Software Engineering
Software Requirements Specification (SRS) Document

NutriLog: Smart Nutrition

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0.1.0

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In Adherence to the UNCG Academic Integrity Policy

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1. Introduction

1.1. Purpose

The goal of NutriLog: Smart Nutrition is to create a smart-food tracking application that allows users to see information about the foods they consume to provide guidance on nutritional education. The app will advise users on the Nutritional values of the foods they consume so that users can make informed decisions on the foods they eat, ultimately leading to better health outcomes.

1.2. Document Conventions

The purpose of this Software Requirements Document (SDR) is to describe the client-view and developer view requirements for the Nutrilog: Smart Nutrition web application. In it, we will describe the system to a user and to a software developer. Client-oriented requirements will detail the system from the perspective of a regular user. The regular users of the system will be the administrator, the nutrition nutritionist, and the common user (i.e. adults or children). The requirements also include a description of the users of the system, such as adults or children, nutrition nutritionists, and the administrator. Developer-oriented requirements describe the system from the perspective of a software developer. The software requirements include detailed information about functional, data, performance, and other necessary requirements.

1.3. Definitions, Acronyms, and Abbreviations

Java	A programming language originally developed by James Gosling at Sun Microsystems. We will be using this language to build NutriLog.
.HTML	Hypertext Markup Language. This is the code that will be used to structure and design the web application and its content.
CSS	Cascading Style Sheets. This is the code that will be used to style the content of the web application.
SpringBoot	An open-source Java-based framework used to create a micro Service. This will be used to create and run our application.
MVC	Model-View-Controller. This is the architectural pattern that will be used to implement our system.
Spring Web	Will be used to build our web application by using Spring MVC. This is one of the dependencies of our system.
Thymeleaf	A modern server-side Java template engine for our web environment. This is one of the dependencies of our system.
IntelliJ IDEA	An integrated development environment (IDE) for Java. This is where our system will be created.
API	Application Programming Interface.
FDC API	An API that provides access from the USDA Global Branded Foods Database. This is where the core backend functionality will come from.

1.4. Intended Audience

The roles of stakeholders, developers, and project managers are all shared by the developers who created NutriLog: Carlos Villarreal, Michael DeHaan, and Salvador Macias. The user's role is that of anyone who wishes to use the service.

- Parts 1 and 2: Offer high-level overviews of the product that all roles may benefit from viewing.
- Part 3: Offers more detailed views for the developers and project managers.
- Parts 4 and 5: Offers views created based on user/customer specifications but within the SRS are meant for developers and project managers to implement these user-defined high-level requirements.

1.5. Project Scope

The goal of NutriLog is to offer individuals a comprehensive and easy-to-use platform to take control of their daily nutrition. This aligns with the goal of promoting health and well-being among users by enabling them to make informed food choices based on their personal goals.

The benefits of the project to individuals include:

- Enhancing food safety by flagging recipes that contain foods a user may be allergic to.
- Promoting overall well-being by ensuring users have a more nutritionally complete diet.
- Improving nutritional education by providing nutritionist services to users who need additional assistance.

1.6. Technology Challenges

The challenges from this project will be from frontend implementation and API integration. Every developer team member is familiar with Java and backend logic but not UX and UI development. The new technologies will be SpringBoot and integrating the Spoonacular API with it.

1.7. References

Academic integrity policy. Student Affairs. (2023, November 3). https://sa.uncg.edu/division-of-student-affairs/students/academic-resources/student-policy-handbook/academic-integrity-policy/

2. General Description

2.1. Product Features

The product features allow users to find recipes and save them and flag recipes they search for any potential ingredients they may be allergic to. The users are also able to request for nutritionist assistance allowing them to obtain help in creating a more healthy and balanced diet. The nutritionist can then create a meal plan based on the specific nutritional needs of the user. The admin can create new accounts and delete ones, generate reports, and view metadata.

2.2. User Class and Characteristics

Our application only expects our users to have prior knowledge of computers from using a web browser. NutriLog is intended for users with any background in nutrition, ranging from no prior nutritional knowledge to expert knowledge. A basic understanding of dietary components such as micro and macronutrients may be beneficial but is optional.

2.3. Operating Environment

This application is designed to operate on any modern web browser regardless of the device.

2.4. Constraints

Due to safety considerations and project scope, contact between nutritionists and users will not be instant.

2.5. Assumptions and Dependencies

The software will be dependent on Spring Boot, HTML, CSS, and Java. The software will also use the FDC API for searching and displaying recipes, and food items. The software will be developed within IntelliJ IDEA Ultimate.

