sequenceDiagram  
 actor User  
 participant UI as User Interface  
 participant MEC as MoodEntryController  
 participant AS as AuthService  
 participant MS as MoodEntryService  
 participant ACS as ActivityService  
 participant WS as WeatherService  
 participant LS as LocationService  
 participant DB as Database  
  
 User->>UI: Opens "Add Mood" screen  
 UI->>ACS: getActivities()  
 ACS->>DB: query(activities)  
 DB-->>ACS: activities list  
 ACS-->>UI: activities list  
 UI->>LS: getCurrentLocation()  
 LS-->>UI: location data  
 UI->>WS: getWeatherData(location)  
 WS-->>UI: weather conditions  
 UI-->>User: Displays form with activities, weather & location  
  
 User->>UI: Selects mood rating (1-10)  
 User->>UI: Selects activities  
 User->>UI: Adds optional notes  
 User->>UI: Taps "Save" button  
  
 UI->>MEC: createMoodEntry(moodData)  
 MEC->>AS: validateSession()  
 AS-->>MEC: validation result  
   
 alt Invalid Session  
 MEC-->>UI: Authentication Error  
 UI-->>User: "Please login to continue"  
 else Valid Session  
 MEC->>MS: saveMoodEntry(userId, moodData)  
 MS->>DB: insert(moodEntry)  
 DB-->>MS: success status  
   
 par Process Activities  
 MS->>DB: insertMoodActivities(moodId, activities)  
 DB-->>MS: success status  
 and Check Achievements  
 MS->>DB: checkAndUpdateAchievements(userId)  
 DB-->>MS: updated achievements  
 end  
   
 MS-->>MEC: success result  
 MEC-->>UI: confirmation  
 UI-->>User: "Mood saved successfully"  
   
 opt New Achievement Earned  
 UI-->>User: Shows achievement notification  
 end  
 end

## Figure 4.4: Sequence Diagram - Adding a Mood Entry

This sequence diagram illustrates the process of adding a new mood entry in the Pro Mood Tracker application, showing the interactions between the user, interface, and various system components.

### Process Flow

1. **Initial Setup**
   * User opens the “Add Mood” screen
   * The system retrieves available activities from the database
   * Location and weather data are automatically collected to provide context
2. **User Input**
   * User selects a mood rating on a scale of 1-10
   * User selects relevant activities that influenced their mood
   * User can add optional notes for additional context
   * User submits the entry by tapping “Save”
3. **Processing and Validation**
   * The system validates the user’s authentication session
   * If authentication fails, the user is prompted to log in
   * If authenticated, the mood entry processing continues
4. **Data Storage**
   * The mood entry is saved to the database
   * Associated activities are linked to the mood entry
   * The system checks if any achievements have been unlocked
5. **Feedback to User**
   * Confirmation is displayed when the mood entry is saved
   * If a new achievement is earned, a notification is shown

### Key Components

* **User Interface**: Handles data collection and display of information
* **Controllers**: Manage workflow and communication between components
* **Services**: Provide specialized functionality (authentication, mood entries, activities)
* **External Services**: Provide contextual data (weather, location)
* **Database**: Stores all persistent data

This sequence demonstrates the application’s user-centered design while highlighting the behind-the-scenes processes that enhance the mood tracking experience with contextual data and achievement recognition.