Team 9
Developing a Personalized Health and Fitness Coach
Phase II - Analysis

1. Requirements Gathering

a. Gathering Requirements

i. Observation

Several online resources were examined to understand the landscape of currently available fitness/wellness apps and activity trackers, as well as the main attractions and issues faced by users. 222

- Existing Wearable app: Introducing the New Garmin Connect IQ App
- Guided meditation: Free Five Minute Guided Meditation with Eve
- Users experiencing difficulties with data sync between multiple devices: Fitbit Versa or Sense: "Something went wrong" Can't Connect, Pair …

ii. Brainstorming

Ideas for requirements that a GenAI-based personalized fitness coach app should have were discussed among team members in a 10-minute in-person brainstorm session. The key takeaways were:

- The system should be able to handle a large number of users and data.
- The system should have APIs for integrating with the wearables.
- The system should provide adaptable plans that change based on the feedback and progress.
- Users must provide real-time feedback and the system should provide AI driven suggestions for performance improvement.
- Users must have fine-grained control over what personal data is used by the AI.
- Opt-out options should be available for users who do not want their data used for AI suggestions.
- Users ability to fine-tune Gen-AI privacy settings is paramount
- The app must be compliant with all local laws and data policies
- The UI should have accessibility features to make it more usable to a wider range of users

iii. Research

The following research papers were found to contain information conducive to the development of a robust set of user metrics and features for our app:

1. Fitness App Market Size, Share & Trends Analysis Report By Type (Exercise & Weight Loss, Diet & Nutrition, Activity Tracking), By Platform (Android, iOS, Others), By Device (Smartphones, Tablets), By Region, And Segment Forecasts, 2024 - 2030
2. Importance-performance analysis in fitness apps. A study from the viewpoint of gender and age
3. Motivating consumers for health and fitness: The role of app features
4. What technological features are used in smartphone apps that promote physical activity? A review and content analysis

b. Epics and User Stories

i. UI/UX:

- As a user, I want daily wellness reminders and notifications to appear at appropriate times so that I stay motivated to follow my workout plan.
- As a user, I would like to easily navigate around my fitness app without disrupting my workout session, and be able to easily track my progress.
- As a user, the app should have the track and indication levels of various health features as graphical bars with appropriate icons for easy identification.
- As a developer, the app should support accessibility features such as high contrast themes and text sizing options so it can inclusively cater to a larger demographic

ii. AI integration:

1. As a health-conscious individual, I want the app to suggest diet plans based on my goals and preferences so that I can support my physical activities with proper nutrition.
2. As a fitness enthusiast, I would like the help of AI integration to recommend alternative workouts to me if I can't do the one suggested.
3. Incase of monitoring the app via mobile as well as the smart watch, the automated sync between the devices has to happen for easier multi device access.
4. As a user, I am concerned about the use of my sensitive personal data to generate suggestions using a cloud AI model, so I require fine-grained control and opt-out options in the app

iii. Security and Privacy

- As a user, I want to have control of what data is shared with whom, so that I can make sure my data is handled appropriately.
- Incase of inactivity, automatic logout and session timeouts must occur to maximize account security.
- Maintain activity log to identify and resolve the potential incidents.
- When I forget my user login, I want my password recovery to be smooth and my app to sign out of all the devices I'm logged into.
- As a developer, I want to ensure any data retention is compliant with the local laws and regulations (GDPR)

iv. Health and Wellness features

1. As a user, I want the application to provide guided meditation and relaxation exercises to improve mental health.
2. As a user, I want 24x7 Customer support to help resolve problems whenever I need.
3. As a user, I would like to see an estimated stress level during the day and reminders to pause and relax when appropriate

v. System compatibility/integration

1. The app should be compatible for use against various OS, screen size, resolution and devices.
2. There should be less than 100 millisecond latency in generating metrics/visualizations