3. Functional Requirements

3.1. Primary

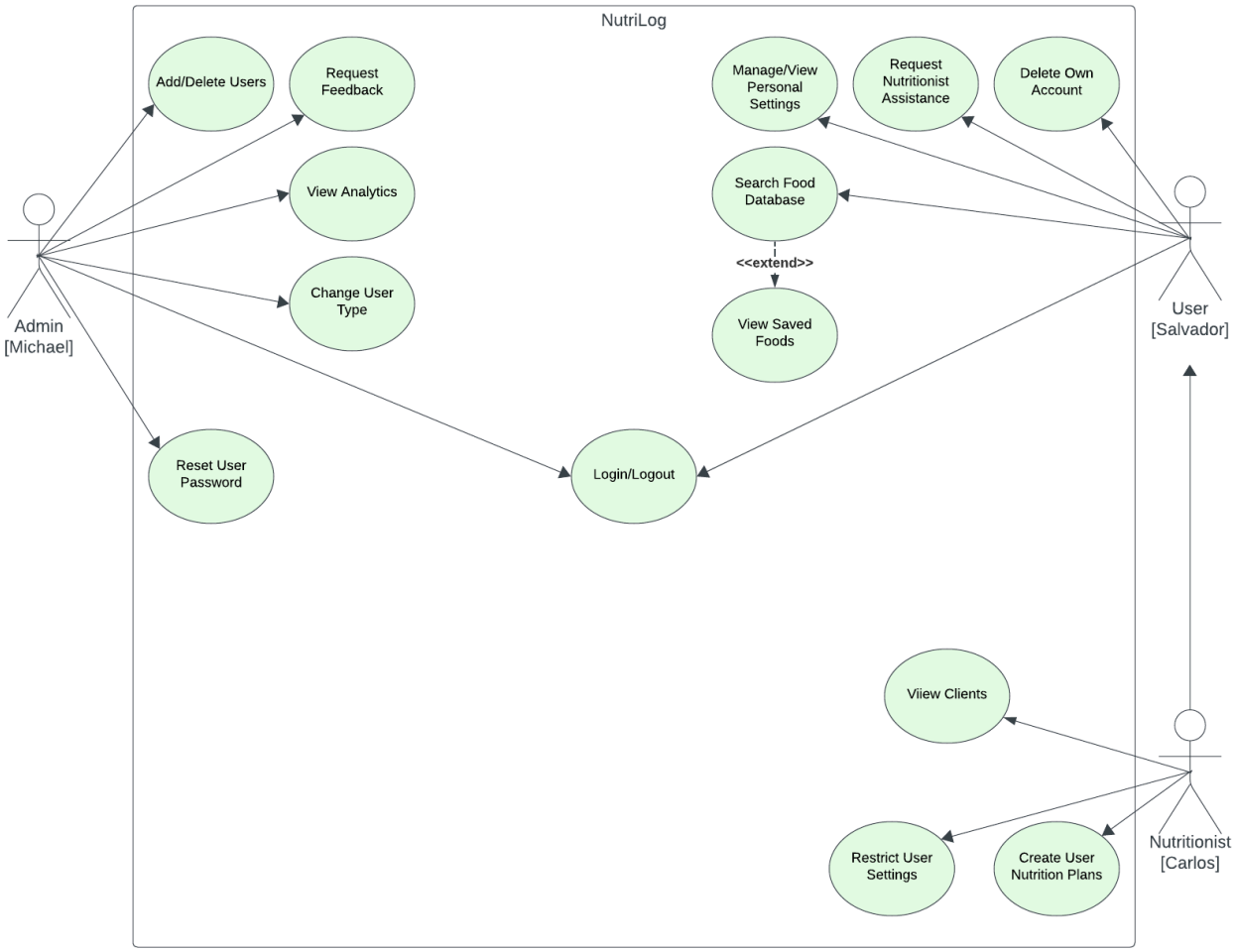
- FR0: The system will allow the user to enter food and food ingredients that they are allergic to. This information will then be used to create a list of allergy information for that particular user that will then be used to make recommendations for recipes and foods to try out.
- FR1: The system will allow the user to request nutritionist assistance. This will alert nutritionists that a user is requesting assistance.
- FR2: The system will allow a nutritionist to create a nutrition plan for a user based on what information a user gives for their specific dietary needs.
- FR3: The system will allow an administrator to generate reports.

3.2. Secondary

- All 3 different users will only be able to view their own information, and information suitable to the type of user they are.
- All users will have a username and password they can use to login to the system.

