Project Deliverable 3

Instructions and Template:

Section 1 (5 points):

Include the five Use Case Scenarios that your team will move forward with.

1. **"Create profile"**

Main Success Scenario:

1. User selects "Register."
2. User fills in personal details, including email and password.
3. User inputs dietary preferences and health goals.
4. System validates and saves the information.
5. System confirms account creation.

Alternative Scenarios:

2. a) If the email is already in use, the system prompts for another email.
3. a) If the user exits without completing the profile, the system saves the information that the user already entered.
3. b) If dietary preferences are incomplete, the system requests more information.
4. a) If there's an error in saving user preferences, an error message is displayed.

2. **"Generate meal"**

Main Success Scenario:

1. User initiates "Generate Meal."
2. System recommends three distinct meal options to the user based on their profile and past dining history.
3. User selects one of the three recommended meals.
4. System offers a seamless transition to an existing food delivery service for ordering.

Alternative Scenarios:

3. a) If the recommended meals are not satisfactory, the user requests three new options.
4. a) If there's an issue with a particular food delivery service, the system provides alternative services.

3. **“Schedule Meal Plan”**

Main Success Scenario:
1) User navigates to the "Schedule Meal Plans".
2) User selects meal options for each day up to a week in advance.
3) System calls the recommendation algorithm to assist the user in selecting meals.
4) User confirms the meal plan schedule.
5) System sends reminder notifications to the user for meals based on their scheduled meal plans.

Alternative Scenarios:
5. a) If the user deviates from the schedule, the system prompts the user to remake the schedule (repeating steps 2-5).

4. **“Track Nutritional Intake”**

Main success scenario:
1. The system logs each meal consumed from the generated meal plan with complete nutritional information.
2. System updates the user's nutritional intake dashboard in real-time, showing calories, macros, and micronutrients.
3. Provides weekly summaries and insights into eating habits, with suggestions for Improvement.

Alternative Scenarios:
1a. When having a meal not recommended by the system, the user can manually log the meal information to accurately track nutrition intake.

5. **“Adjust Health Goals and Preferences"**

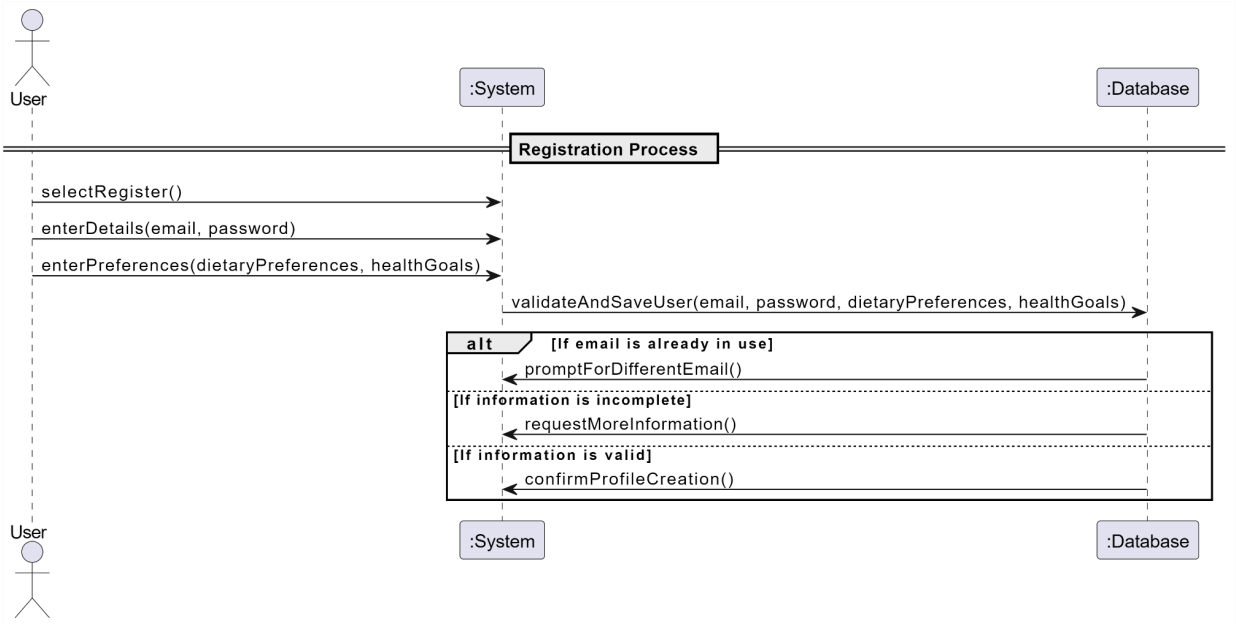
Main Success Scenario:
1. User accesses profile settings.
2. User selects the option to update dietary preferences or health goals.
3. System displays current settings and offers editable fields.
4. User submits changes.
5. System updates profile and confirms changes.

