PERSONAL NUTRITIONIST RECOMMENDATION USING ENSEMBLE MACHINE LEARNING TECHNIQUES

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Abstract- **People make decisions related to food every day. They all think about what to eat, where to eat, how much nutritional value this food has, can this make me lose weight, can this food make me healthy and other questions. Recommendation systems help the user to make fast decisions in these complex information spaces. These systems include informative content and services, which persuade users to alter their behavior. This recommender could exploit the nutritional values of the food to inform its recommendations**

Keywords: K- Nearest Neighbor, Internet of medical things, Random Forest, Decision Tree

1.INTRODUCTION:

Inadequate and inappropriate intake of food is known to cause various health issues and diseases. Due to lack of concise information about healthy diet, people have to rely on medicines instead of taking preventive measures in food intake. Due to diversity in food components and large number of dietary sources, it is challenging to perform real-time selection of diet patterns that must fulfill one's nutrition needs. Particularly, selection of proper diet is critical for patients suffering from various diseases. Recommender system has been widely used in recent days, in the field of food recommendation. Much of the attention in the diet and nutrition is being paid to diet management systems, which have been replacing traditional paper-and-pen methods. These systems include informative content and services, which persuade users to alter their behavior. Due to the popularity of these diet monitoring facilities, these system should a vast amount of user preference information, which could be harnessed to personalize interactive features and to increase engagement with the system and the diet program. This recommender could exploit the nutritional values of the food to inform its recommendations. The goal of the application is to provide a platform where users find their favorite food and its nutritional value.

2.LITERATURE REVIEW:

In (l), A DASH Diet Recommendation System for Hypertensive Patients Using Machine Learning. The system makes use of a mobile application which is handy and quick to use. Can recommend only a few dishes.
In (2), e-Health Monitoring System with Diet and Fitness Recommendation using Machine Learning.
Patient Diet Recommendation System Through Machine Learning Model. High accuracy, low costs Small Dataset is used. In (3), Website on Diet Recommendation Using Machine Learning:_Multi-modal Approach for better accuracy.The prototype built shows less precision and work inefficientlyIn In (4), Predictions of Diabetes and Diet Recommendation System for Diabetic Patients using Machine Learning Techniques. High accuracy High processing time. In (5), Nutritional biomarkers and machine learning for personalized nutrition applications and health optimization. Important biomarkers related to metabolism are considered Inaccurate and inefficient. In (6), A Health-Awareness Nutrition Recommender System. The proposal incorporates a decision analysis approach based on multiple criteria to screen inappropriate foods Low accuracy, high cost. In (7), A Food Recommender System Considering Nutritional Information and User Preferences. It leverages an the optimization-based stage for generating a daily meal plan User preferences are not healthy so it may be inaccurate. Finally in (8), A recommender system for adaptive diet monitoring and personalized food suggestion. The proposed system is able to build a user's health profile, and provides individualized nutritional recommendation according the health profile Not Costeffective, Takes much time

3.EXISTING SYSTEM

The existing system is based on content based recommendation systems. Content based food recommender system is where recommend food recipes according to the preferences already given by the user. The preferred recipes of the user are fragmented into ingredients which are assigned ratings according to the stored users' preferences. The recipes with the matching ingredient are recommended. The traditional models do not consider the nutrition factors and the balance in the diet. Nutrition factors are ignored which are very much important to recommend food and balance diet. Only foods containing milk or fish can be searched. Only displays the nutritional value of the food. Does not contain a wide variety of food but only the popular ones. For the existing system of personalized diet recommendation system, a small dataset is taken and only one or two features such as weight loss is taken into consideration. The system shows low accuracy and high processing time.

4.PROPOSED SYSTEM

This project aims to present the development of an expert system prototype on nutrition and diet domain. The objective of this developed nutrition and diet expert system is to help people to evaluate their nutrition condition and to know their neediness of the type of food and required time to do exercising each day. Moreover, the system provides advices about healthy food and the rate of protein, vitamins, and calcium they have to eat. Accordingly the developed system improves people awareness about the importance of nutrition, reduces consultation time and makes people care more about their health. This developed prototype nutrition expert system provides advice only for healthy people , not for unhealthy people and pregnant and lactating women. The major advantage of the proposed system for personalized nutritionist based system is that it is highly accurate, and precise. For the proposed system, large vast dataset is taken. Features like weight gain are added in proposed system with improved accuracy. The system can be used in situations where large amounts of data have to be processed in a short amount of time. It is cost-efficient.

5.PROPOSED ALGORITHM

5.1 Data Collection

The 1st modules majorly deals with gathering the users the personal information such as height, weight, food habits etc. which is then stored into a data set. Once that's done the data set is launched and the basic functions / methodologies are derived from it. After selection of data, data cleaning operations are performed on datasets to remove noise from dataset and normalize the features. The reason for doing this is that dataset has different scale values some are single digit values, some features has two digest values and some features has threedigit values so we bring all the values in to single scale to make the performance of our model better.

5.2Model Building

The 2nd modules comprises of 3 major functions:

1. Weight loss
2. Weight gain
3. Graphical interface

Under the 1st function we gather more information about the user based on which we write codes of the weight loss. Things like BMI, calories to be lost etc are calculated here. Based on these calculations the food recommendations are shown to the user. Under the 2nd function which similar to the 1st function, we access the data and calculate the BMI, calories etc and according the users requirements we show a list of food that can be consumed for weight gain. The 3rd function is a common feature that shows all the healthy food options and each food along with its calorie count is shown her

5.3Input,

processing and predicting output inputs such as age, weight, food Preference is taken.3 options are given to the user: weight gain, weight loss and healthy food. Based on the users choice the graphical depiction is shown along with the food recommendation that works for them. It provides people with ranked food items using rich context and knowledge, personal model constructed dynamically.

CONCLUSION

Food recommender systems have received increasing attention due to their relevance for healthy living. The proposed framework is a food recommendation approach focused on generating daily personalized meal plans for the users, according to their nutritional necessities and previous food preferences. It would provide functionalities to keep track of nutritional consumption as well as to persuade users to change their eating behavior in positive ways. Furthermore, our personal nutritionist system not only recommends food suiting users' preferences, but also suggests healthy food choices, keeps track of eating behavior, understands health problems, and persuades to change user behavior. In this context, we also discussed scenarios for applying group recommender systems in the healthy food domain. Future work would include the introduction of a smart technology that would enable the system to give a proper explanation behind their suggestion.

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