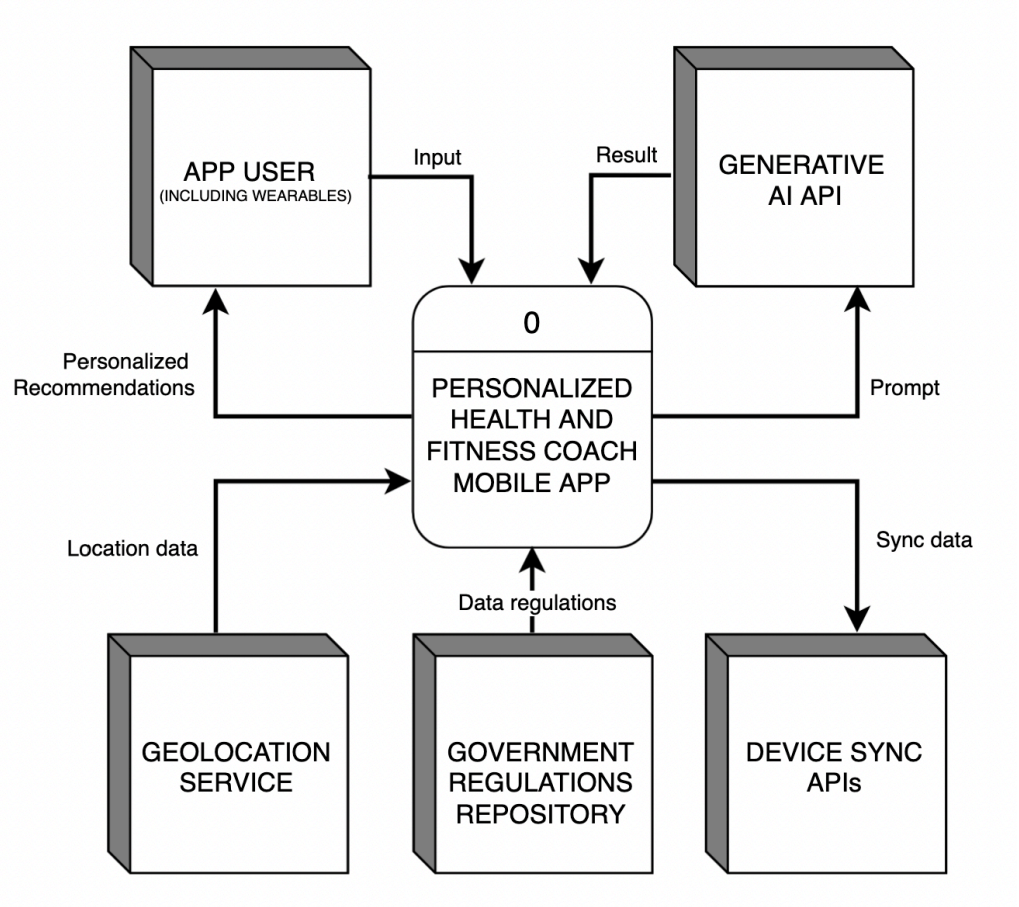
c. <u>Differentiating between functional and non-functional requirements:</u>

Category/Epic	Functional Requirements	Non-Functional Requirements
UI/UX	● As a user, I want daily wellness reminders and notifications to appear at appropriate times so that I stay motivated to follow my workout plan ● As a user, I would like to easily navigate around my fitness app without disrupting my workout session, and be able to easily track my progress ● As a user, the app should have the track and indication levels of various health features as graphical bars with appropriate icons for easy identification.	● As a developer, the app should support accessibility features such as high contrast themes and text sizing options so it can inclusively cater to a larger demographic
AI integration	● Incase of monitoring the app via mobile as well as the smart watch, the automated sync between the devices has to happen for easier multi device access ● As a fitness enthusiast, I would like the help of AI integration to recommend alternative workouts to me if I can't do the one suggested. ● As a user, I am concerned about the use of my sensitive personal data to generate suggestions using a cloud AI model, so I require fine-grained control and opt-out options in the app	
Security and Privacy	● Incase of inactivity, automatic logout and session timeouts must occur to maximize account security.	● Maintain activity log to identify and resolve the potential incidents. ● As a user, I want to have control of what data is shared with whom, so that I can make sure my data is handled appropriately. ● When I forget my user login, I want my