Extensions:
4a. If new preferences conflict with existing meal plans, offer to regenerate plans.

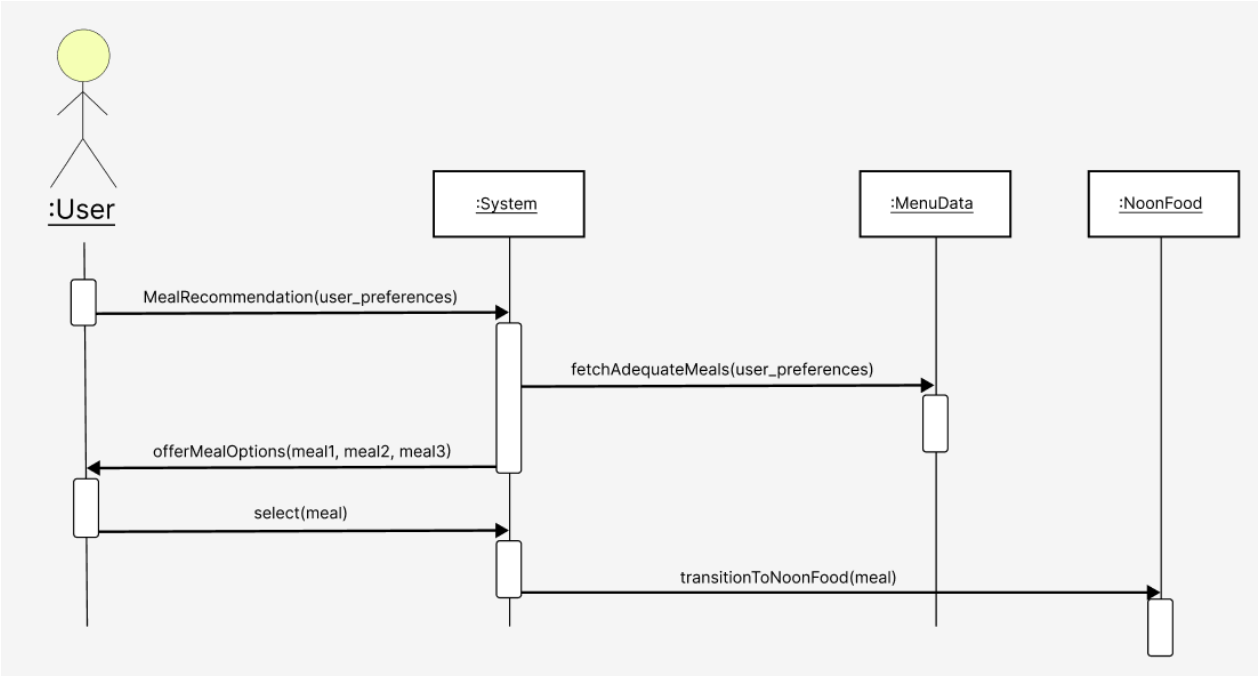
Section 2 (10 points):

System Sequence Diagram (SSD): Create 5 System Sequence Diagrams that illustrate the main success scenarios of the selected use cases. The SSDs should clearly depict the interactions between the actor(s) and the system, showcasing the sequence of messages exchanged during the use case execution.