3.3. Use-Case Model

3.3.1. Use-Case Model Diagram



3.3.2. Use-Case Model Description

3.3.2.1. Actor: Admin (Michael DeHaan)

- **Delete User**: The manager can delete an existing user by using their user login ID.
- **Add New User**: The manager can create a new user and designate the type of user.
- **View Metadata**: The manager can view analytic data about users to see how they are using the app.

3.3.2.2. Actor: Nutritionist (Carlos Villarreal)

- **Create User Nutrition Plans**: The nutritionist will be able to create a Nutrition plan for a user who requests a nutrition plan.
- **Restrict User Settings**: The nutritionist can restrict the settings of a user based on certain criteria, such as their age. Children users will have less features than adult users.
- **Search/Save Recipe and Food Items:** The nutritionist will have the ability to search and save recipes that they find so that they can later make recommendations to users. The same ability will be granted to food items.

- **Add/Remove Nutritional Information:** The nutritionist will be able to add or remove nutritional information on the system. Nutritional information can be articles and posts talking about nutrition.

3.3.2.3. Actor: User (Salvador Macias)

- **Manage personal settings**: The user will be able to enter his name and allergy information along with any other relevant data to create a food plan.
- **Request Nutritionist assistance**: The user will be able to ask for assistance from a nutritionist.
- **Search/Save Recipe and Food Items**: The user will be able to search for and save recipes that they would like to try based on the relevant information they gave such as allergies.

3.3.3. Use-Case Model Scenarios

3.3.3.1. Actor: Admin (Michael DeHaan)

- **Use-Case Name**: Delete User
  - **Initial Assumption**: The admin has access to the app and the admin role.
  - **Normal**: The admin will enter the user's ID to a delete function.
  - **What Can Go Wrong**: The admin enters the wrong ID.
  - **Other Activities**: n/a
  - **System State on Completion**: The users will no longer be registered and the ID will be set as inactive. This will be reflected in the app metadata.
- **Use-Case Name**: Add New User
  - **Initial Assumption**: The admin has access to the app and the admin role.
  - **Normal**: The admin will enter the user's ID to a create function.
  - **What Can Go Wrong**: The admin enters an already existing ID.
  - **Other Activities**: n/a
  - **System State on Completion**: A new user will be established. The user ID will be added to the active ID list.
- **Use-Case Name**: View Metadata
  - **Initial Assumption**: The admin has access to the app and the admin role.
  - **Normal**: The admin will select a view to see various metadata about the app and its users.
  - **What Can Go Wrong**: n/a
  - **Other Activities**: The admin can create custom reports based on the metadata.
  - **System State on Completion**: No state change, view only.
- **Use-Case Name**: Add/Remove Nutritional Information
  - **Initial Assumption**: The admin has access to the web application and has the admin role.
  - **Normal**: The admin has the ability to search for and save articles and posts that talk about nutrition so that they appear on the system accessible to users.
  - **What Can Go Wrong**: n/a

- **Other Activities**: (Placeholder, details can be added later)
- **System State on Completion**: The saved articles and posts items are saved somewhere in the system so that they are accessible to users.

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3.3.3.2. Actor: Nutritionist (Carlos Villarreal)

- **Use-Case Name**: Create User Nutrition Plans
  - **Initial Assumption**: The nutritionist has access to the web application and has the nutritionist role.
  - **Normal**: The nutritionist will be able to create custom nutrition plans for users based on the feedback users give for what their dietary needs are.
  - **What Can Go Wrong**: User's dietary needs are not given to the nutritionist because they did not fill out a form of some type to give to the nutritionist. The nutritionist should have an "other" option.
    The user is unwilling to give health and dietary information necessary to create a custom nutrition plan. The nutritionist will then inform the user somehow that they are limited with the options they can give in a nutrition plan or that they are unable to create a suitable nutrition plan.
  - **Other Activities**: (Placeholder, details can be added later)
  - **System State on Completion**: The new nutrition plan is created and shown to the user somehow.
- **Use-Case Name**: Restrict User Settings
  - **Initial Assumption**: The nutritionist has access to the web application and has the nutritionist role.
  - **Normal**: The nutritionist is able to restrict the settings that a user can have based on certain user information, such as their age.
  - **What Can Go Wrong**: The nutritionist accidentally restricts the setting of an adult user. The nutritionist should have the ability to remove restrictions.
  - **Other Activities**: (Placeholder, details can be added later)
  - **System State on Completion**: The child user no longer has access to certain settings.
- **Use-Case Name**: Add/Remove Nutritional Information
  - **Initial Assumption**: The nutritionist has access to the web application and has the nutritionist role.
  - **Normal**: The nutritionist has the ability to search for and save articles and posts that talk about nutrition so that they appear on the system accessible to users.
  - **What Can Go Wrong**: n/a
  - **Other Activities**: (Placeholder, details can be added later)
  - **System State on Completion**: The saved articles and posts items are saved somewhere in the system so that they are accessible to users.