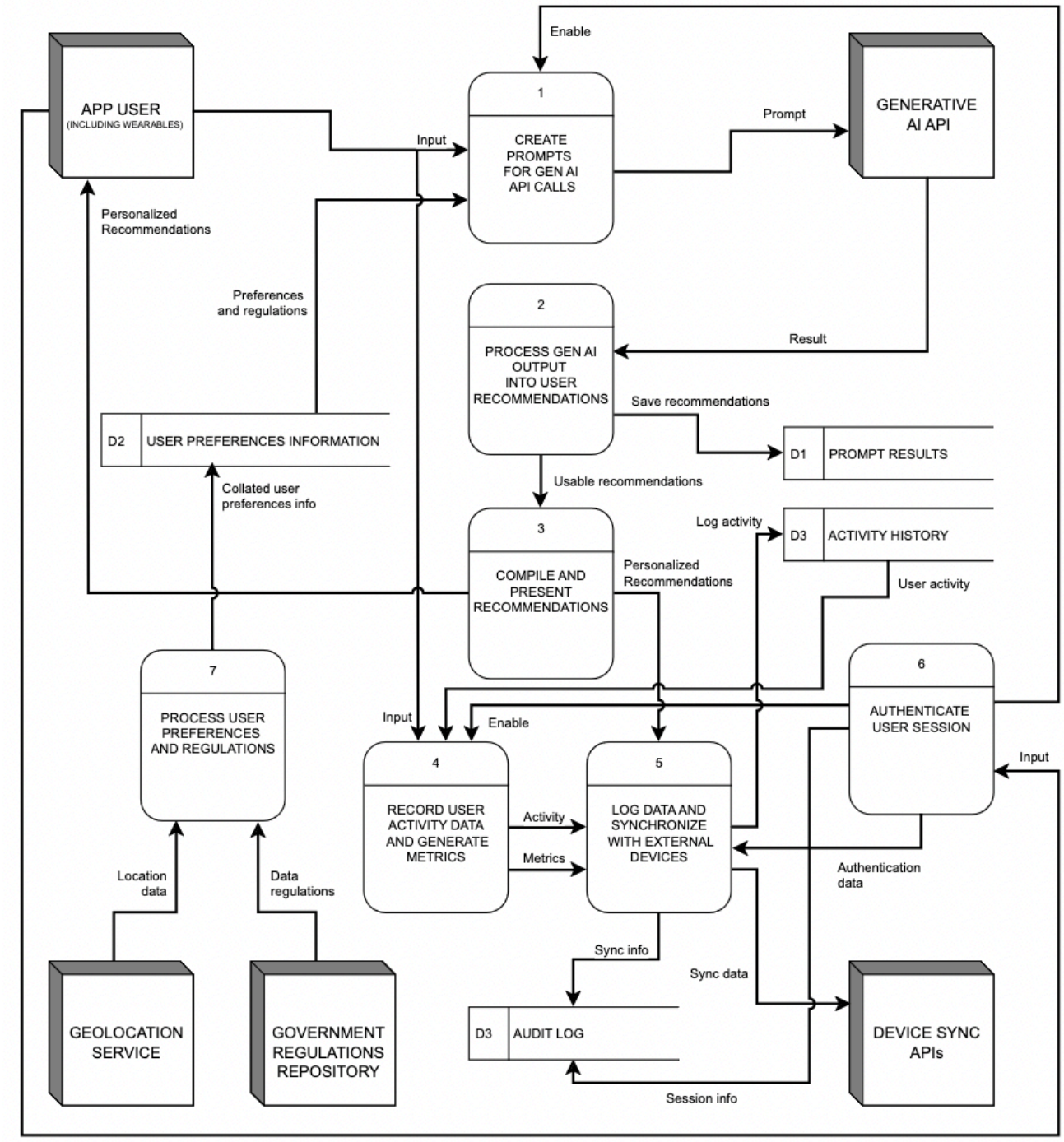
		password recovery to be smooth and my app to sign out of all the devices I'm logged into. ● As a developer, I want to ensure any data retention is compliant with the local laws and regulations (GDPR)
Health and Wellness features	● As a user, I want 24x7 Customer support to help resolve problems whenever I need. ● As a user, I would like to see an estimated stress level during the day and reminders to pause and relax when appropriate	● 1.As a user, I want 24x7 Customer support to help resolve problems whenever I need.
System compatibility/integration	● As a user, I would like to get workout and diet plan suggestions within 100 millisecond latency.	● The app should be compatible for use against various OS, screen size, resolution and devices. ● There should be less than 100 millisecond latency in generating metrics/visualizations.

