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Research Paper on Android Application for Diet Recall

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Abstract: ***In today's modern world people all around the globe are becoming more interested in their health and lifestyle. But just avoiding junk food and doing an exercise is not enough, we require a balanced diet. A balanced diet based on our height, weight and age can lead a healthy life. Combined with physical activity, your diet can help you to reach and maintain a healthy weight, reduce your risk of chronic diseases (like heart disease and cancer), and promote your overall health. A balanced diet is one that gives your body the nutrients it needs to function correctly.'***

Our aim is to make a system that helps users to make personalized diet plan and recall them for their meal time to time and help them to create a balance in overall calorie intake throughout the day. The system would remind the user on a daily basis to have their meal and with many options to choose from for a personalize meal plan for a day. Also, the user will be able to choose any type of healthy food they want as per their convenience out of the options that will be there to them by the system.

Our body use calories for basically everything like breathing, walking, running etc. On average a person needs 2000 calories per day but specifically intake of calories depends upon persons physical aspects like weight, height, age and gender. So, your food choices each day affect your health — how you feel today, tomorrow, and in the future. Thus, a proposed system gives required calories for a diet plan based on your physical aspects and your end goal.

Keywords: Machine Learning, Decision Tree Classifier, Random Forest Algorithm, Recommendation System, Diet Plan, BMI, Calorie

I. INTRODUCTION

A balanced diet is crucial to maintain one's physical health. However, nutrients that need to be ingested vary greatly depending on personal food preference and health conditions. Therefore, how to provide personalized food recall according to different personal requirements is very important. The past decade has witnessed the rapid growth of internet services and mobile devices. It has been more convenient for people to access huge amounts of online multimedia food content from various sources, such as forums, social media, recipe-sharing websites and customer review sites. Although this growth allows users to have more choices, it also brings problems for users to select preferred food items from thousands of candidates. Therefore, food recommendation is becoming increasingly essential for serving potentially huge service demand and can help users easily discover a small subset of food items which are enjoyable and suitable for them. Compared with recall in other fields, diet recall has its own characteristics. For example, diet preference learning is an important step towards diet plan creation. However, diet preference involves various factors, such as taste preference, perceptive difference, cognitive restraint, cultural familiarity and even genetic influence1 . Therefore, it makes accurate diet preference learning more difficult. Furthermore, diet recall should consider more context information.

II. OBJECTIVES

1) The objective of this study is to consider various important aspects of the user's lifestyle and make sure that these factors are incorporated while the system works on a solution to build and generate a healthy and nutritious diet for the user.
2) A good nutritious healthy diet and a moderate amount of physical activity can help in maintaining a healthy weight. But the benefits of good nutrition have a lot more to do than just managing the weight.
3) Being fit is all about the 70/30 rule. Here's how it goes, for a person to stay healthy he/she must focus 70% on his dietary intake and 30% on his physical activity/exercise.

III. PROBLEM STATEMENT

A diet recall is a method used to assess an individual's dietary intake by asking them to recall all of the diet and drink they consumed over a specific period, usually 24 hours or longer. The accuracy of diet recall can be affected by various factors, such as memory, social desirability bias, and incomplete or inaccurate reporting of portion sizes.

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The problem statement regarding diet recall can be to improve the accuracy and reliability of this method to provide better data for dietary assessments and interventions. This can be achieved by developing and implementing strategies to minimize the influence of the aforementioned factors, such as using visual aids to aid portion size estimation or training participants on accurate reporting techniques.

Additionally, incorporating other assessment methods such as diet diaries or biomarkers can provide complementary data to improve the accuracy of dietary assessments.

IV. LITERATURE REVIEW

Diet recall systems have been widely researched and developed in recent years due to their potential to improve user experience and increase sales for food-related businesses.

One study by Chen et al. (2020) proposed a personalized diet recall system based on user preferences and behavior. The system utilized a hybrid collaborative filtering and deep learning approach to generate recommendations, which were evaluated with user satisfaction and diversity measures.

Another study by Li et al. (2021) focused on developing a diet recall system using a combination of feature engineering and neural network models. The system incorporated user ratings, food attributes, and social network data to generate personalized recommendations.

Goh et al. (2019) proposed a food recall system for users with dietary restrictions, such as allergies or religious restrictions. The system used rule-based and collaborative filtering approaches to filter out prohibited foods and generate recommendations based on user preferences and restrictions.

