Project Title: AgriBuddy – Smart Crop Scheduling & Advisory Web Application

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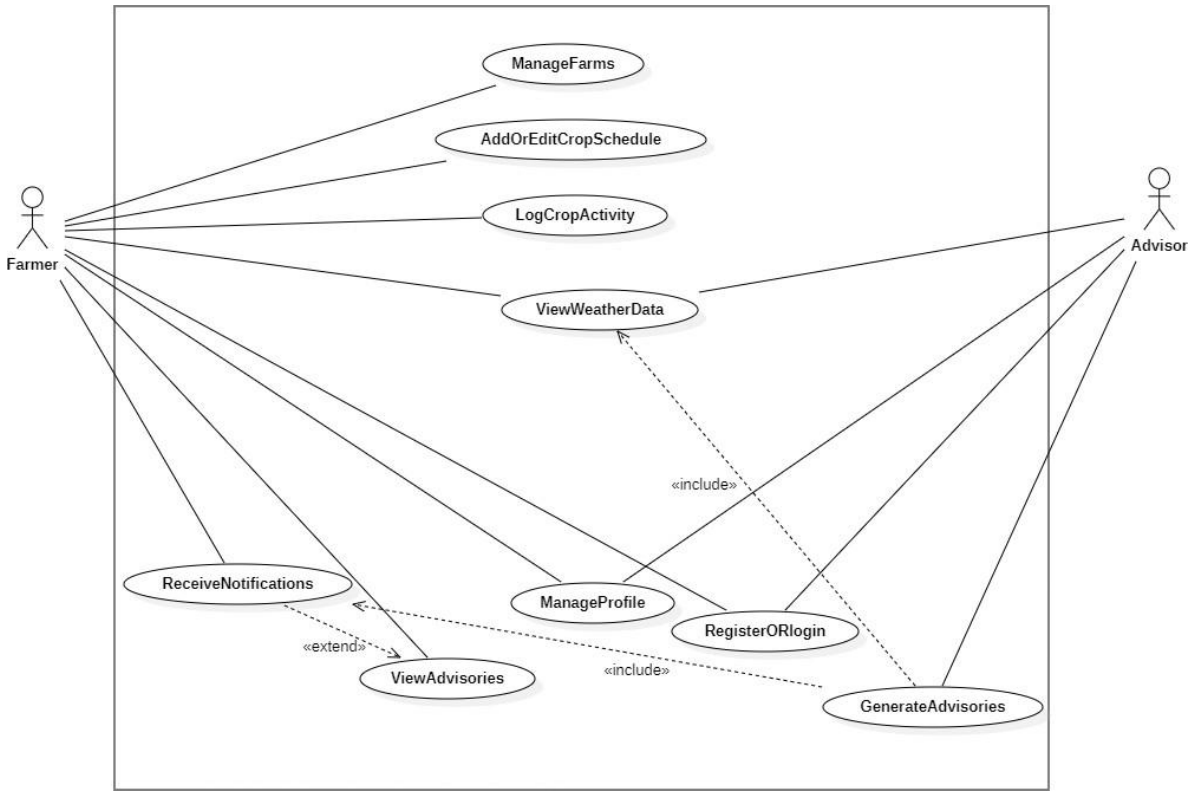
USE CASE DIAGRAM:



The Use Case Diagram of the Smart Crop Advisory System represents the interaction between system actors (Farmer and Advisor) and the functionalities provided by the system. It shows what actions users can perform and how different use cases are connected.

Actors:

1. Farmer – The primary user of the system who manages farms, crops, and receives advisories.
2. Advisor – An expert who provides advisories to farmers based on crop, weather, and farm data.

Use Cases:

1. RegisterOrLogin

    - Both Farmers and Advisors must register or log in before accessing the system.
    - This is an included use case since it is mandatory for all other actions.

2. ManageProfile

- Farmers and Advisors can update personal details like name, contact, and preferences.

3. ManageFarms (Farmer)

    - Farmers can add, edit, or delete farm details (location, size, soil type).

4. AddOrEditCropSchedule (Farmer)

    - Farmers can create schedules for planting and harvesting crops.
    - This helps in tracking farming activities.

5. LogCropActivity (Farmer)

    - Farmers record daily crop-related activities (irrigation, fertilization, etc.).

6. ViewWeatherData (Farmer & Advisor)

    - Both Farmers and Advisors can view weather information like temperature, rainfall, humidity, and wind speed.
    - This is an included use case since it is essential for crop planning and advisory generation.

7. GenerateAdvisories (Advisor)

    - Advisors create advisories for farmers based on weather, farm conditions, and crop data.

8. ReceiveNotifications (Farmer)

    - Farmers receive system notifications regarding advisories, crop alerts, or reminders.

9. ViewAdvisories (Farmer)

    - Farmers can read detailed advisories sent by Advisors.
    - This is an extended use case of ReceiveNotifications, as advisories are typically received through notifications.

