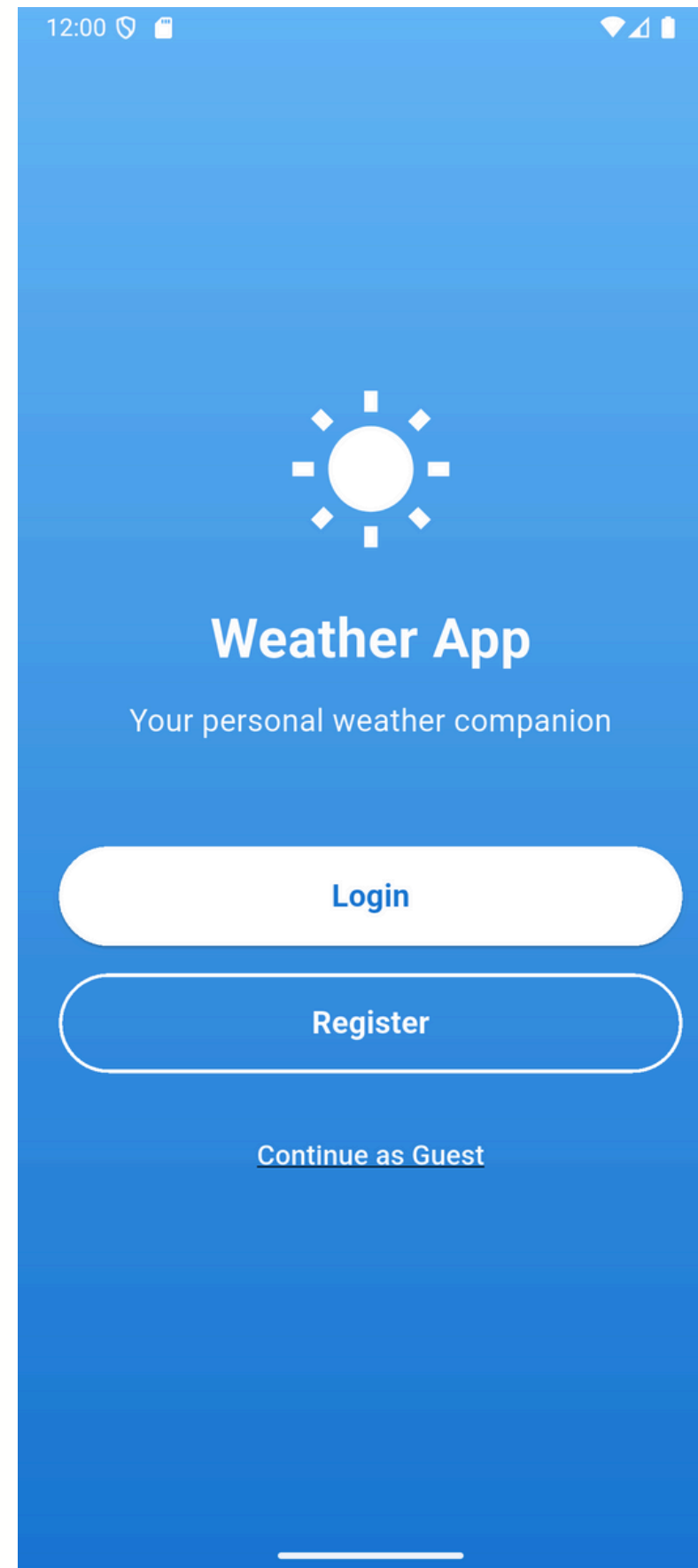
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App Screens and Functionality

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Welcome Screen

Features:
- Sign-up and login using Firebase Authentication.
- Option to explore the app without logging in.(Guest Mode)
- Overview of core features.
- Visually engaging introduction to enhance user retention.

Home Screen

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🟢 Current location weather overview.

🟢 Weather Insights Dashboard:

- Temperature
- Humidity
- Wind Speed
- Feels Like Temperature
- Air Quality
- Precipitation

🟢 Quick access buttons for adding to favorites and changing settings.

🟢 Scrollable forecast cards displaying hourly and 5-day weather data.
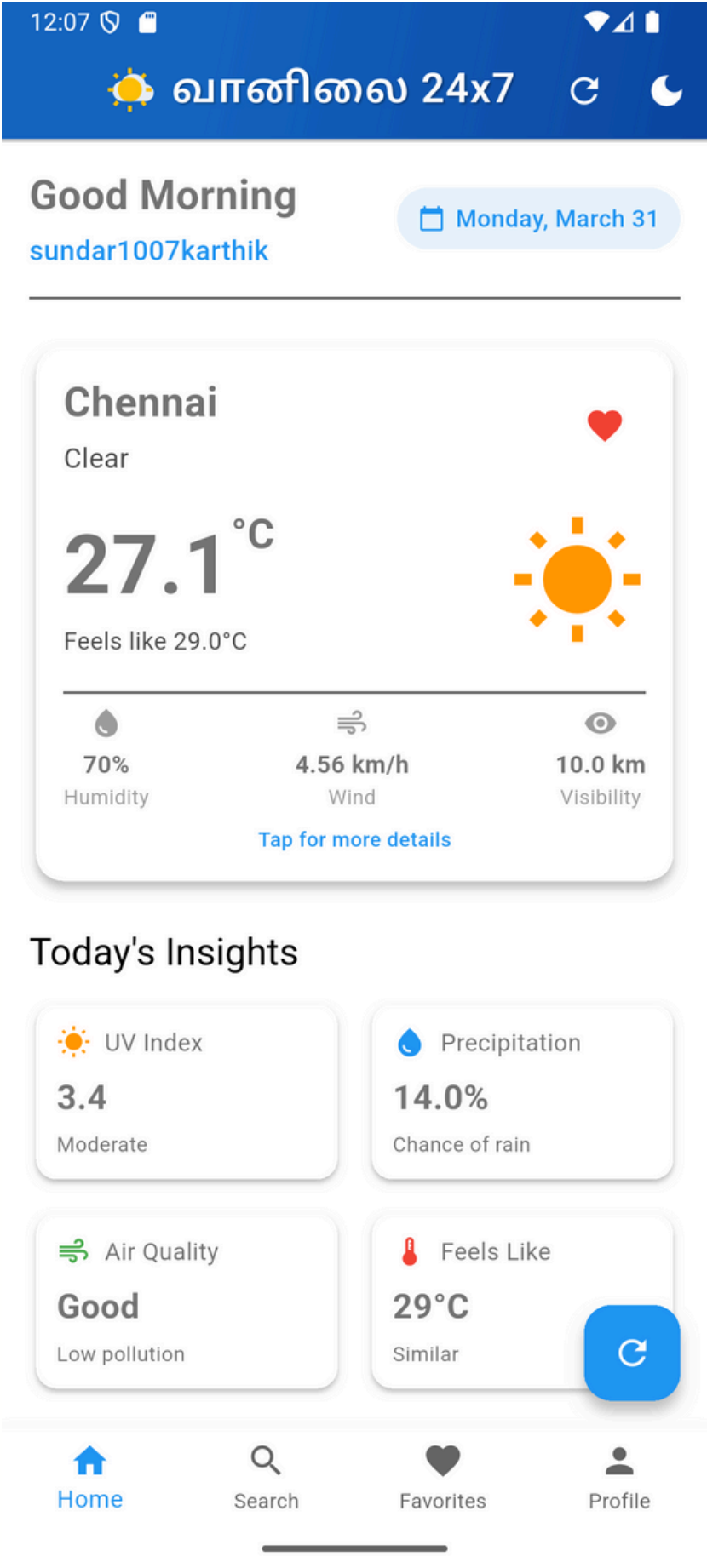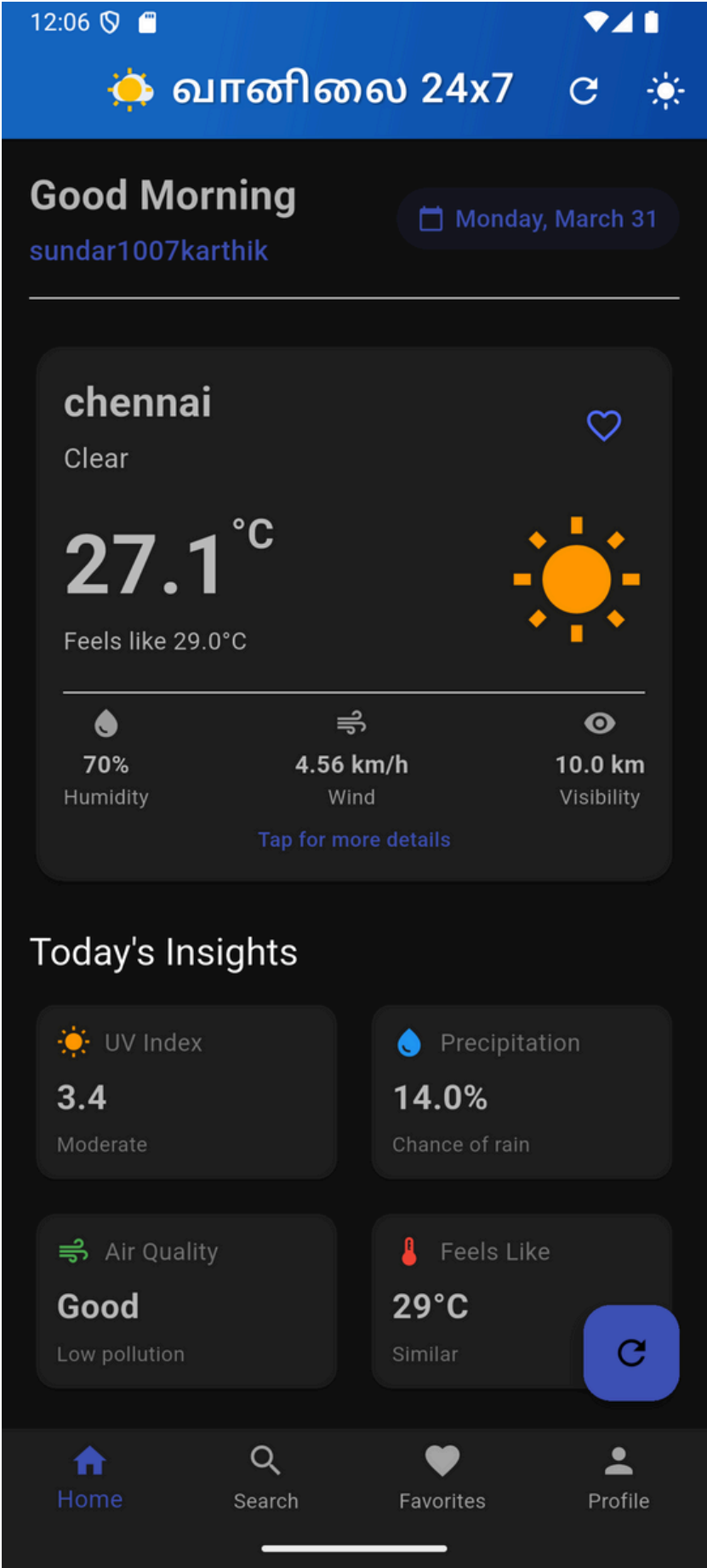
Home Screen

