

Real Time Chat Application

Application Details:

This is a **real-time chat application** built using **Angular** and **Firebase**. It allows users to:

- **Sign in with Google**
- **Send and receive messages in real-time**
- **See messages from all users in the same chatroom**
- **Logout**
- **Auto-scroll to the latest message**
- **Display timestamps next to messages**

Workflow:

1. User Authentication:

- Users log in via **Google Sign-In** using **Firebase Authentication**.
- Once logged in, the user's profile (uid and displayName) is available in the app.

2. Real-time Messaging:

- The user types a message and clicks **Send**.
- The message, along with the user's uid, displayName, and timestamp, is saved to the **Firestore messages collection**.
- Firestore's **real-time listeners** auto-update the app, showing messages to **all users immediately**.

3. Message Display:

- Messages from all users are fetched and displayed in the chat window.
- The app differentiates between **"my messages"** and **"other user messages"** using the current user's uid.

4. Auto Scroll:

- After sending or receiving a new message, the chat window **auto-scrolls** to the latest message at the bottom.

5. Logout:

- User clicks **Logout**, which signs them out of Firebase and returns to the login screen.

Concepts Used:

Angular Concepts:

- **Standalone Component**
- **Dependency Injection** (`inject(AuthService)`)
- **RxJS Observables** (`user$, messages$`)
- **Angular Forms** (`[(ngModel)]`)
- **NgFor and NgIf Directives** (`*ngFor, *ngIf`)
- **NgClass** for dynamic styling
- **Event Binding** (`((click))`)

Firebase Concepts:

- **Firebase Authentication (Google Provider)**
- **Firebase Firestore (NoSQL Database)**
- **Firestore's real-time updates via `collectionData()`**
- **Security Rules** to allow read/write access

UX Enhancements:

- **Auto-scroll to bottom on new message**
- **Timestamps formatted using Angular Pipes (`date:'shortTime'`)**
- **Responsive chat layout (input stays at the bottom)**

Main Services:

1. **AuthService (Handles login/logout and user observable)**
2. **ChatService (Handles sending & receiving messages from Firestore)**

Extra Features added:

- Google Login & Logout
- Timestamp next to each message
- Messages styled differently for sender vs receiver
- Auto-scroll on message receive/send
- Responsive and clean UI (similar to WhatsApp/Telegram chat layout)