3.3.3.3. Actor: User (Salvador Macias)

- **Use-Case Name**: Manage personal settings

    - **Initial Assumption**: The user has access to the web browser and is logged in.
    - **Normal**: The user accesses and can modify his personal settings and information
    - **What Can Go Wrong**: The user accidentally enters incorrect information they will be able to edit and change their personal information.
    - **Other Activities**: (Placeholder, details can be added later)
    - **System State on Completion**: The user's information and details are saved in the system.
- **Use-Case Name**: Request Nutritionist assistance
    - **Initial Assumption**: The user has access to the application and is logged in.
    - **Normal**: The user is able to request assistance from a nutritionist.
    - **What Can Go Wrong**: N/A
    - **Other Activities**: (Placeholder, details can be added later)
    - **System State on Completion**: The nutritionist is notified that they have been requested for nutritionist assistance.
- **Use-Case Name**: Search food database.
    - **Initial Assumption**: The user has access to the application and is logged in.
    - **Normal**: The user is able to search the database using the API.
    - **What Can Go Wrong**: No results for what the user searches up it would display no results found.
    - **Other Activities**: (Placeholder, details can be added later)
    - **System State on Completion**: Results from the API are displayed to the user.

4. Technical Requirements

4.1. Interface Requirements

4.1.1. User Interfaces

There will be three different interfaces based on the three user types: Admin, nutritionist, and User. The app aims to be user-friendly and easily accessible. Upon logging in, each user will be directed to their homepage. Each page will have a navigation bar at the top of the viewport that can direct them to the subpages of their user type by using links and buttons. Input will be specified by using various HTML tags such as select, checkbox, etc. Styling will be done primarily through CSS and CSS templates.

4.1.2. Hardware Interfaces

The app will run locally on any modern web browser that is connected to the internet and has the ability to interact with web page components. This includes but is not limited to, smartphones, tablets, desktop computers, and laptops.

4.1.3. Communications Interfaces

It must be connected to the internet to connect to the FDC API. Local communication between nutritionists and users does not require an internet connection, but they must be on the same local network or machine. Communication between users, the FDC API, and nutritionists will all be done via HTTP.

4.1.4. Software Interfaces

We will use Spring Boot and ThymeLeaf to build the front end and Microsoft Excel for the backend database functionality. We will also use Spring Boot with Java to connect the front end to the back end.

5. Non-Functional Requirements

5.1. Performance Requirements

- The system should be able to work on all of the popular internet browsers, i.e. Chrome, Firefox, Edge, etc. (Memory requirements unknown as of now).
- A novice user may take anywhere between 5 and 10 minutes to manage dietary preferences and to save it to the system for the first time.
- An expert user may take 2-3 minutes to change their dietary preferences and save it to the system.

5.2. Safety Requirements

Disclaimer: Nutrilog is not intended to be a service for people that may suffer from eating disorders to get guidance on their diet. Those that suffer from eating disorders should always consult a doctor or other trained medical professional.

5.3. Security Requirements

- The system will be usable by all intended users: administrators, nutritionists, and users with accounts.
- Users without accounts can still access the system, but they will not have the same number of functionalities that users with accounts have.
- The system will allow only the administrator to have access to personal user information, such as name, age, address, etc.
- The system will allow nutritionists to have access to certain user information, such as contact info.

5.4. Software Quality Attributes

5.4.1. Availability

Available on all of the popular internet browsers. Requires internet connection to use.

5.4.2. Correctness

The software should accomplish its purpose and produce correct results under all expected conditions. Users should be able to look up a food database to find healthier foods and request assistance from a nutritionist whenever they need it.

5.4.3. Maintainability

The codebase should be well-organized, documented, and modular to facilitate ease of maintenance. This involves clear coding standards, comments, and adherence to best practices to allow for efficient updates and bug fixes.

5.4.4. Reusability

Components of the software should be designed in a modular fashion to promote reusability across different parts of the application or in future projects.

5.4.5. Portability

We intend for our software to be available on all web browsers, so anyone with a laptop or tablet that has access to the internet should be able to access the system.

5.5. Process Requirements

5.5.1. Development Process Used

Nutrilog: Smart Nutrition's development follows the Iterative Model. The process so far has been initial planning (Project Proposal) and then listing the requirements of the software in a document. Throughout the process, we expect to come back to certain aspects, whether it be requirements, analysis and design, etc, and to keep continuously improving/changing aspects of the software as we go along.