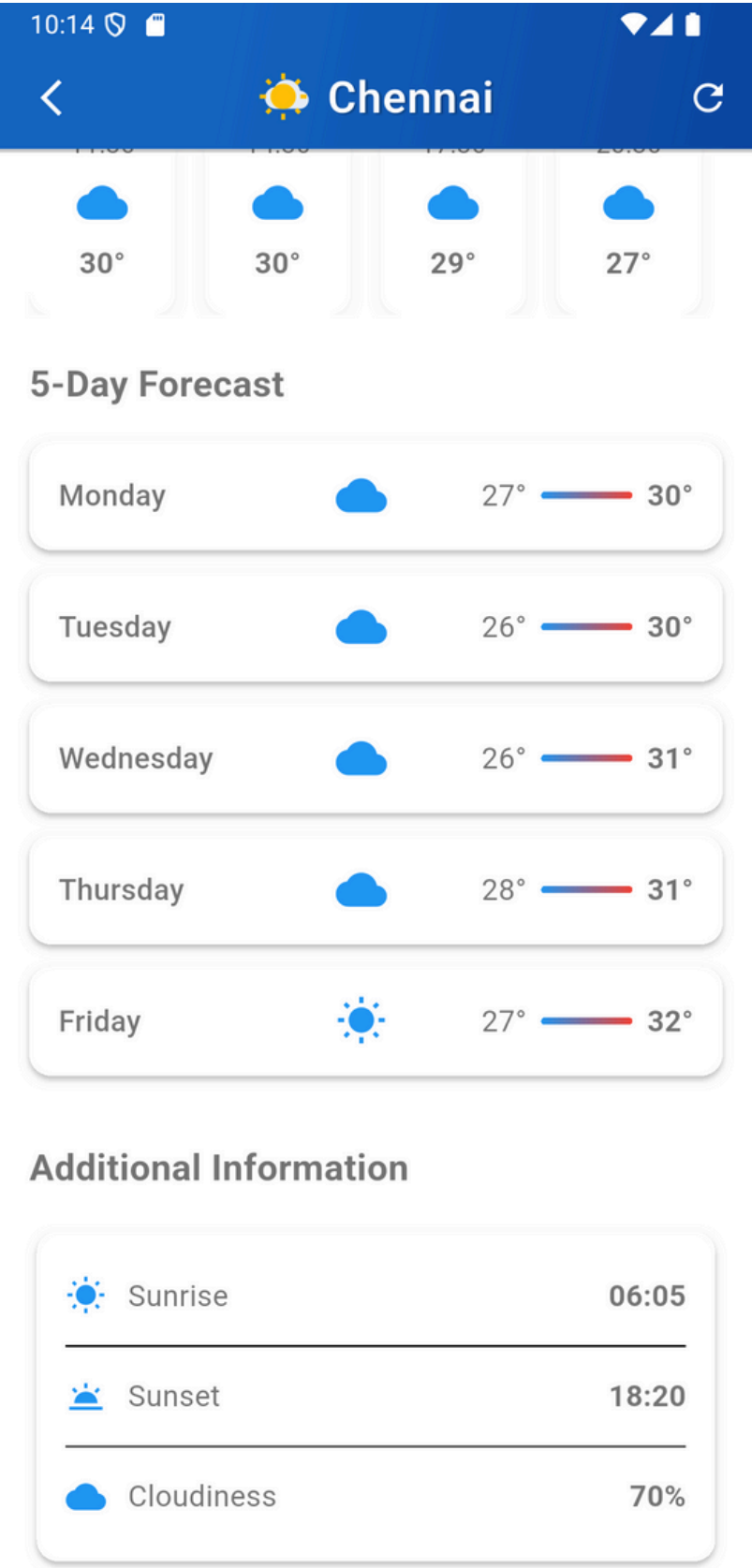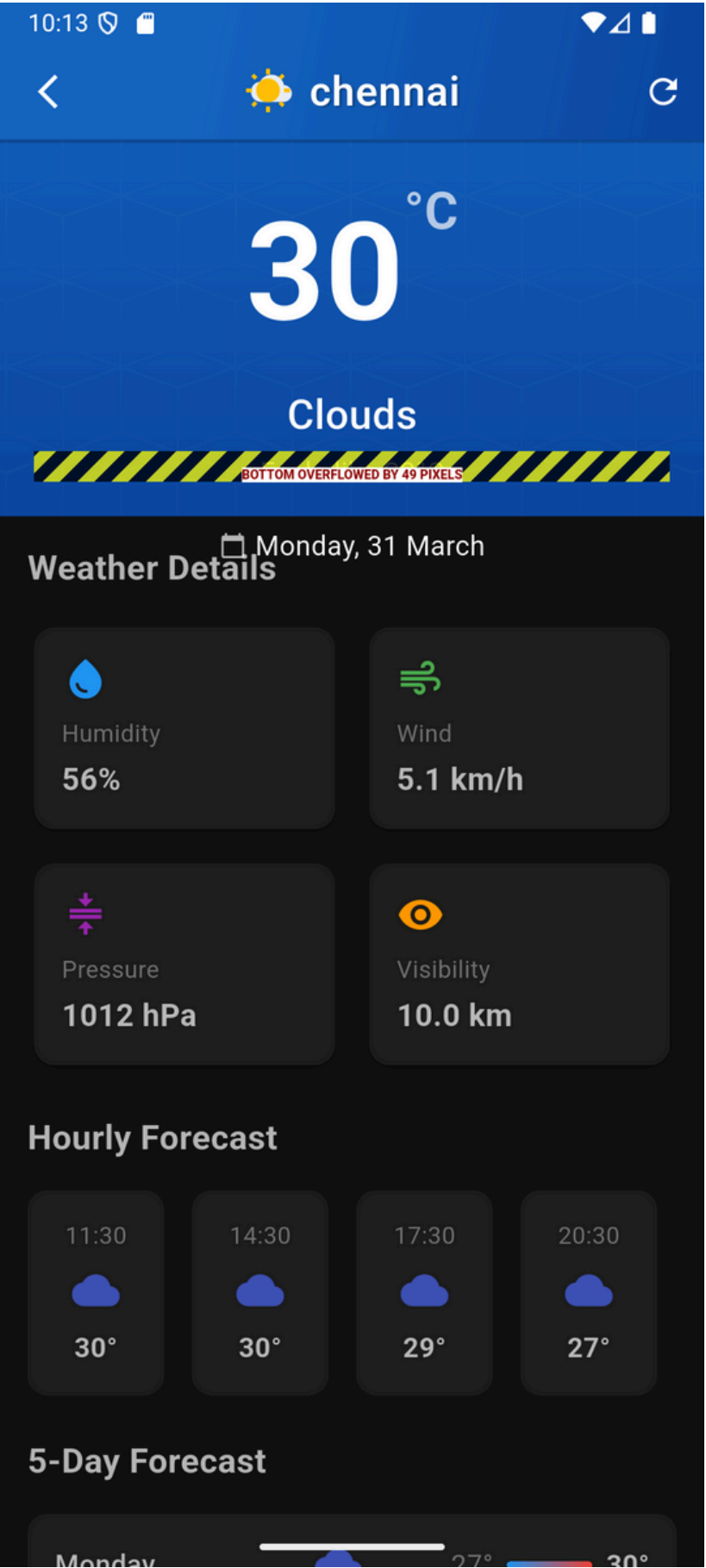**வானிலை 24X7**

City Details Screen

○ Comprehensive weather information for a selected city.