In a study by Liu et al. (2018), a food recall system was developed for online meal ordering services. The system used a collaborative filtering approach with user ratings and item attributes to generate recommendations, which were evaluated based on user satisfaction and item popularity.

As nutritious diets are the important for maintaining a good health, it becomes necessary for everyone to intake a healthy diet. The paper devises a recommendation system that suggests a nutrition therapy as a key remedy for the diabetic patients who have diverse diet restrictions.

The author utilizes the clustering analysis method and the Self organizing method to formulate a FRS for the diabetes patients to provide perfect suggestion on their diet intake.

Jeong, et al [2] demonstrates the applicability of the recommendation system to the movie lens, the proposed methodology of the paper utilizes the “personal propensity and the secure collaborating filtering to deliver remedies to the sparsity and the scalability problems”.

Hao, et al [3] scopes in surveying the various social network analysis strategies to examine the social frame work and the significant properties using the network and the graph theories, utilizing the “soft computing strategies like the fuzzy logic the formal concept examination using the rough set theory and the soft set theory”.

V. PROPOSED METHODOLOGY

The main function of the proposed project is to provide users with a personalized diet plan based on their profile information, preferences, and health goals.

The app will use Knuth-Morris-Pratt (KMP) algorithm for searching food items for diet plan and uses metrics such as BMI, BMR, and activity level to calculate the recommended daily calorie intake.

In addition, the app will allow users to log their meals and track their progress towards their health goals. Users can input the foods they consume, and the app can calculate and display the nutritional information to help users monitor their calorie intake. The app will also provide users with health facts and interface to generate personalized diet plan to help them achieve their health and wellness goals.

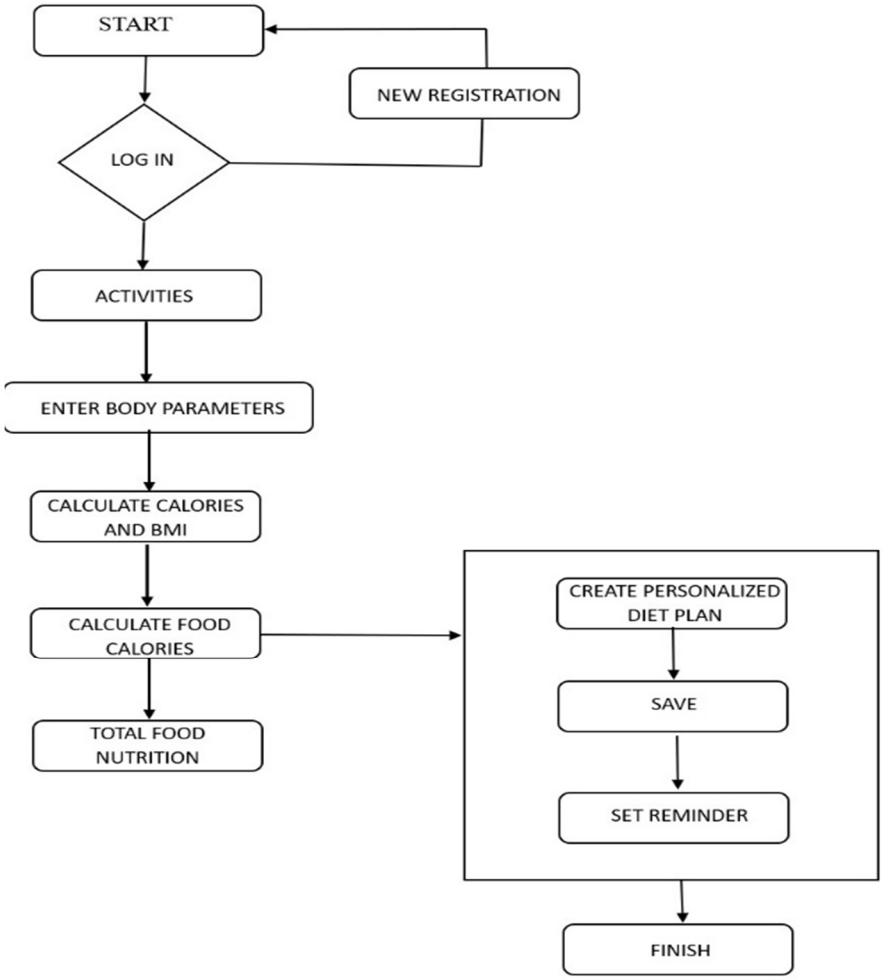
Furthermore, the app will set reminders for users to follow their personalized diet plan, helping them stay accountable and make adjustments to their diet plan as needed. This can improve the likelihood of users achieving their health and wellness goals.