5.5.2. Time Constraints

All 3 software developers have other obligations besides this class that might hamper our time to work on the project. We have until April 30, 2024 to complete development of Nutrilog: Smart Nutrition.

5.5.3. Cost and Delivery Date

The cost of development is the cost of our tuition for taking CSC-340, so the price of 3 credit hours at UNCG is the cost of development. $955.13 for in-state, and $2,923.37 for out-of-state tuition for 3 credit hours.

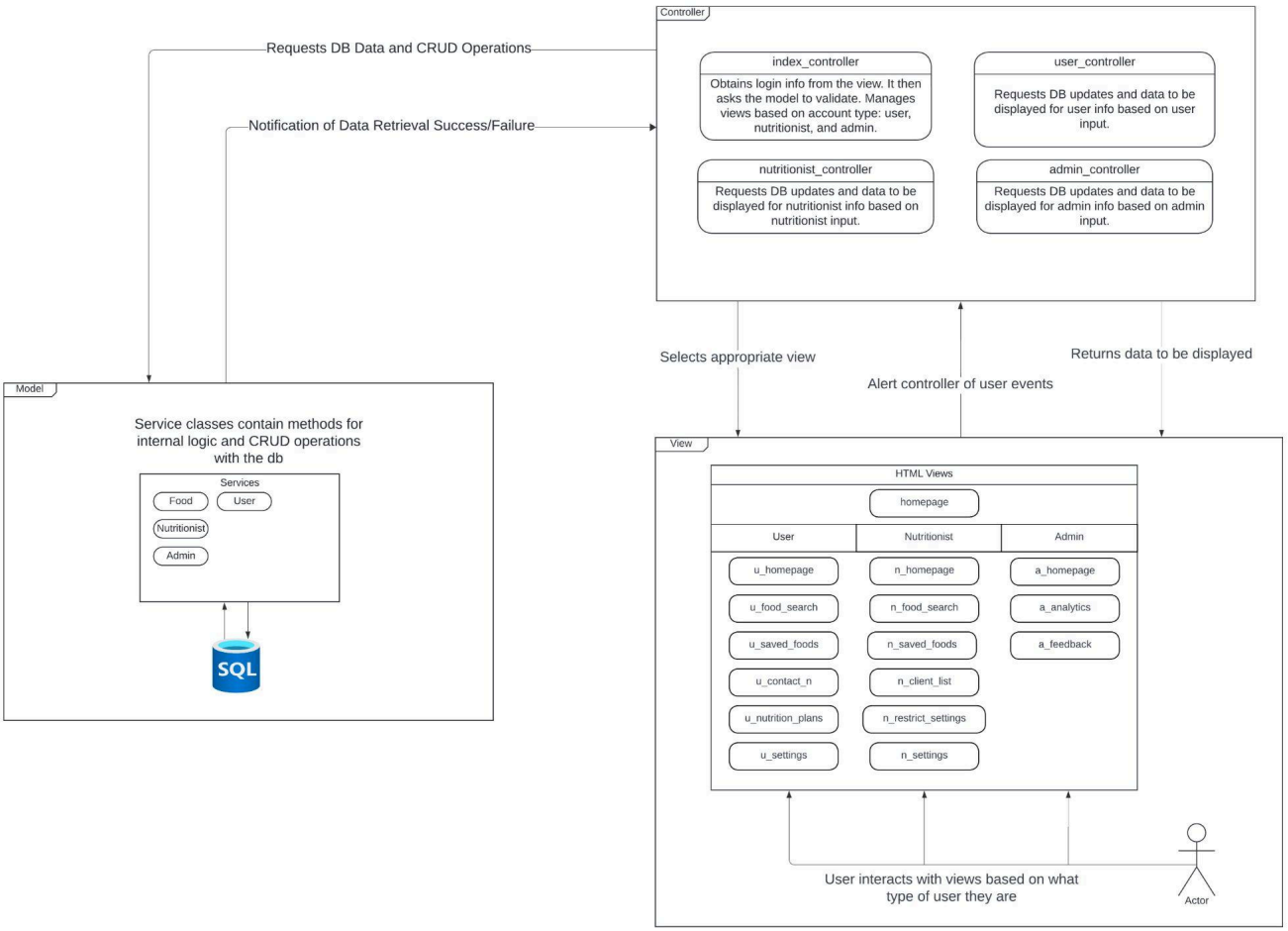
Delivery date is April 30, 2024.