○ Gradient background that dynamically reflects current weather.

○ Hourly and 5-day forecasts with min/max temperatures.

○ Additional weather insights including:
   ▪ Sunrise and sunset timings
   ▪ Cloud cover and visibility

○ Option to add/remove the city from favorites.

City Details Screen

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Search Screen

- Search bar with auto-complete functionality.
- Search global cities using a reliable API.
- Recent and trending searches displayed for convenience.
- Suggestions based on user preferences and seasonal trends.
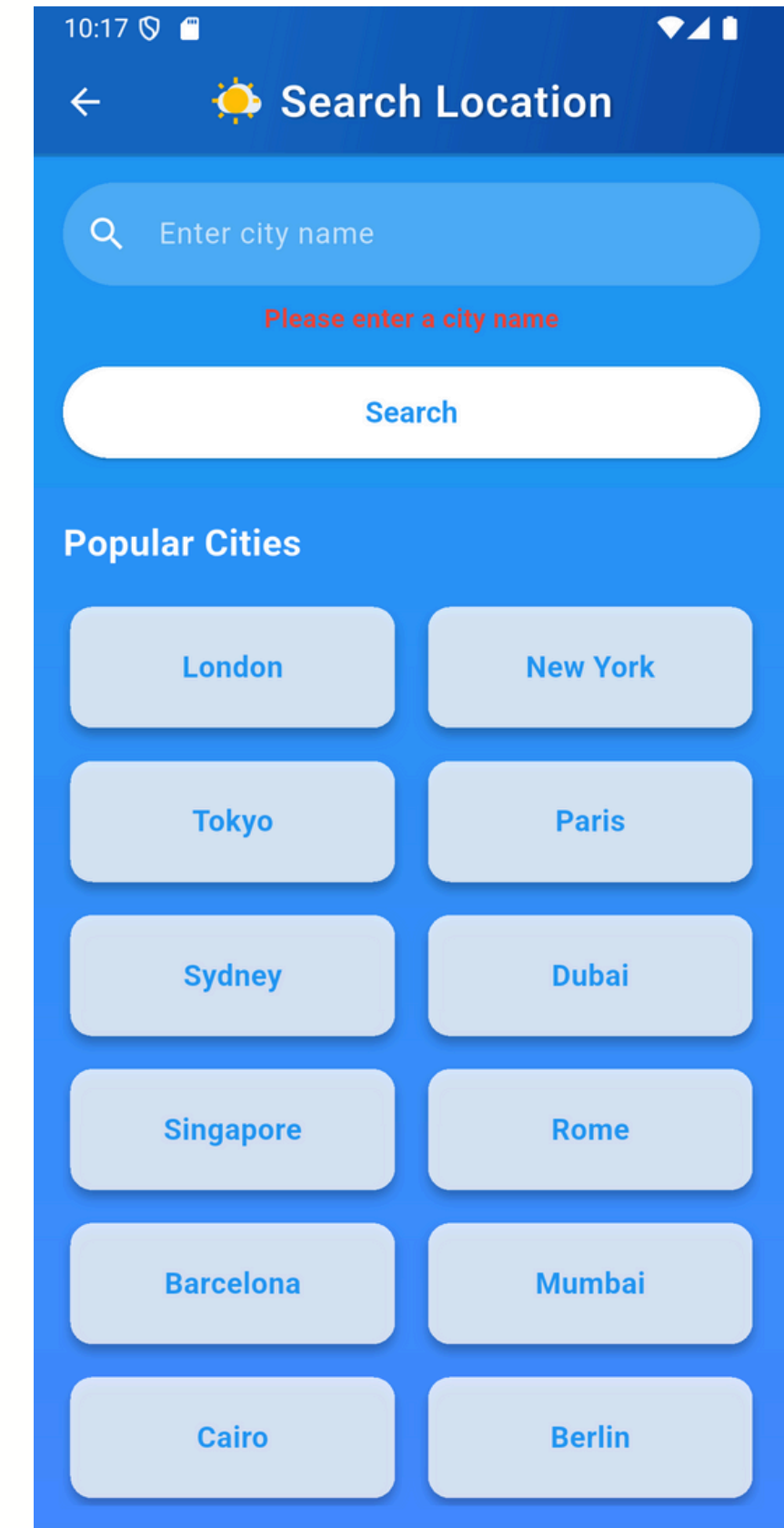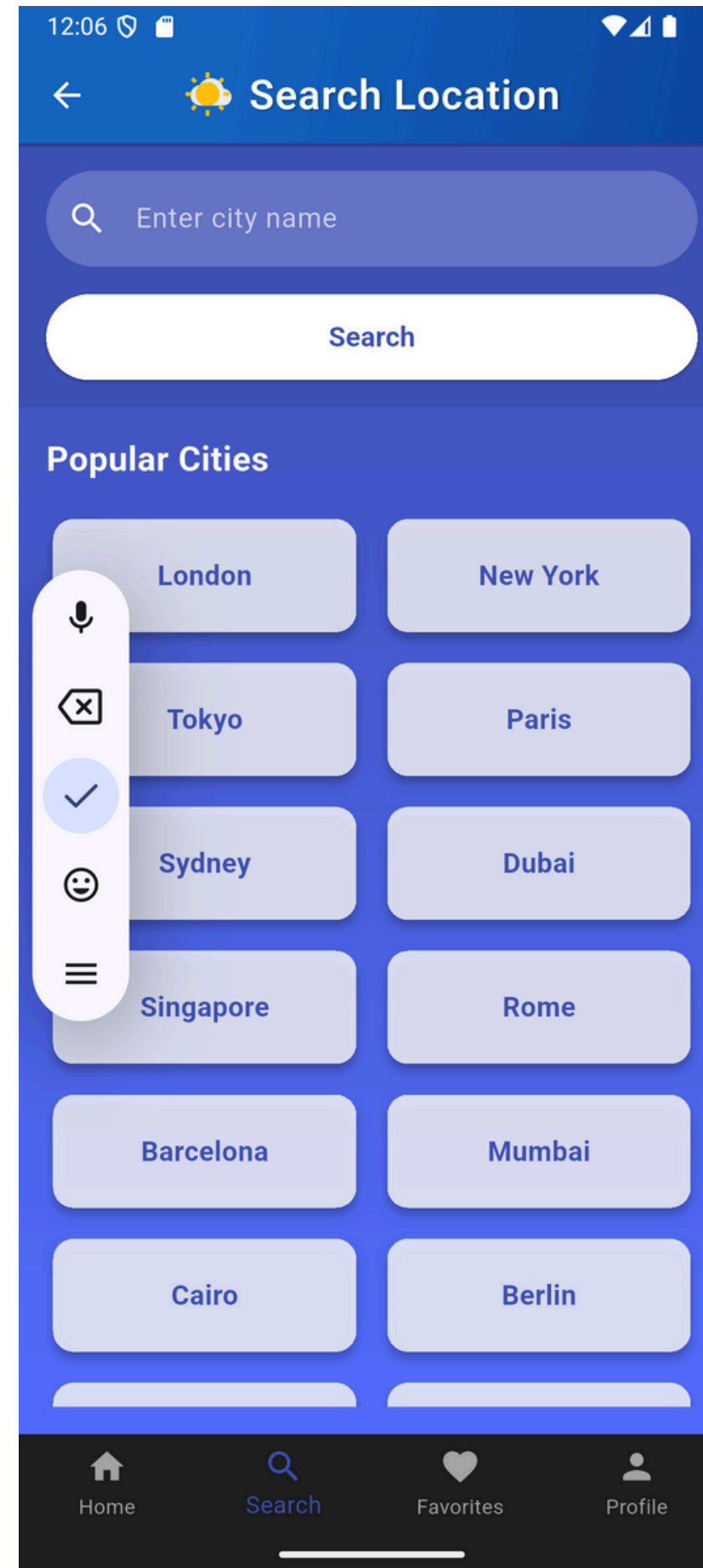
Search Screen