Overall, the main functions of the project are to provide users with a personalized diet plan, enable users to log their meals and track their progress, provide health facts and set reminders to help users stay on track with their diet plan.

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VI. FLOWCHART



VII. IMPLEMENTATION

The app will have a registration page where users can create their account by providing their basic information such as name, email address, and password. The registration process can also include additional fields such as age, gender, and health goals to personalize the diet plans further. Once registered, users can log in to the app using their credentials for future access.

The app will use algorithms and metrics based on the user's profile information, preferences, and health goals to generate a personalized diet plan. This can include factors such as BMI (Body Mass Index), BMR (Basal Metabolic Rate), activity level, and nutritional requirements. The diet plan can consist of recommended daily calorie intake, macronutrient distribution (e.g., carbohydrates, proteins, fats) and generating meal plan according to user's preferences and restrictions.

The app can generate the personalize diet plan to the user and allow them to review and accept it. Which will allow the user to customize the plan based on their preferences.

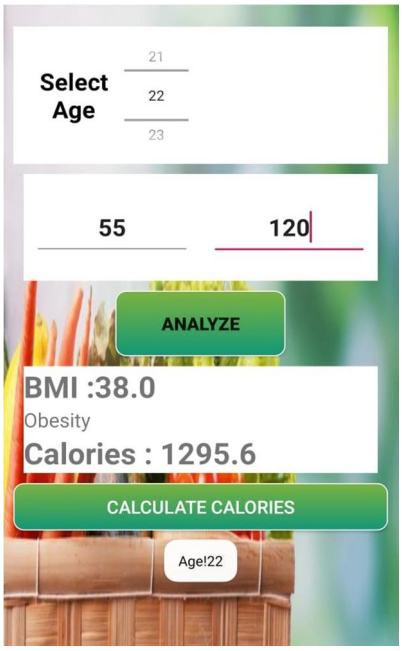
The app can allow users to log their meals and track their progress towards their health goals. Users can input the foods they consume, and the app can calculate and display the nutritional information to help users monitor their calorie intake, macronutrient distribution, and other relevant metrics. This can help users stay accountable and make adjustments to their diet plan as needed.

The app should prioritize the main problem statement i.e. “Diet Recall” which will remainder user to get their personalized diet plan on time throughout the day.

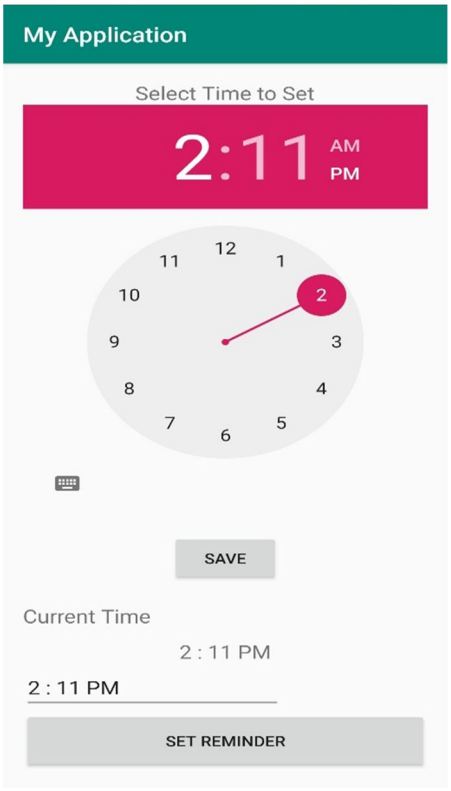
Overall, the proposed system with the added features of user registration, personalized diet plan generation, diet plan acceptance and alternatives, health facts, meal logging and tracking, workout plan integration, and data privacy can create a comprehensive and user-friendly Android app that empowers users to make informed decisions about their diet and achieve their health and wellness goals

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VIII. RESULTS



Screenshot 1: Health Results



Screenshot 2: Set Reminder

To recommend a suitable diet based on this information, you can calculate the appropriate daily caloric intake and then create a meal plan with a balance of macronutrients (carbohydrates, proteins, and fats) that meets the individual's needs and preferences. It's also important to consider any dietary restrictions or health conditions that may affect their diet. Consulting a registered dietitian or a qualified nutritionist is recommended for personalized diet recommendations.

IX. CONCLUSION

With the proposed application on mobile phones, we will be able to bring the Dietitian App on the palm of every individual. The application can be deployed on the cloud by integrating different servers through the cloud in its future iterations.