5.6. Other Requirements

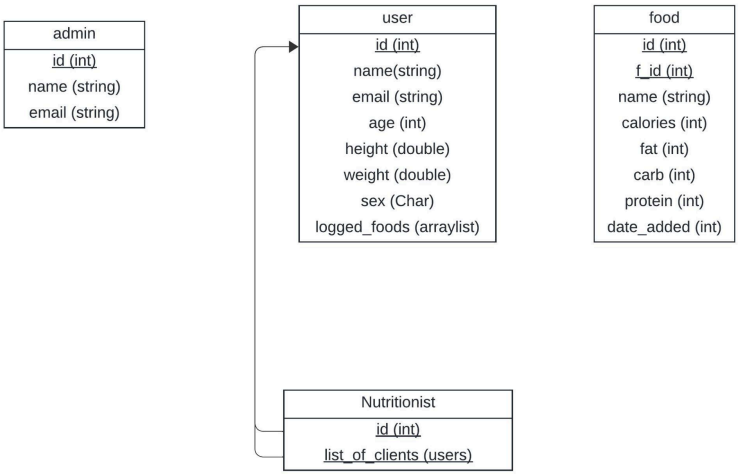
(Placeholder, it's too early to tell whether the system will have other requirements).

6. Design Documents

6.1. Software Architecture