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Favorites Screen

- List of favorite locations with current conditions.
- Quick access to detailed city-specific weather reports.
- Option to reorder or remove favorites.
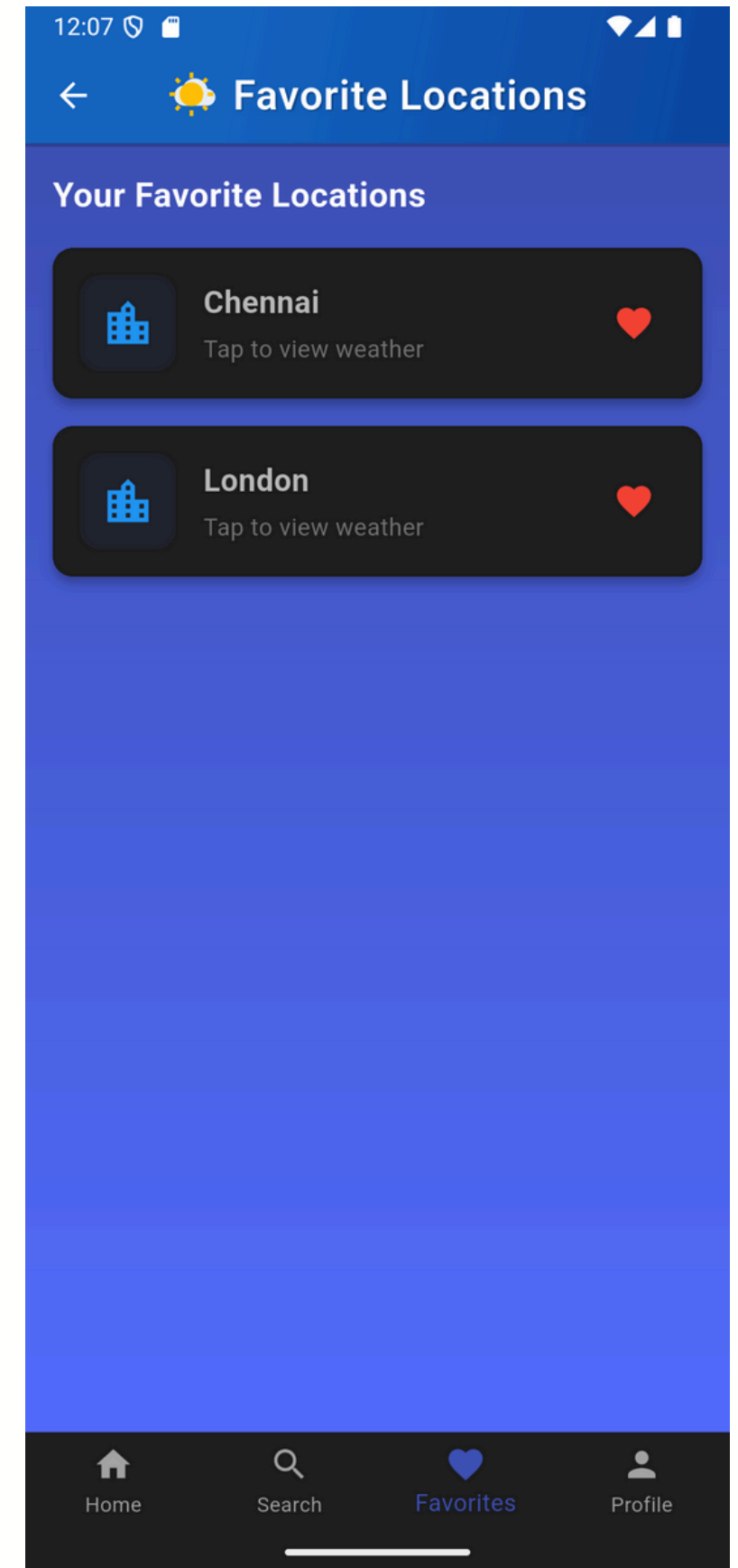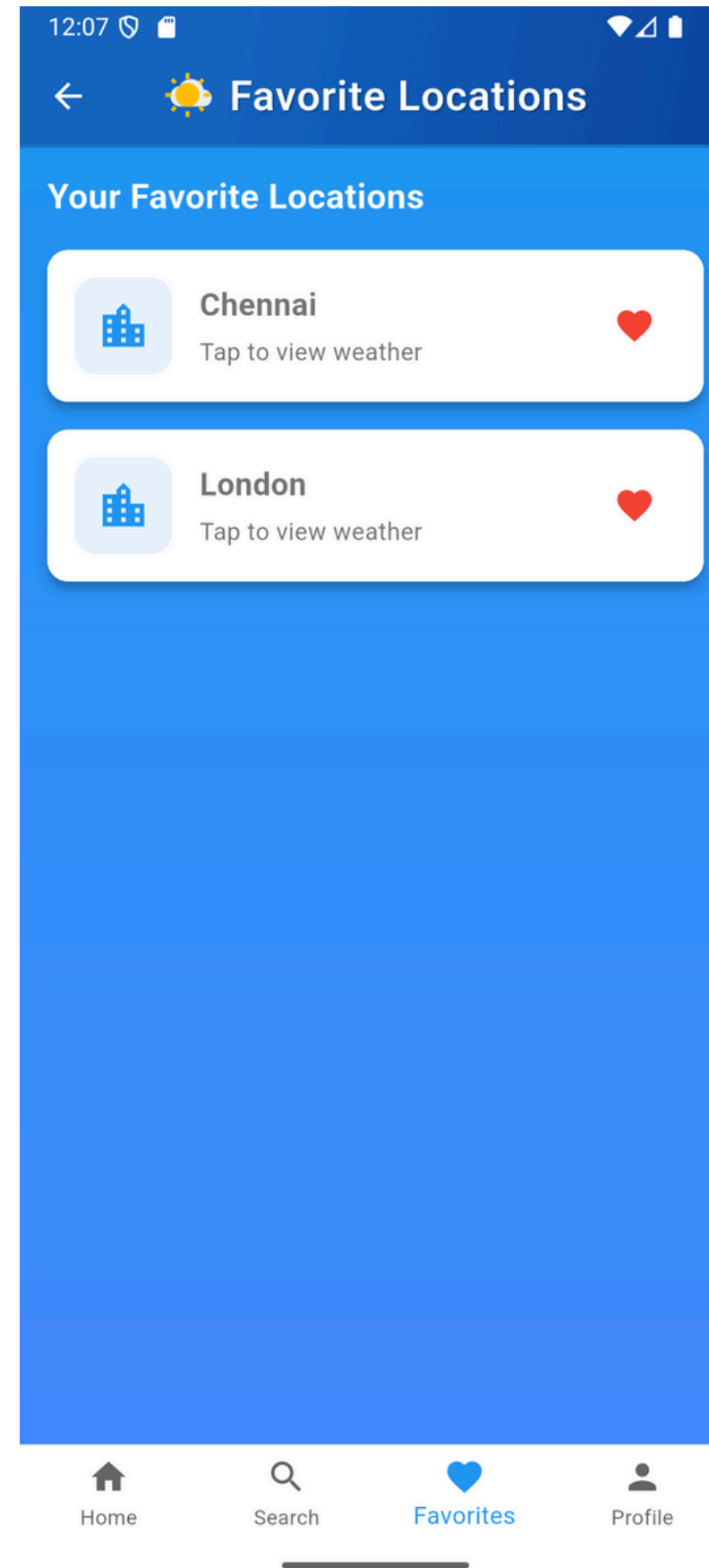
Favorites Screen