With respect to the feedback of the App users' further improvements can be incorporated within the system to make it more users friendly. In our approach for implementing this project is we have implemented a virtual dietitian using android. Our system comprises of main components such as of a user login and an admin login. The software system allows the user to create their profiles and upload all their details and their BMI is calculated by the system. The admin can check each user details and can remove faulty accounts.

People who are in need of a serious health care but are busy with their schedules, can start using our application and start following their diet plan. User doesn't have to go to an actual dietitian he can have a dietitian in the palm of his hands which will remind you for your every meal.

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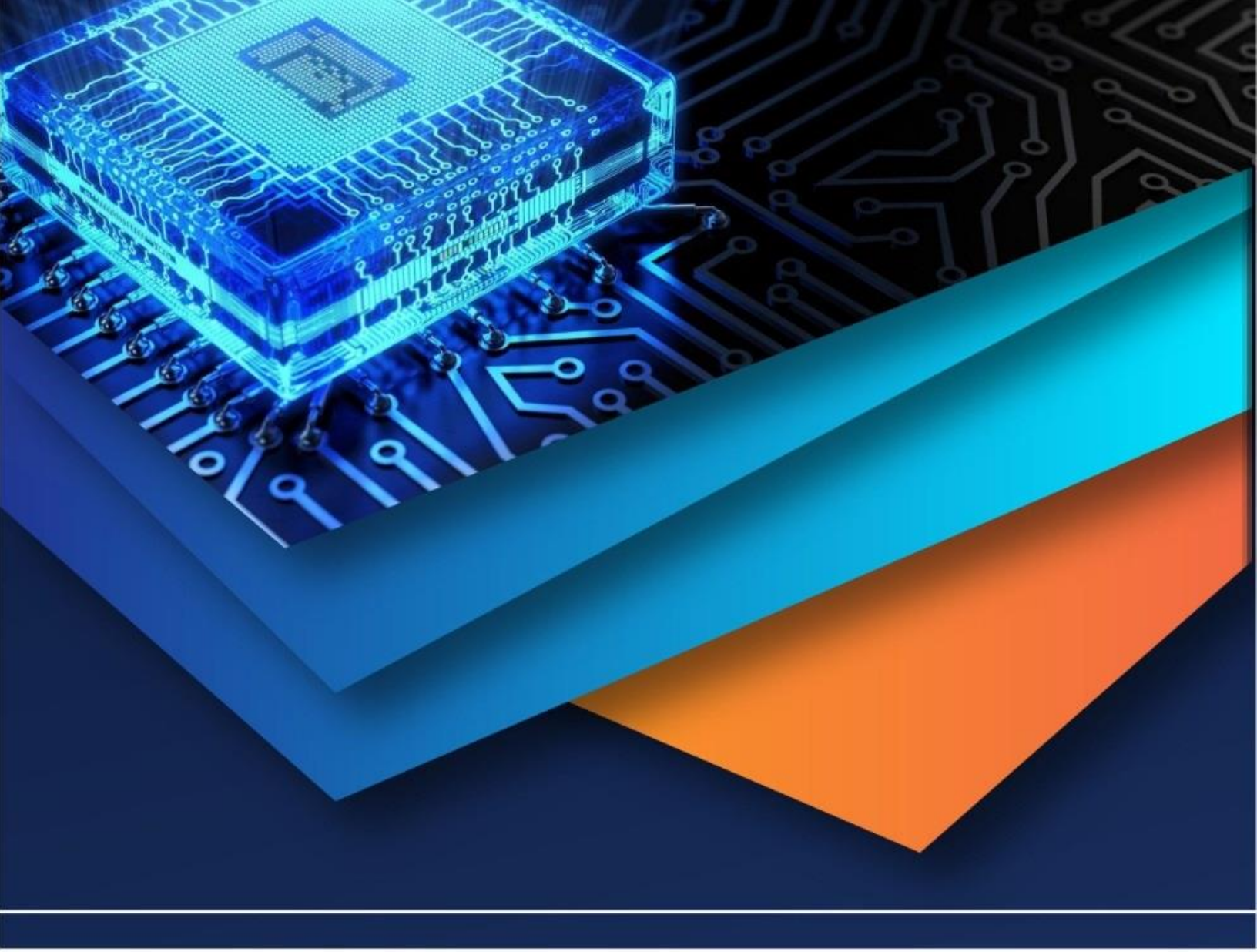
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