2. Data Flow Diagrams

a. Context Diagram

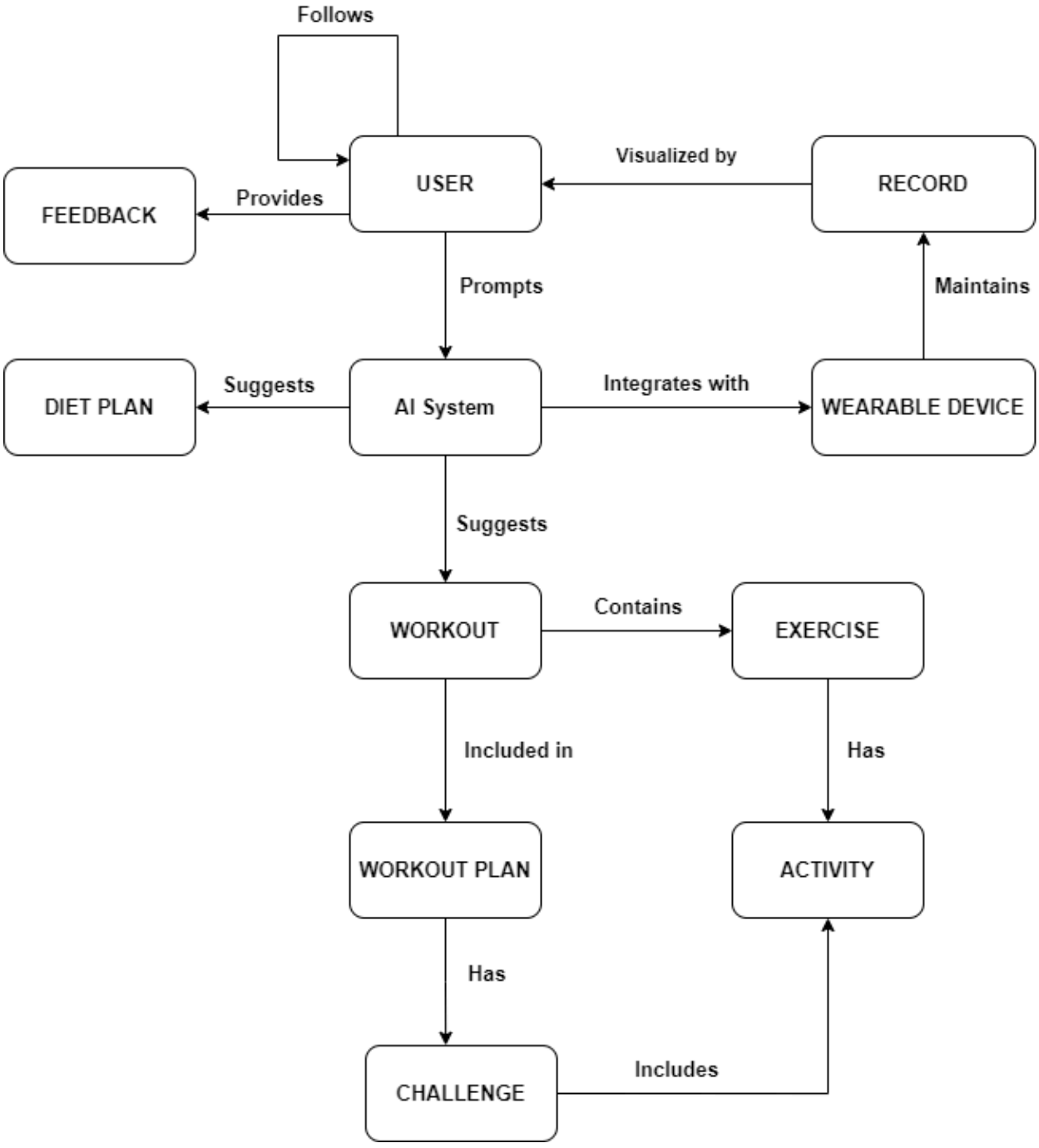


b. DFD 0 Diagram



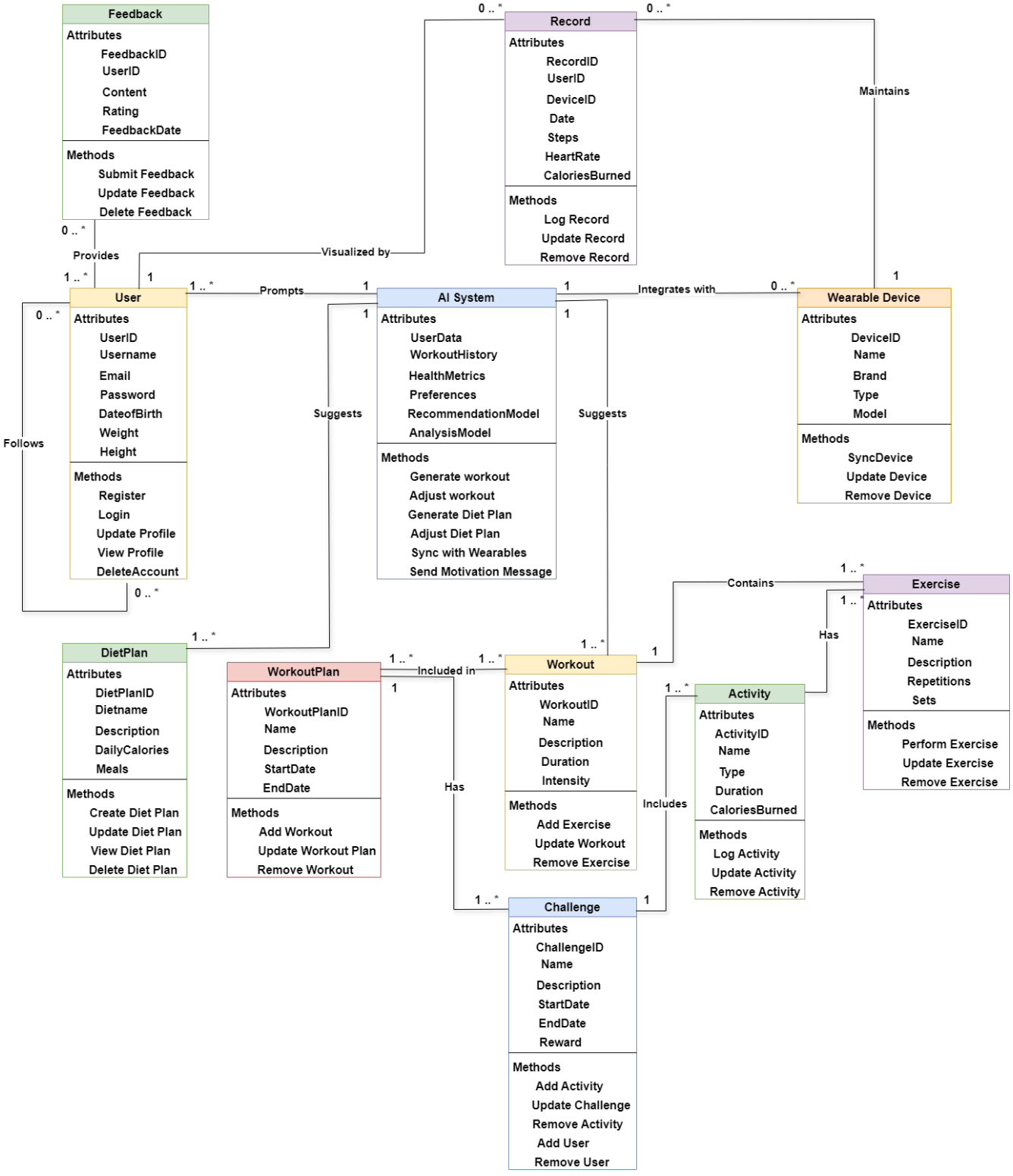
3. Object Modeling

a. Object Relationship Diagram



b. Use case diagram

c. Class diagram



d. Sequence diagram