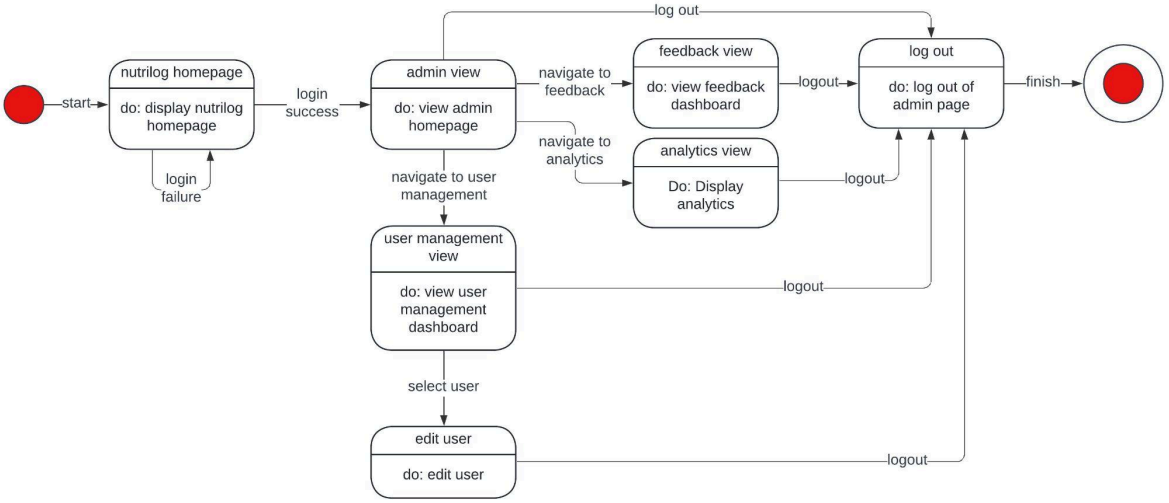


6.2. High-Level Database Schema

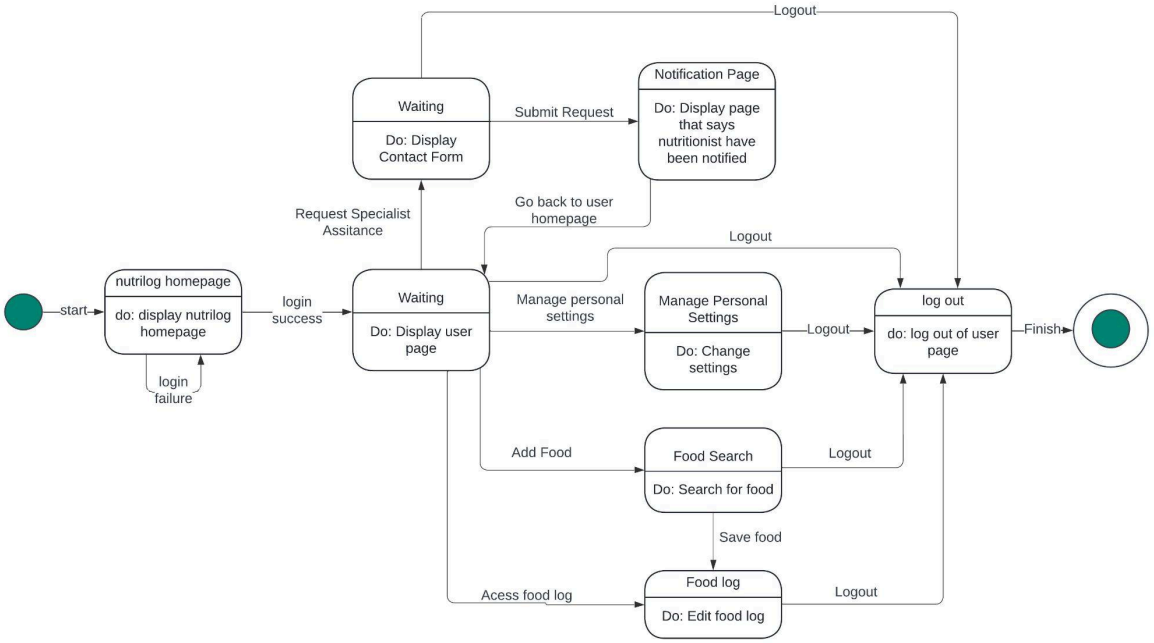


6.3. Software Design

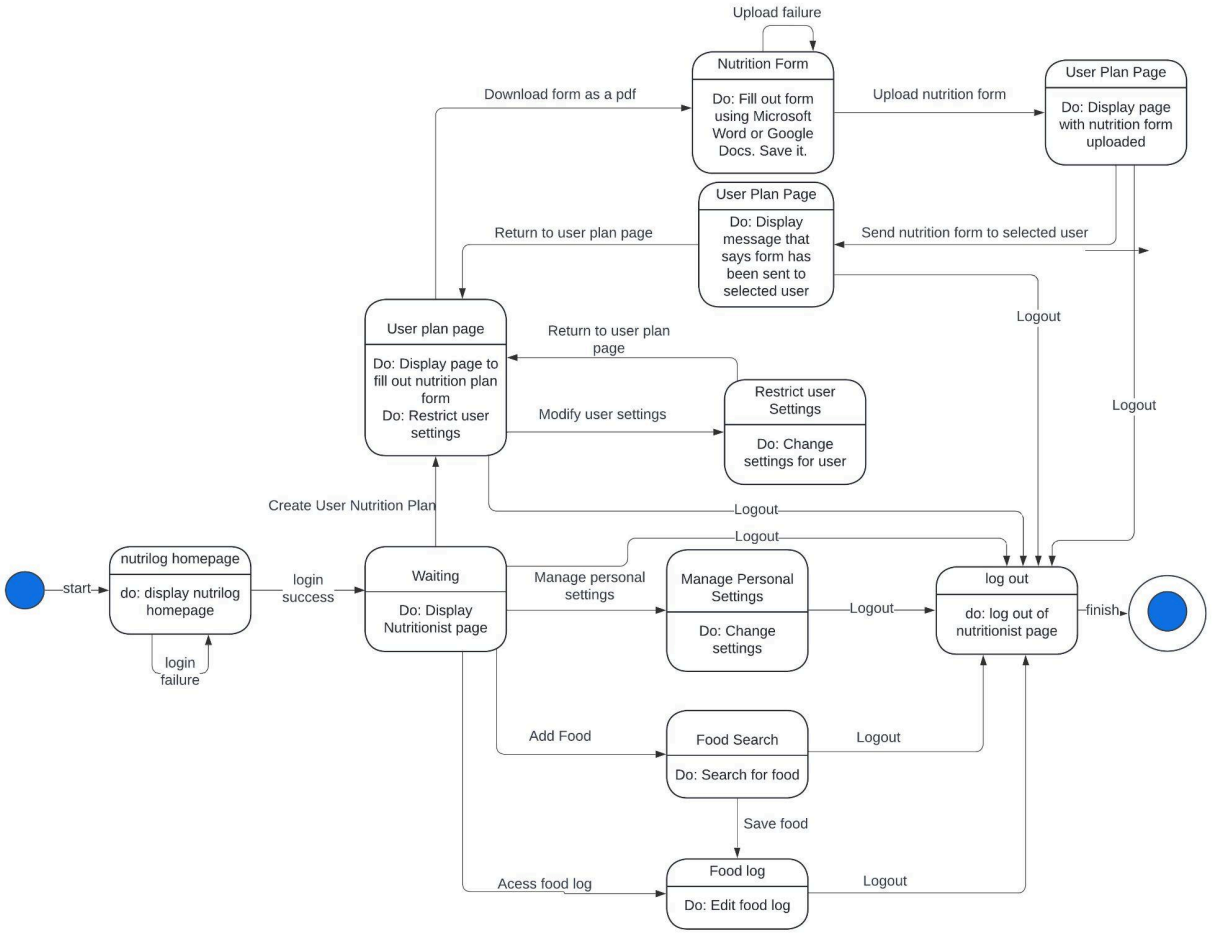
6.3.1. State Machine Diagram: Admin (Michael DeHaan)