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Settings Screen

- User profile management.
- Theme toggle (light/dark mode).
- Unit configuration (temperature and wind speed).
- Default location preferences.
- Notification and alert settings.
- Account management options.
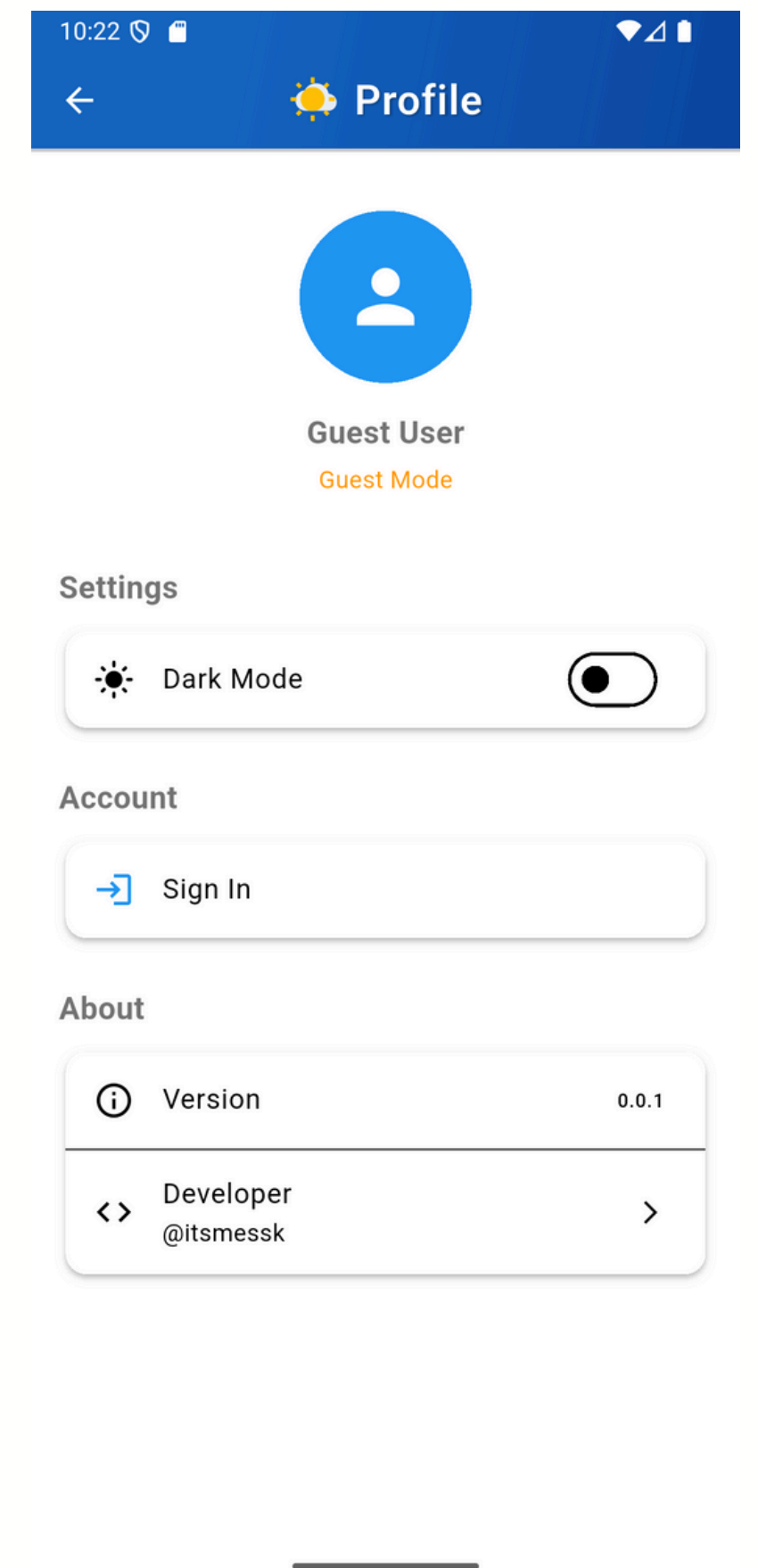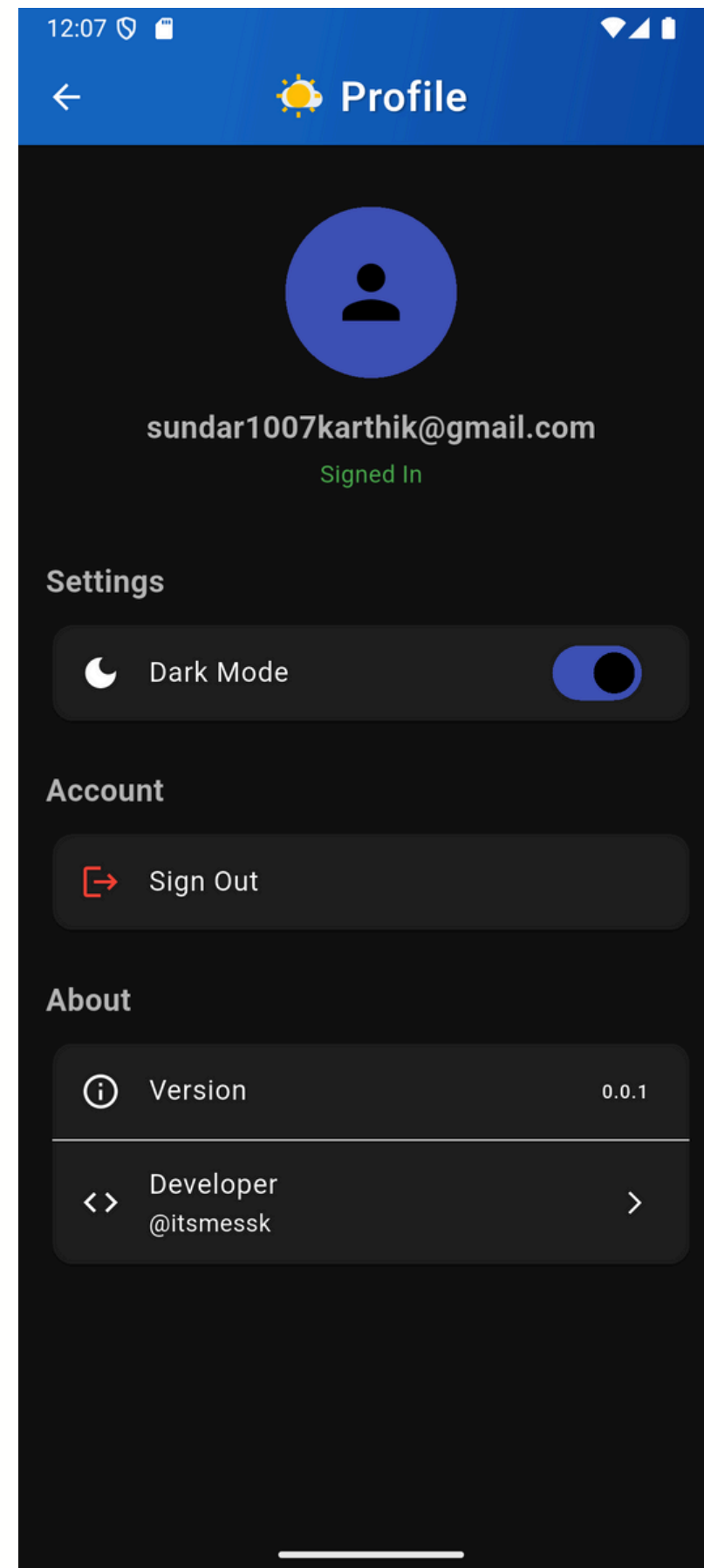
Settings Screen

Reset your password for event-app-c8926   Inbox ×

noreply@event-app-c8926.firebaseapp.com

00:03 (10 hours ago)

to me

Hello,

Follow this link to reset your event-app-c8926 password for your sundar1007karthik@gmail.com account.

https://event-app-c8926.firebaseapp.com/__/auth/action?mode=resetPassword&oobCode=geubSa-Esu1Qf_BBsj8DPrRxtP75YRAOOog-wxCOCggAAAGV6FQtRw&apiKey=AIzaSyDO-XUS90vymrDnVil1Hxbo7EOhIH4IOHI&lang=en

If you didn't ask to reset your password, you can ignore this email.