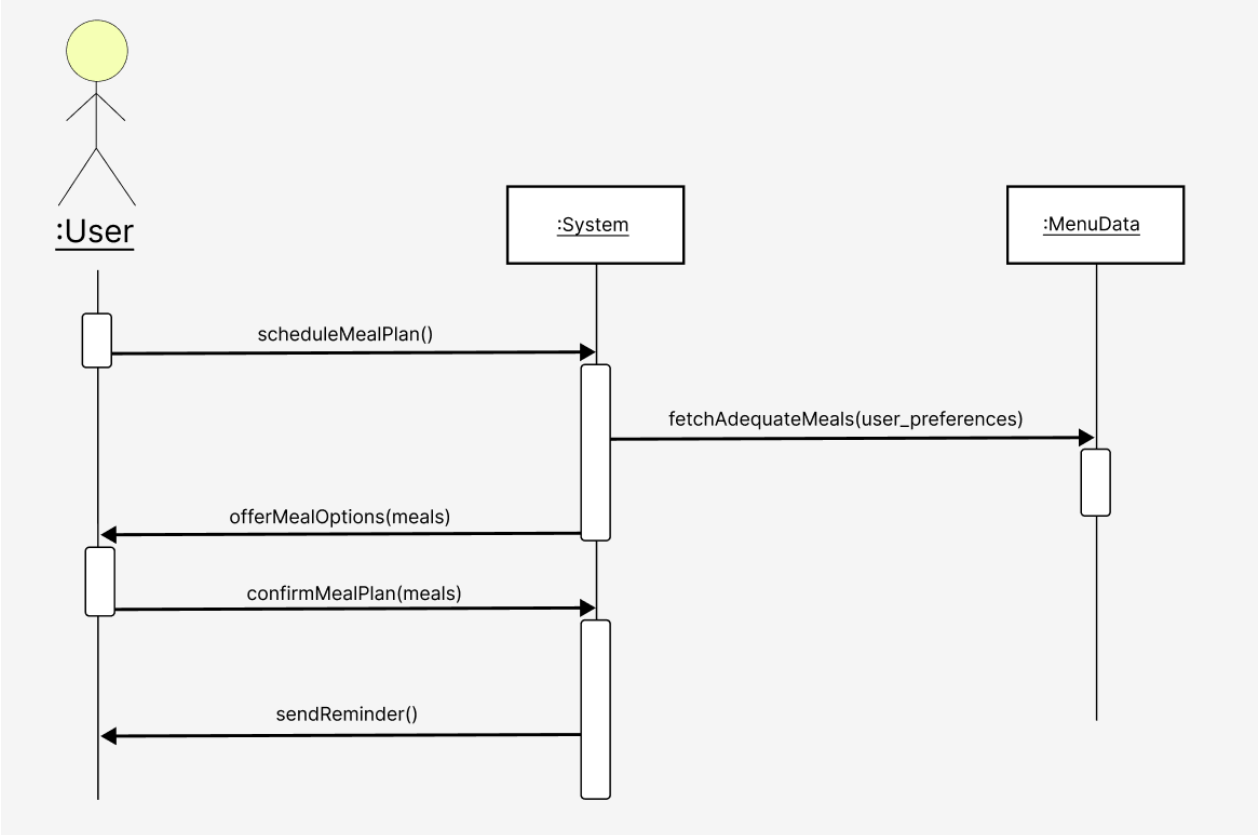
1. Create Profile



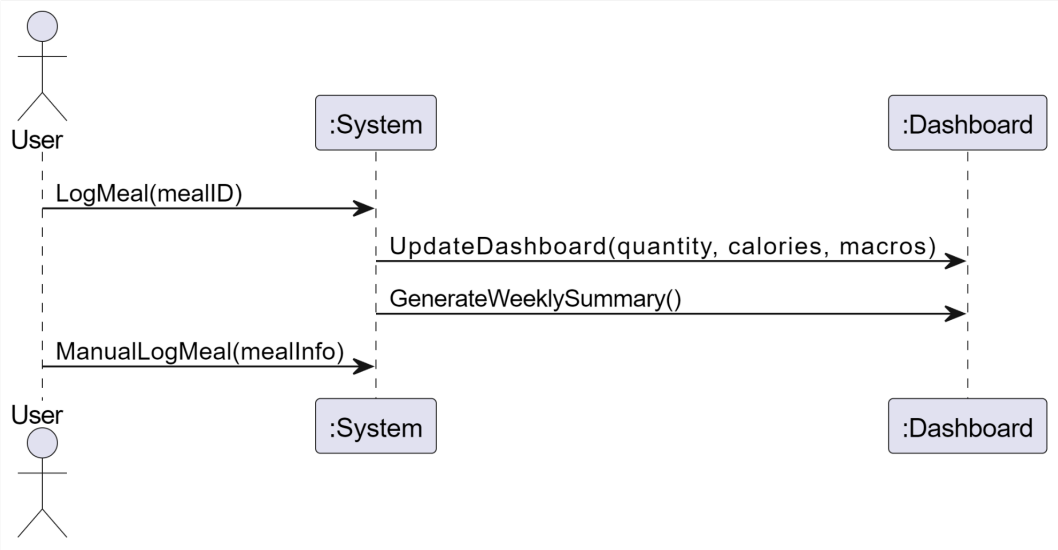
2. Generate Meal



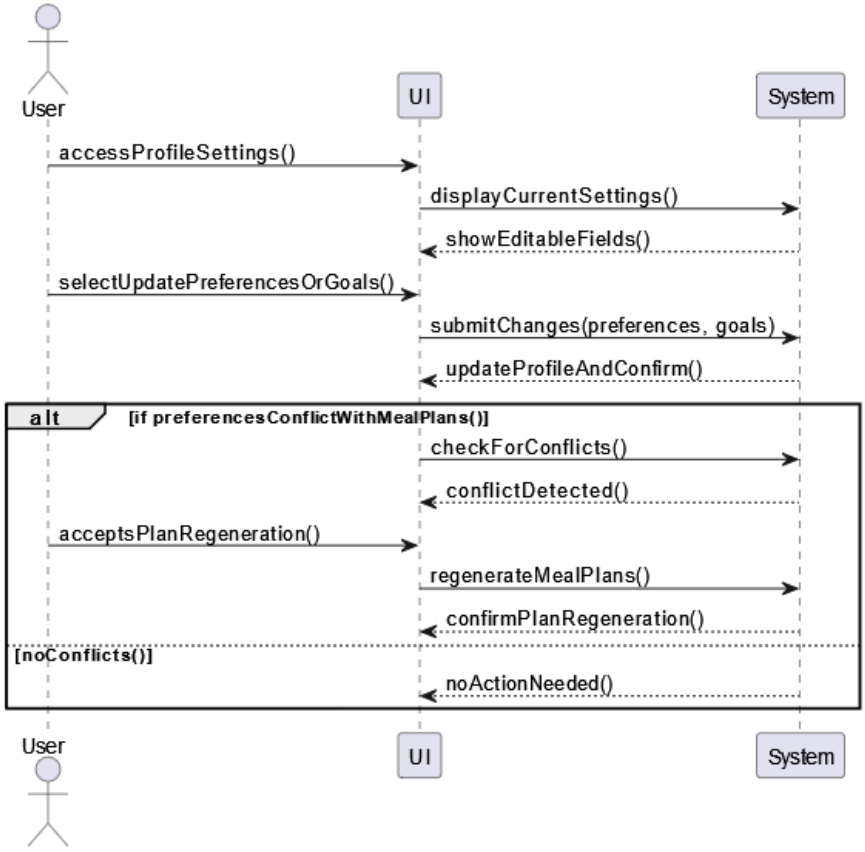
3. Schedule Meal Plan



4. Track Nutritional Intake

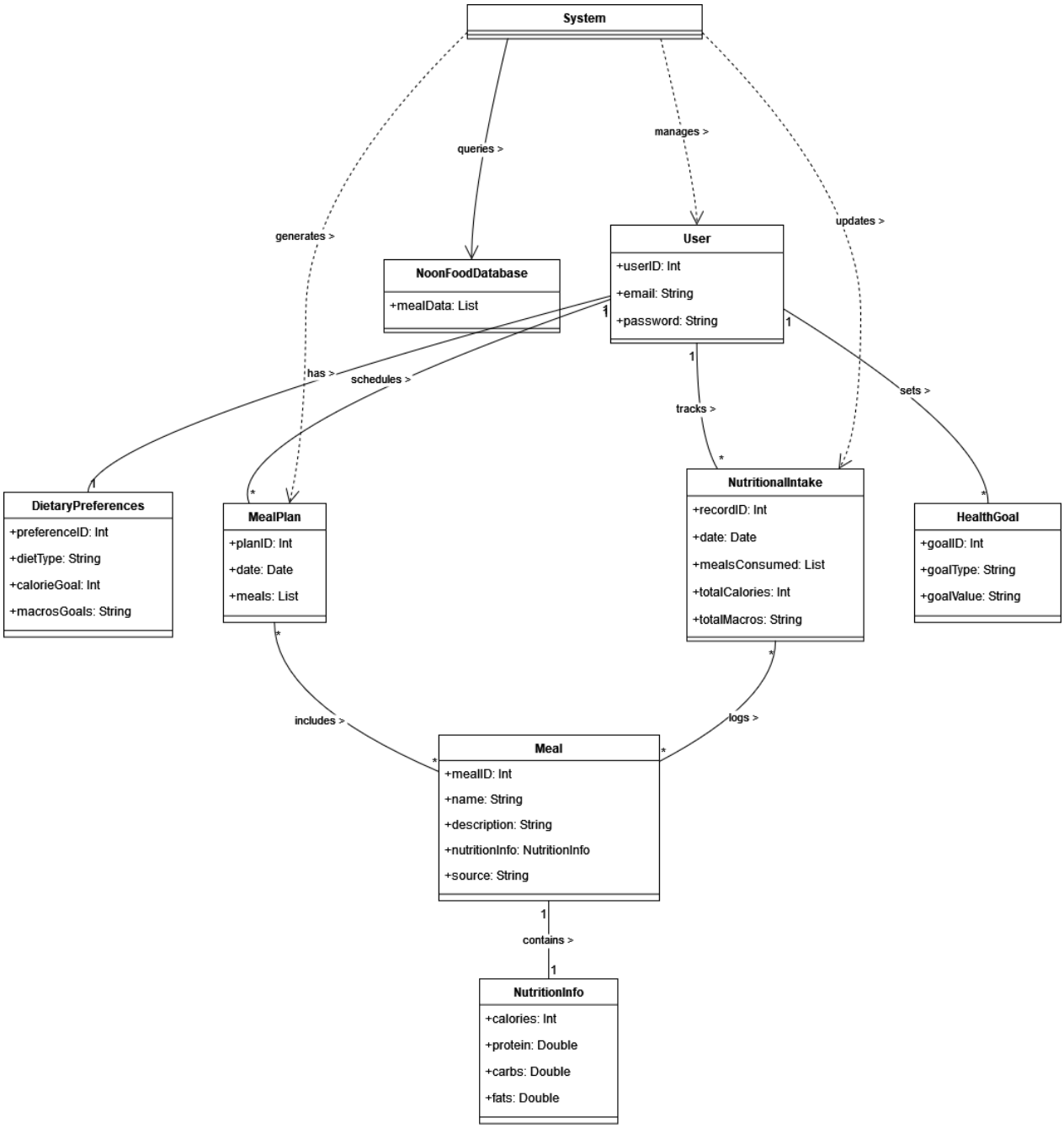


5. Adjust Health Goals and Preferences



Section 3 (10 points):

Domain Model: Develop one domain model that encompasses the fundamental concepts and associations relevant to the chosen use case scenarios. The domain model should include all significant concepts, their attributes along with data types, and associations. Each association within the domain model should be well-defined with a name and multiplicity.