Relationships

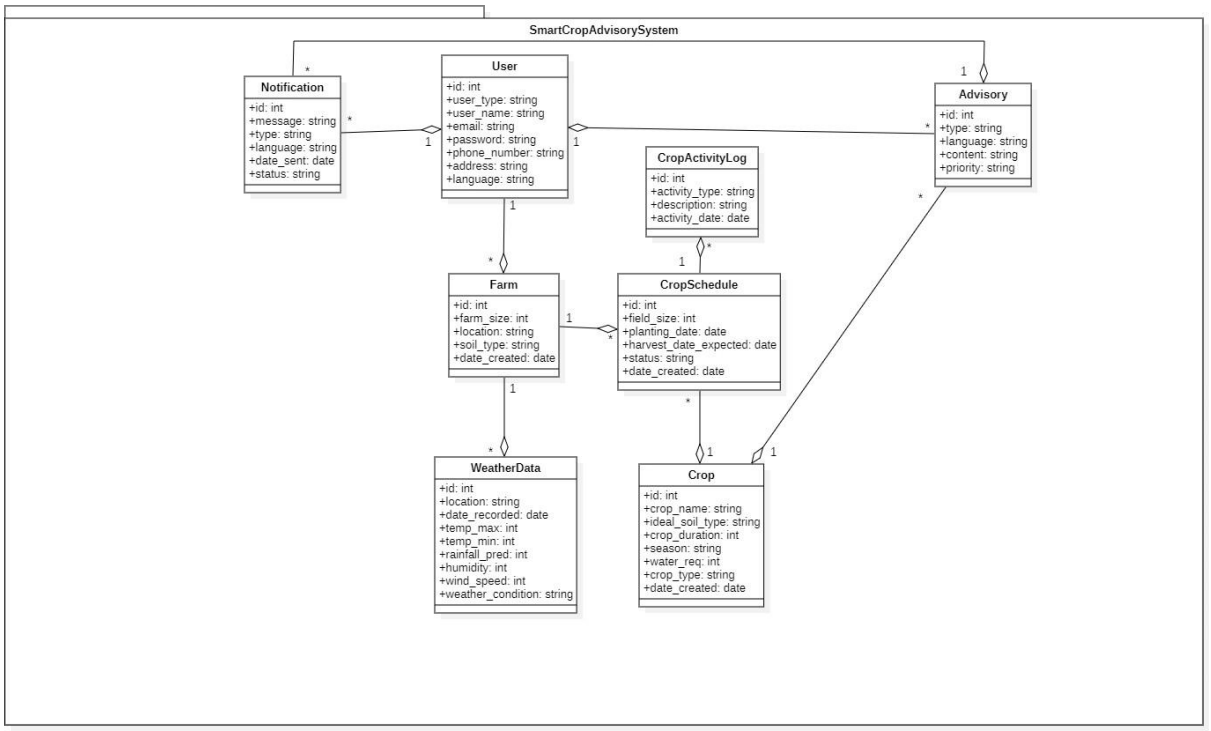
- Include:

    - RegisterOrLogin is included in most use cases since login is required before accessing features.
    - ViewWeatherData is included in GenerateAdvisories, since weather information is necessary for advisory creation.

- Extend:

    - ViewAdvisories extends ReceiveNotifications, as advisories are one type of notification.

CLASS DIAGRAM:



The class diagram of the Smart Crop Advisory System models the main entities, their attributes, and the relationships between them. It provides a structural view of how data is organized and connected within the system.

1. User

- Represents the person using the system.
- Attributes include user_id, user_type (farmer or advisor), user_name, email, password, phone_number, address, and language_preference.
- A single user can own multiple farms and can also generate or receive advisories and notifications.

2. Farm

- Represents agricultural land owned by a user.
- Attributes include farm_id, farm_size, location, soil_type, and date_created.
- A farm can have multiple crop schedules and weather data records.

3. Crop

- Defines the characteristics of a particular crop.
- Attributes include crop_id, crop_name, ideal_soil_type, crop_duration, season, water_requirement, crop_type, and date_created.
- A crop can be associated with multiple crop schedules and advisories.

4. CropSchedule

- Represents the schedule of planting and harvesting crops on a farm.
- Attributes include schedule_id, field_size, planting_date, harvest_date_expected, status, and date_created.
- Each schedule belongs to one farm and one crop but can generate multiple crop activity logs.

5. CropActivityLog

- Records day-to-day activities carried out on crops.
- Attributes include log_id, activity_type, description, and activity_date.
- Each log is linked to a single crop schedule.

6. WeatherData

- Stores weather information relevant to farms.
- Attributes include weather_id, location, date_recorded, temp_max, temp_min, rainfall_prediction, humidity, wind_speed, and weather_condition.
- A farm can have multiple weather data entries to support decision-making.

7. Advisory

- Represents expert advice or recommendations provided to users.
- Attributes include advisory_id, advisory_type, language, content, and priority.
- Advisories are linked to crops and are associated with the user who created them and the user who receives them.

8. Notification

- Represents system alerts or messages sent to users.
- Attributes include notification_id, message, type, language, date_sent, and status.
- Notifications are linked to advisories and sent to specific users.

Relationships:

- User–Farm (1..*): One user can manage multiple farms.
- Farm–CropSchedule (1..*): Each farm can have many crop schedules.
- CropSchedule–Crop (1..1): Each schedule is associated with one crop.
- CropSchedule–CropActivityLog (1..*): A schedule can generate many activity logs.
- Farm–WeatherData (1..*): Each farm can have multiple weather data records.
- Crop–Advisory (*..1): Advisories are linked to a crop.
- User–Advisory (1..*): Users (advisors) create advisories for farmers.
- User–Notification (1..*): Users receive multiple notifications.
- Advisory–Notification (1..*): Each advisory can generate notifications.