Thanks,

Your event-app-c8926 team

Reply   Forward

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Technical Implementation

Technical Implementation

Architecture Overview

Frontend

- Developed using Flutter for cross-platform
- Utilizes Dart for efficient, modern app development.
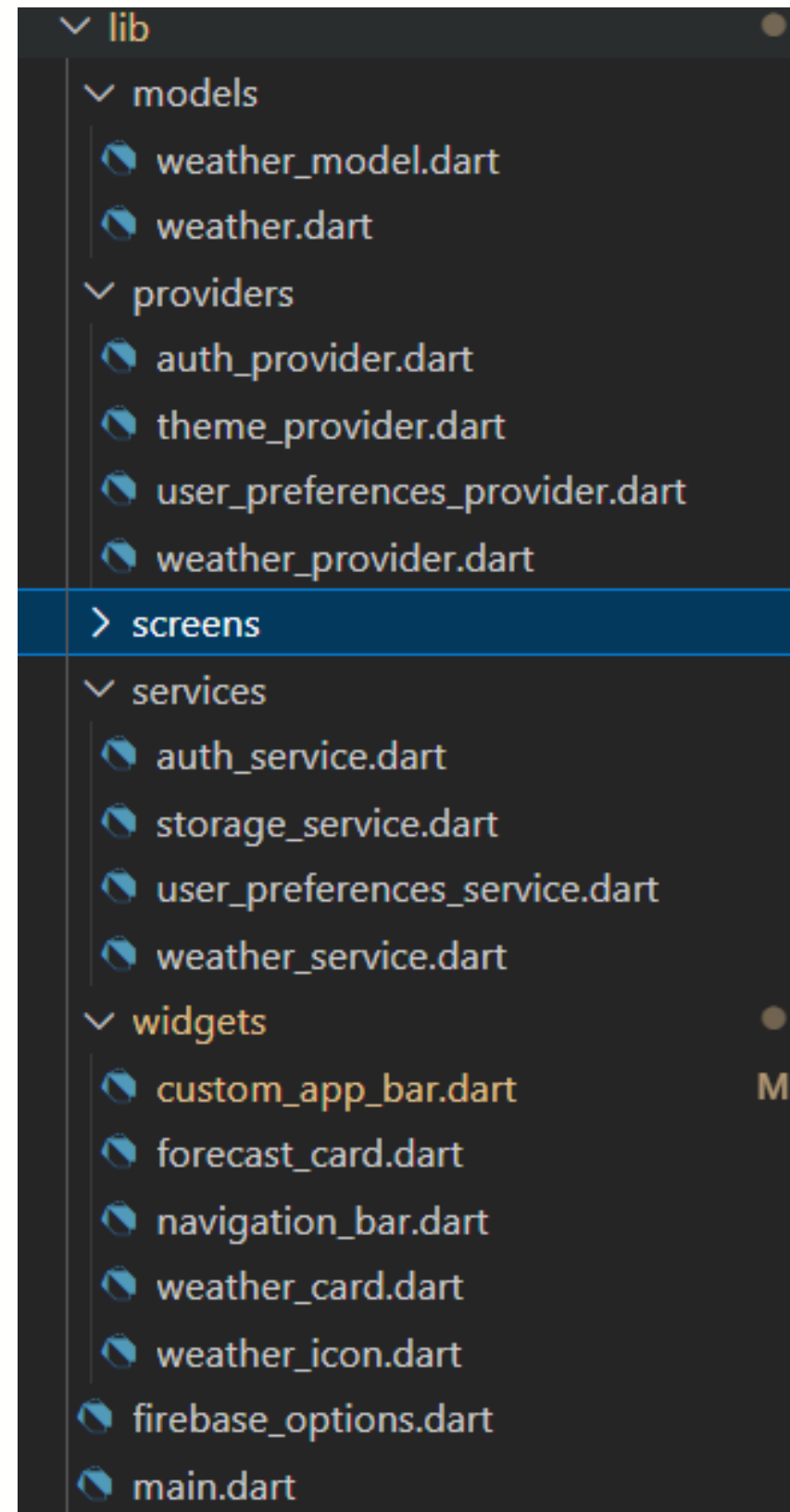- Provider Pattern used for state management.

Backend Services

- Firebase Authentication for user authentication.
- Firestore for storing user preferences and favorite locations.
- RESTful API integration to fetch real-time weather data.

Data Handling

- Weather data fetched through API requests.
- Firestore for storing user preferences and favorite locations.
- RESTful API integration to fetch real-time weather data.

File tree:

```
∨ lib
  ∨ models
      weather_model.dart
      weather.dart
  ∨ providers
      auth_provider.dart
      theme_provider.dart
      user_preferences_provider.dart
      weather_provider.dart
  > screens
  ∨ services
      auth_service.dart
      storage_service.dart
      user_preferences_service.dart
      weather_service.dart
  ∨ widgets                          M
      custom_app_bar.dart
      forecast_card.dart
      navigation_bar.dart
      weather_card.dart
      weather_icon.dart
    firebase_options.dart
    main.dart
```

Backend API Integration

Weather API: OpenWeatherMap

```dart
dels > weather_model.dart > WeatherModel
class WeatherModel {
  WeatherModel({
    required this.windSpeed,
    required this.lastUpdated,
    this.date,
  });

  factory WeatherModel.fromJson(Map<String, dynamic> json) {
    return WeatherModel(
      cityName: json['location']['name'],
      country: json['location']['country'],
      temperature: json['current']['temp_c'].toDouble(),
      condition: json['current']['condition']['text'],
      conditionIcon: json['current']['condition']['icon'],
      feelsLike: json['current']['feelslike_c'].toDouble(),
      humidity: json['current']['humidity'],
      windSpeed: json['current']['wind_kph'].toDouble(),
      lastUpdated: DateTime.parse(json['current']['last_updated']),
    );
  }

  factory WeatherModel.fromForecastJson(Map<String, dynamic> json) {
    return WeatherModel(
      cityName: json['location']['name'],
      country: json['location']['country'],
      temperature: (json['current']['avgtemp_c'] ?? 0).toDouble(),
      condition: json['condition']['text'],
      conditionIcon: json['condition']['icon'],
      feelsLike: (json['current']['avgtemp_c'] ?? 0).toDouble(), //
      humidity: (json['current']['avghumidity'] ?? 0).toInt(),
      windSpeed: (json['current']['maxwind_kph'] ?? 0).toDouble(),
      lastUpdated: DateTime.now(),
      date: DateTime.parse(json['date']),
    ); // WeatherModel
  }
}
```

API Request Methods:

- 🟢 GET /current – Fetch real-time weather data.
- 🔴 GET /forecast/hourly – Retrieve hourly forecast.
- 🔴 GET /forecast/daily – Get 5-day forecast.

Response Handling:

- 🟢 JSON data parsed and mapped to UI.
- 🔴 API error handling with appropriate fallback mechanisms.

# Firebase Integration

Authentication

- Email/Password and Google Sign-in supported.
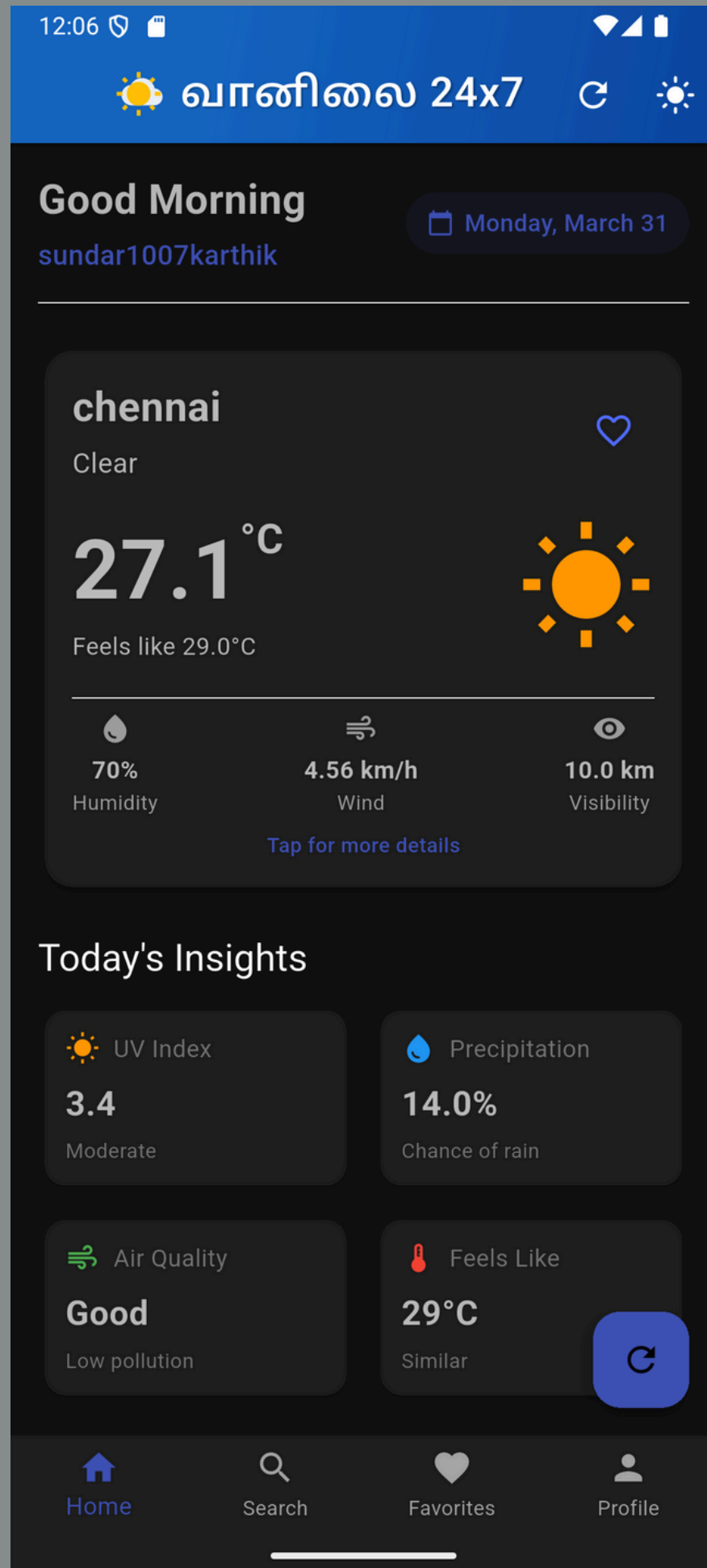- Token-based authentication for secure access.