Section 4 (15 points):

Operation Contracts: Based on the SSDs, write different operation contracts for the main significant operations using the provided template (at least five). In the post-conditions section of the operation contract, explicitly describe any of the following: the creation of an object instance, the formation of an association, or the modification of an attribute.

1. Create Profile

Operation Name: validateAndSaveUser

Responsibilities:

- Validates the user's email
- Creates a profile if validated and stores in database
- Saves dietary preferences and health goals

Pre-Conditions:

The user has entered their email, password, dietary preferences, and health goals.

Post-Conditions:

Object Creation: If the information is valid and the email is not already in use, a new instance of the User object is created in the database.

Attribute Modification: The new User object's attributes for email, password, dietaryPreferences, and healthGoals are set based on the provided information.

Association Formation: If dietary preferences include specific dietary goals (e.g., vegan, low-carb), associations between the User object and DietaryPreference objects representing these goals are formed in the system.

2. **GenerateMeal(user_preferences)**

Responsibility: The system creates 3 meal options for the user based on their preferences, goals, and restrictions.

Pre-conditions: User has created a profile and system has access to the database.

Post-conditions:

- *Meal*, 3, were created and initialized.
- The three instances of *Meal* were associated with their respective *NutritionalInfo*.
- The three instances of *Meal* were associated with the *RecommendationHandler*.

3. ScheduleMealPlan()

Responsibilities:

- Allows the user to schedule meal plans for up to a week in advance.
- Sends reminder notifications to the user based on their scheduled meal plan.
- Prompts the user to remake the schedule if they deviate from the original plan.

Pre-conditions: user has created a profile

Post-conditions:

- an instance of *Meal Plan* was created
- all instances of the *Meals* the user selected were associated with *Meal Plan*

4. Track Nutritional Intake
Operation Name: updateNutritionalDashboard

Responsibilities: Logs each meal consumed by the user, updates the nutritional intake dashboard with current data including calories, macros, and micronutrients, and generates weekly summaries with dietary suggestions.

Pre-Conditions:
The user is registered and has an active profile.
The meal is part of the system's meal plan or has been manually added by the user with complete nutritional information.

Post-Conditions:

Object Creation: A new NutritionalLog object is created for the logged meal, containing the meal's nutritional information.
Attribute Modification: The user's NutritionalDashboard is updated to reflect the latest intake of calories, macros, and micronutrients based on the newly logged meal.
Association Formation: The newly created NutritionalLog object is associated with the user's profile, indicating that this meal has been consumed by the user.

5. Operation Name: updateHealthGoalsAndPreferences(userID: Int, dietaryPreferences: DietaryPreferences, healthGoals: HealthGoal)

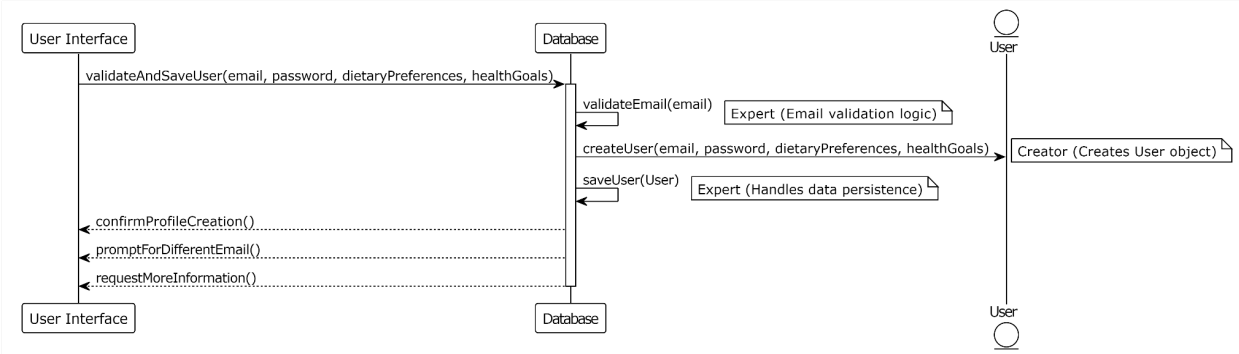
- Responsibilities:
    1. Update the user's dietary preferences and health goals in their profile.
    2. Display current settings and offer editable fields for updates.
    3. Validate and save the new preferences and goals.
    4. If new preferences conflict with existing meal plans, offer options to regenerate plans.
    5. Confirm the updates to the user.
- Pre-Conditions:
    1. The user identified by userID is registered and has an active profile.
    2. The user has navigated to the profile settings area and chosen to update dietary preferences or health goals.
- Post-Conditions:

1. Object Creation: Not applicable unless new dietary preferences or health goals are considered separate objects within the system, in which case, new instances of these would be created.
2. Attribute Modification:
    - The DietaryPreferences and HealthGoal attributes of the User object identified by userID are updated with the new information provided.
    - The system's response to potential conflicts with existing meal plans is logged, and suggestions for regeneration are offered to the user.
3. Association Formation:
    - If new instances of DietaryPreferences or HealthGoal were created, these are now associated with the user's profile, replacing or augmenting the existing associations.
    - If the system offers to regenerate meal plans due to conflicts with new preferences, and the user accepts, the association between the user and their old meal plans is updated to reflect the newly generated plans.

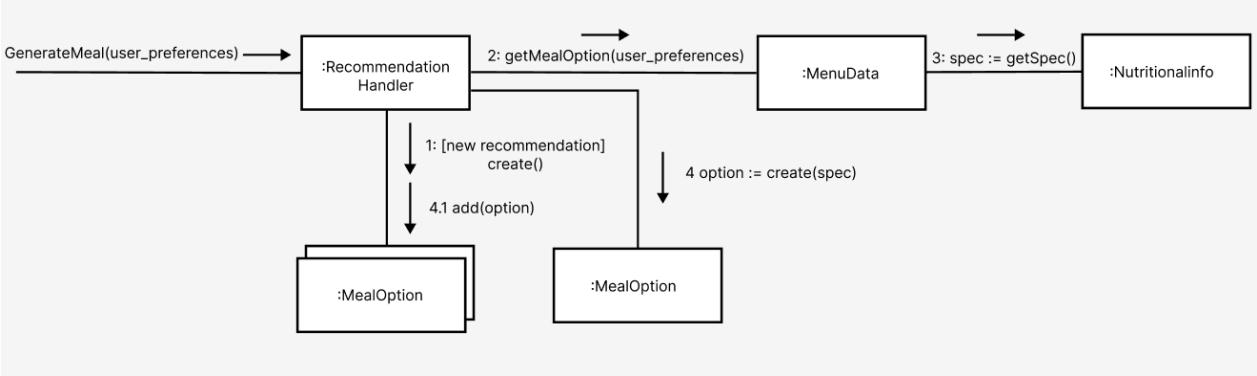
Section 5 (20 points):

UML Interaction Diagram: Utilize the operation contracts developed in the previous step as a reference. Create a UML interaction diagrams (at least five) that visualizes the interactions between objects during the execution of the selected operation. Annotate the messages in the diagram with GRASP patterns such as Expert, Creator, etc., where applicable.

