NutriWeb: Abstract of the Technical Approach and Concept

1. Introduction

NutriWeb is a web-based application designed to help nutritionists and users manage nutrition plans and track dietary habits efficiently. The system provides nutritionists with tools to manage their clients, offer personalized feedback, and monitor progress, while users can log their food intake and receive tailored nutritional advice.

2. Concept

The concept of NutriWeb is based on providing a streamlined solution for both nutritionists and clients to manage dietary intake and nutrition plans. The platform supports two types of users: nutritionists and regular users. Nutritionists can access a dashboard to manage clients, review their dietary logs, and provide feedback. Clients, on the other hand, have a personal dashboard to log their daily food intake, track their calorie and nutrient consumption, and view feedback from nutritionists. The platform stores data using SQLite and a simple .db file managed in the back end, ensuring suitable and reliable management of the data.

3. Technical Approach

NutriWeb is built using a combination of PHP for backend logic, SQLite for database management, and HTML/CSS/JavaScript for the frontend. The backend is responsible for managing key functionalities such as user authentication, role-based access (whether the user is a nutritionist or a client), and interaction with the database. Nutrition-related data, including food logs and feedback, is stored in a relational database using SQLite. This database is lightweight and stored as a simple .db file, making it ideal for small to medium-scale applications. The system automatically creates the database on first use, but only if the required tables do not already exist. This feature ensures that the database remains intact during subsequent launches without the risk of overwriting existing data.
On the frontend, NutriWeb uses HTML/CSS to structure and style the interface, while Bootstrap is integrated to provide a responsive and consistent design across various devices. Bootstrap's grid system and pre-built components make it easy to create a professional-looking interface, ensuring that both nutritionists and clients can navigate the system smoothly.
Additionally, JavaScript is utilized for dynamic elements such as form validation, providing real-time feedback to users when they enter incorrect information. JavaScript also enhances the user experience by allowing for seamless interactions, such as updating the user interface without requiring a full page reload. This is particularly useful for updating the food logs and providing immediate feedback to users.
The system's automatic database initialization feature ensures that the necessary tables such as users, food entries, and feedback are created only if they do not already exist. If the tables are already present, the system bypasses the database creation process, thus maintaining the integrity of existing data. This approach simplifies the setup process for users and avoids potential errors from reinitializing the database unnecessarily.

4. Challenges and Solutions

One of the major challenges during development was ensuring that user roles were correctly managed. The system needed to differentiate between nutritionists and clients, each having access to different functionalities. This was addressed by implementing role-based redirects upon login and creating separate dashboards tailored to each role. For example, nutritionists can view client data and provide feedback, while clients can log their daily food intake and view personalized nutrition recommendations.

Another important aspect of the development process was learning how to manage communication between the frontend and backend. This involved using JavaScript and PHP to handle data operations such as fetching and storing user information. I had to learn how to use AJAX and fetch API to send data from the frontend (e.g., food log entries) to the backend, where it is processed and stored in the SQLite database. This approach ensured smooth and responsive interactions between the user interface and the server without requiring full page reloads. Mastering these data handling techniques was crucial in building a dynamic and user-friendly web application.

5. Limitations of the Project

While NutriWeb effectively demonstrates key functionalities like user registration, data logging, and role-based access, there are several limitations that would need to be addressed in a real-world scenario. The ability for users to register as nutritionists is not regulated, allowing unrestricted access to all user data. In a real application, professional credentials and privacy concerns would need to be properly managed. Additionally, the project uses a .db file generated by the init_db.php script. While functional for educational purposes, this approach would not meet the security and scalability requirements of a commercial system.

6. Lessons Learned

Developing NutriWeb provided valuable insights into both frontend and backend development. One of the key takeaways was the importance of planning the database structure early, as well as ensuring the user interface was intuitive for both nutritionists and clients. The project highlighted the importance of clean code and efficient query handling to manage data sets.

7. Conclusion

NutriWeb successfully fulfills its purpose as a learning project, allowing me to explore and implement various web development technologies. Through this project, I gained valuable experience in building a full-stack application, managing both frontend and backend components, and ensuring smooth communication between them. The process also helped me deepen my understanding of role-based access management, database design, and user interface development. While the project is not intended for real-world deployment, it has provided me with essential skills and insights that I can carry forward into future projects. The experience of working on NutriWeb has been instrumental in refining my approach to web development and problem-solving, making it a valuable part of my academic journey.