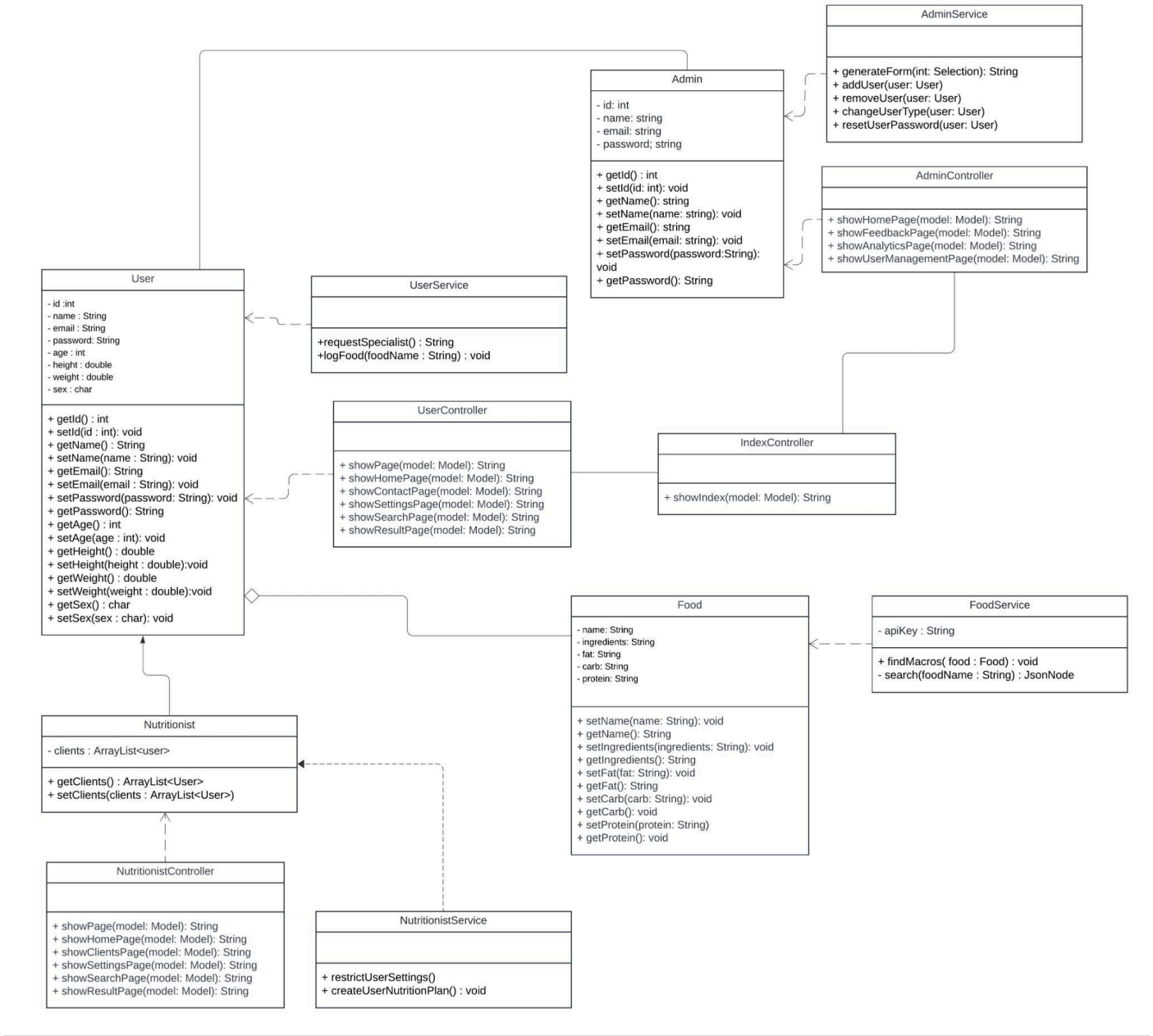
6.3.2. State Machine Diagram: User (Salvador Macias)



6.3.3. State Machine Diagram: Nutritionist (Carlos Villarreal)



6.4. UML Class Diagram



7. Scenario

7.1. Brief Written Scenario with Screenshots