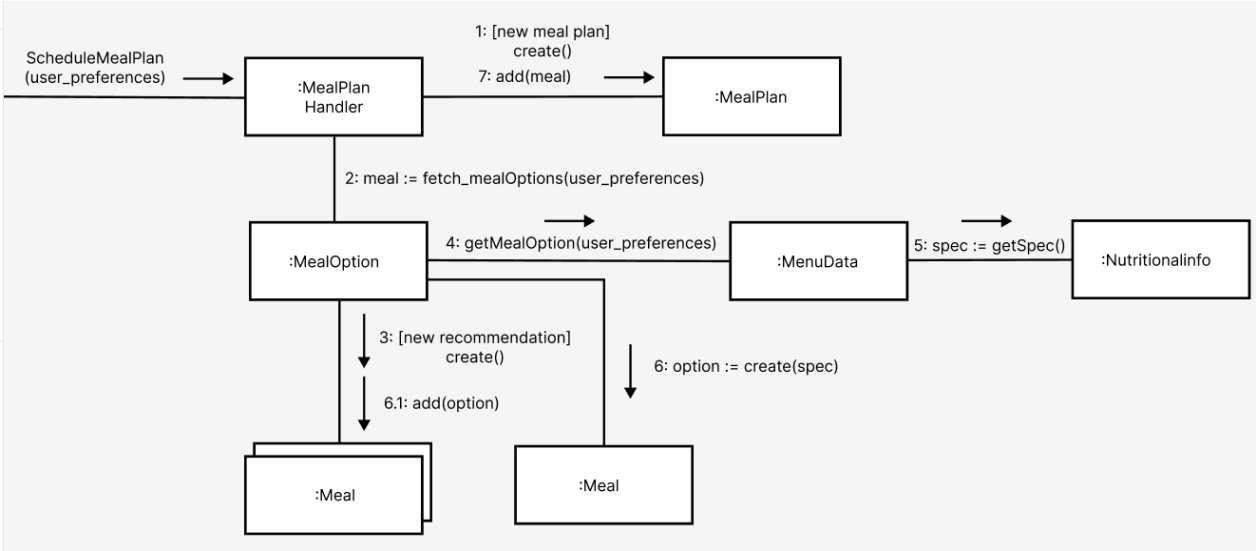
1. Create Profile



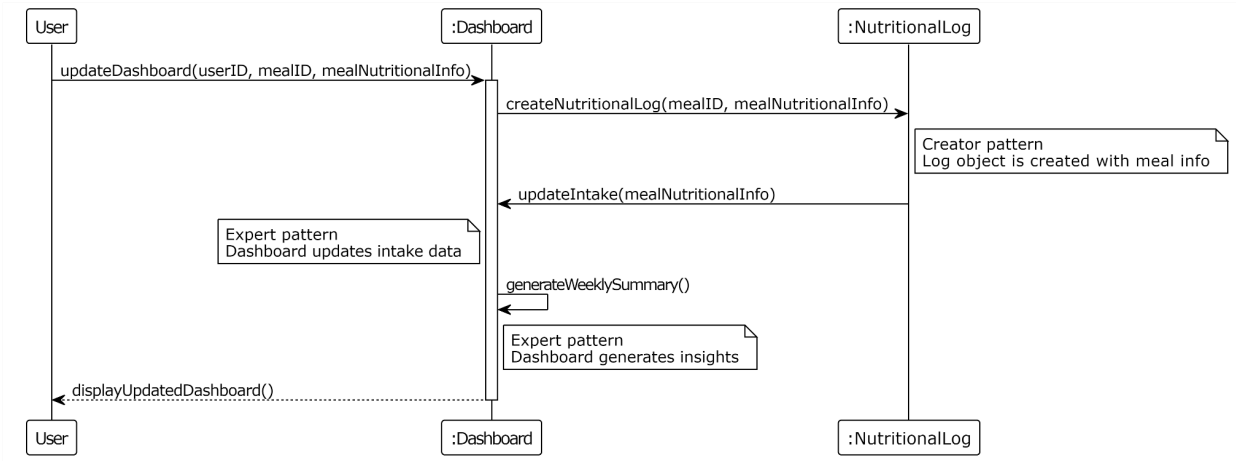
2. Generate Meal:



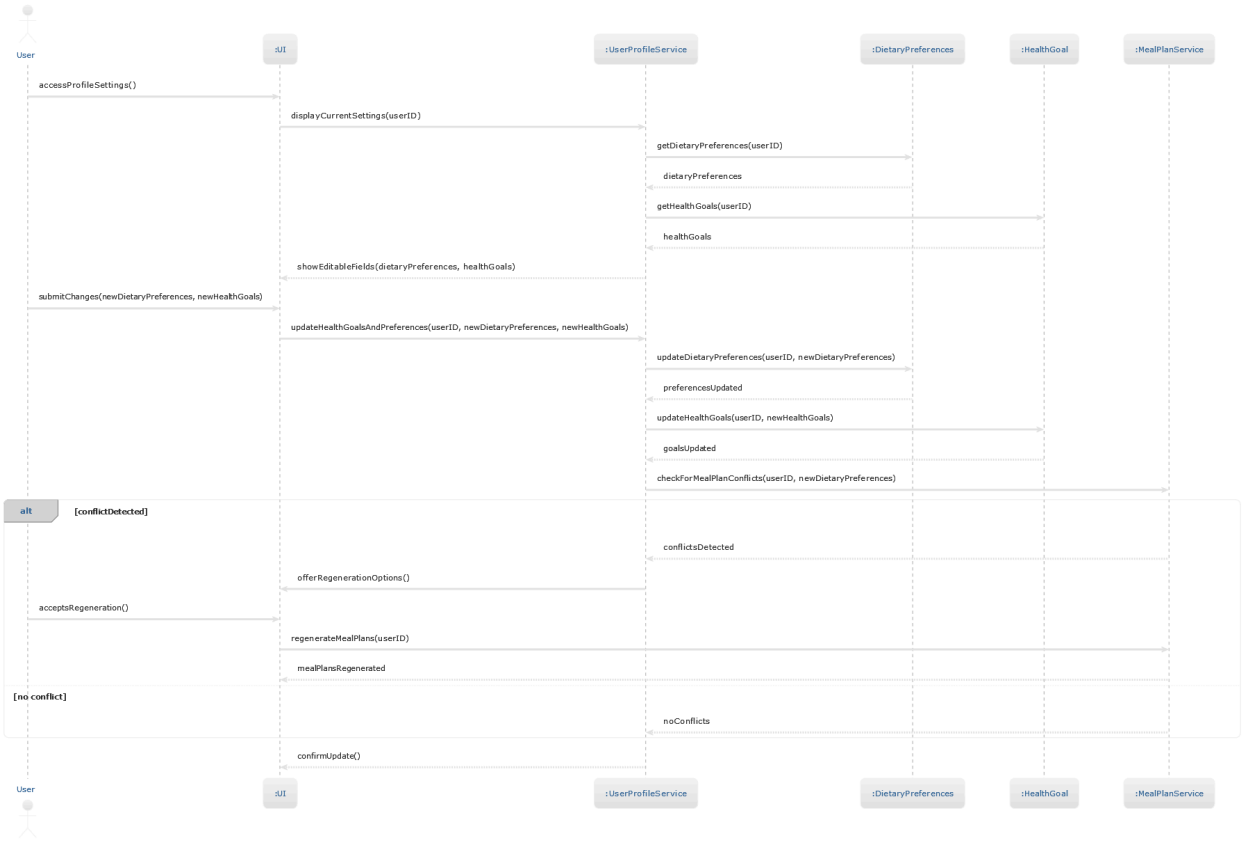
3. Schedule Meal Plan:



4. Track Nutritional Intake:

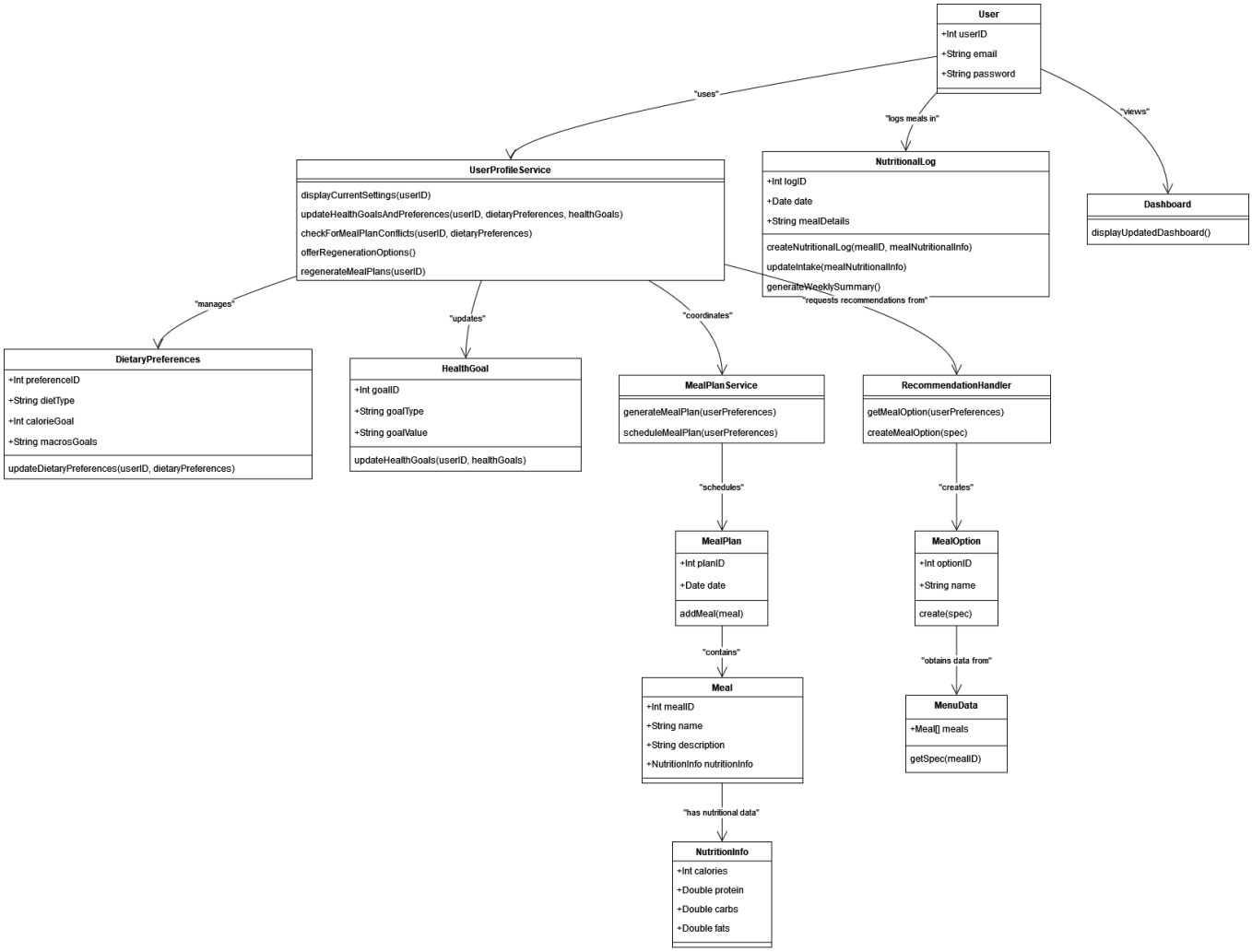


5. Update Health Preferences



Section 6 (20 points):

Bounded by the domain model, operation contracts and the interaction diagrams, create the final class diagram (one class diagram) that you will move forward with for this system.



Section 7 (20 pints):

Include the User Interface (UI) prototype screens of your application. You need to include at least two different screens.