Firestore Database:

- User preferences stored in users collection.
- Favorite locations stored in a separate favorites document.

Security Rules:

- Restricted read/write operations based on authenticated user access.
- Rules ensure only authorized users access personal data.
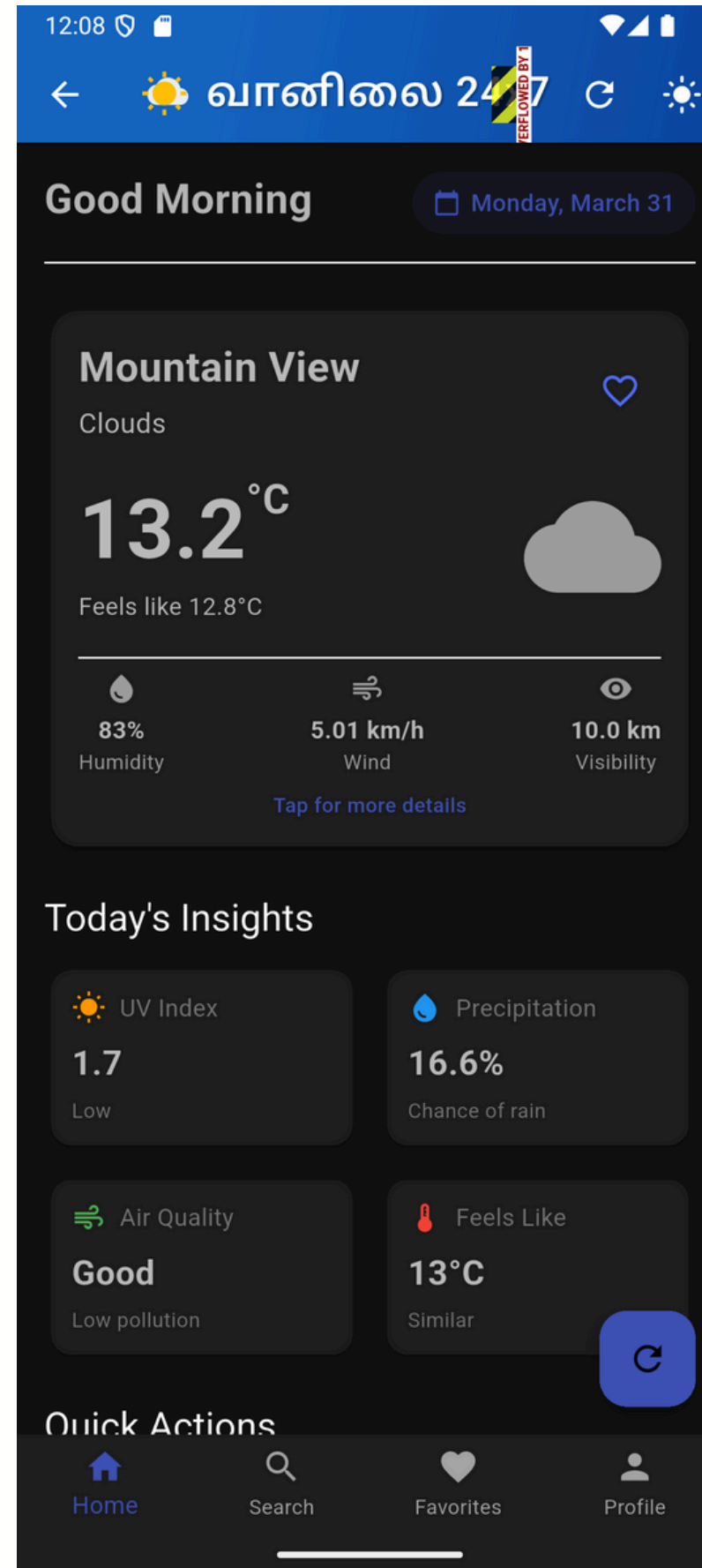

Firebase Integration
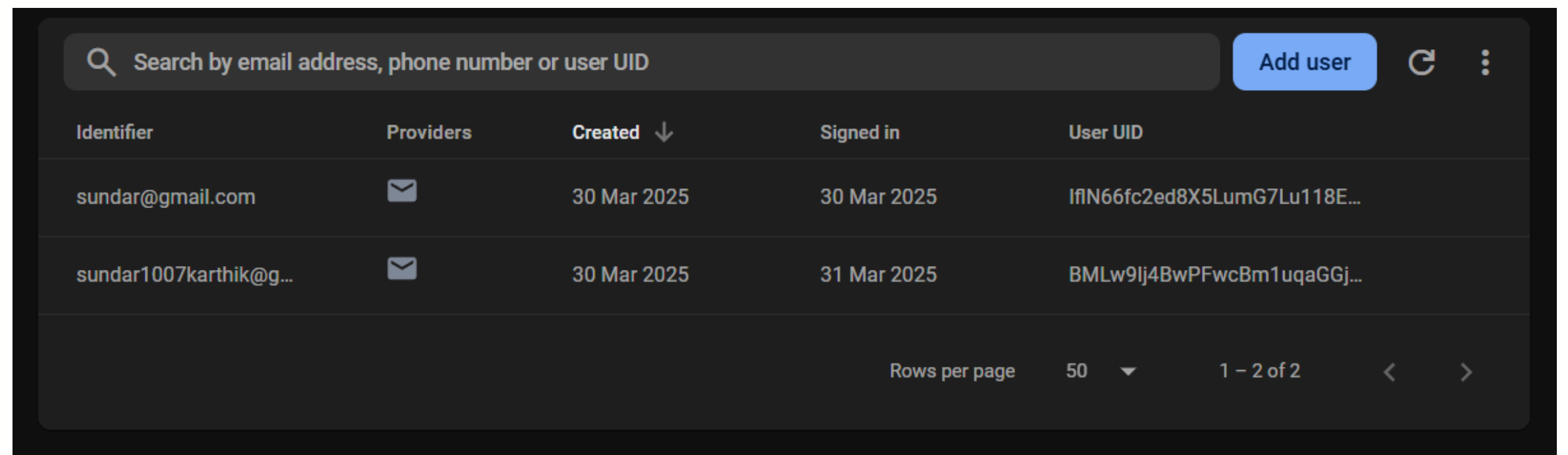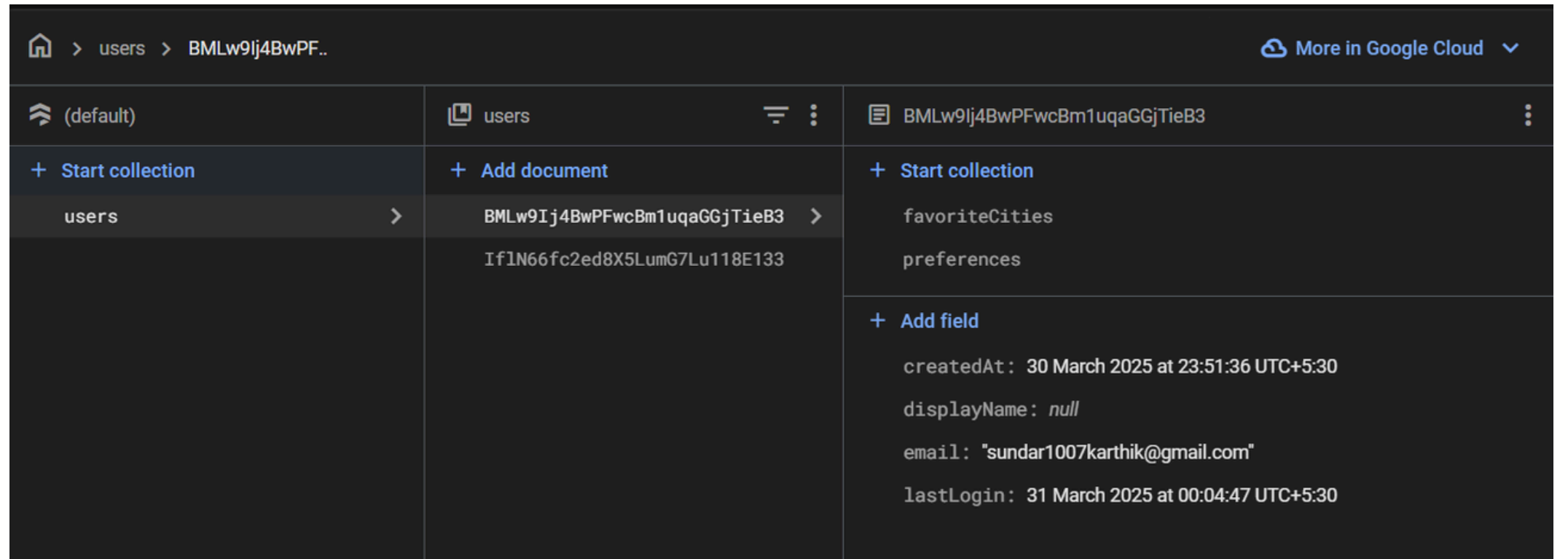
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User-Centric Design

User-Centric Design

User-Centric Design

UI/UX Principles

- Simplicity: Clean layout minimizing user learning curve.
- Visual Hierarchy: Emphasis on critical weather insights.
- Consistency: Uniform design across screens.
- Accessibility: Inclusive design with high contrast and readable fonts.

Design Elements

- Icons: Customized weather icons reflecting real-time conditions.
- Animations: Smooth transitions between screens.
- Responsive Layout: Adapts to mobile, tablet, and web devices.
- Color Scheme: Weather-dependent gradient backgrounds.
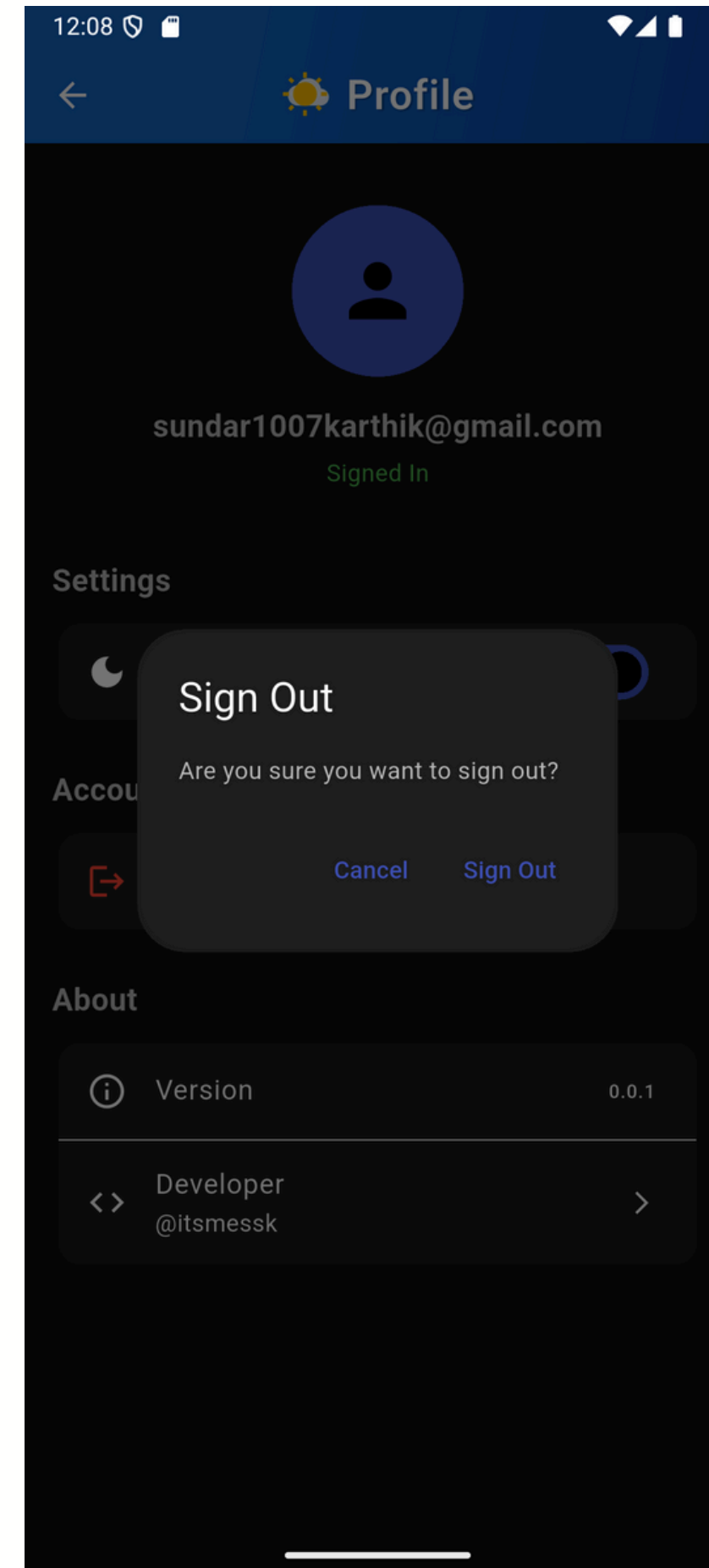- Typography: Legible fonts optimized for both light and dark themes.

User-Centric Design
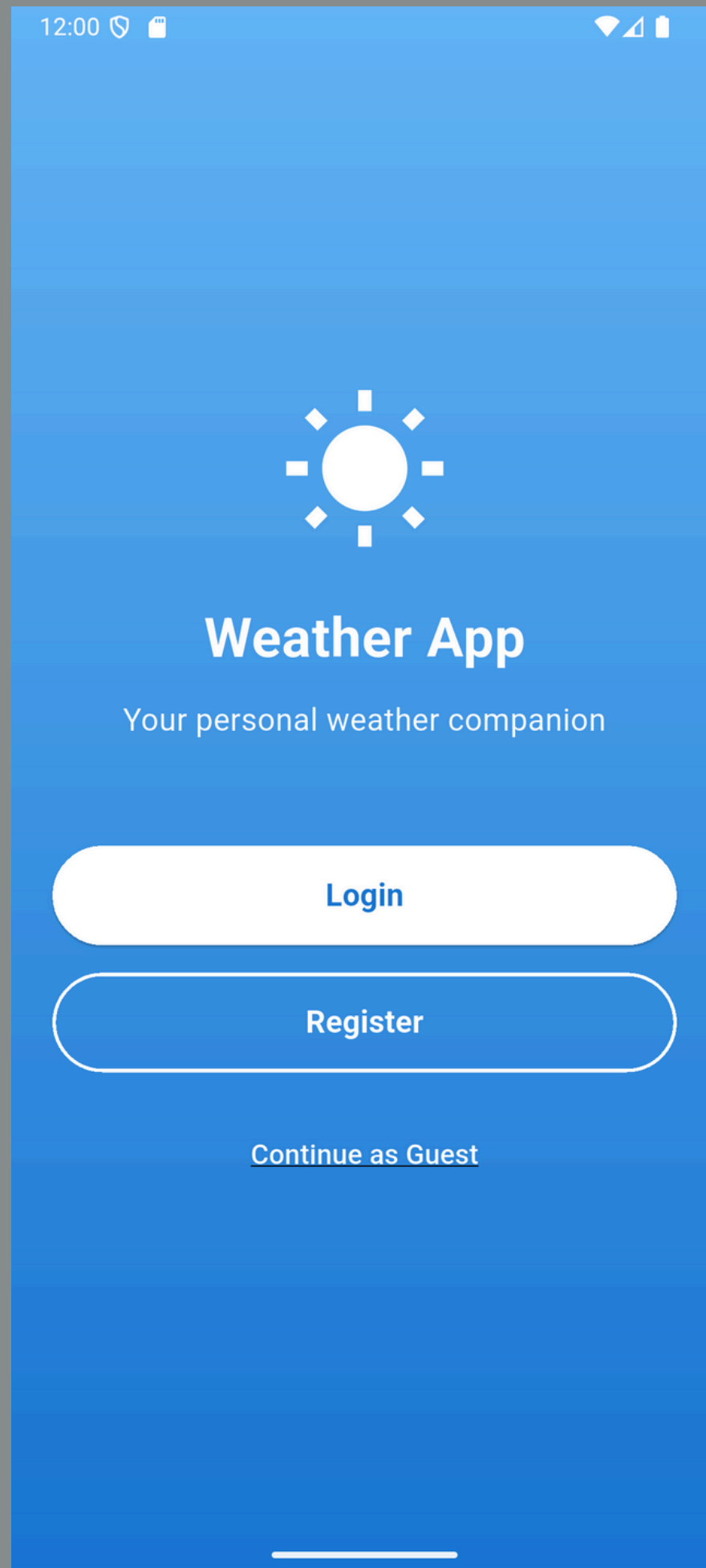
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Conclusion

Recap of Key Features and Benefits

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- Accurate real-time weather updates with detailed insights.
- Personalized experience with user preferences and favorites.
- Clean, modern interface ensuring intuitive navigation.
- Cloud-based data storage and synchronization.
- Offline support for seamless user experience.

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@itsmesssk

Thank You

@itsmessk