Vitamin Deficiency And Food Recommendation System Using Machine Learning

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ABSTRACT:

People are not paying attention to the quality of food they eat in our fast-paced and hectic world. They frequently ignore their eating routines and behaviours. Fast-food consumption is frighteningly increasing, which has resulted in the consumption of harmful foods. This causes a variety of health problems, including obesity, diabetes, and an increase in blood pressure, and so forth. As a result, it has become critical for people to have a well-balanced nutritionally sound diet. There are several applications that are thriving to assist folks in gaining control of their food and therefore can help individuals lose weight or maintain their fitness and health. The study article proposes healthy eating habits and patterns so that anybody may know the number of calories expended, macronutrient intake, and so on using data mining technologies. This technology is designed to uncover hidden patterns and client eating habits from various data sources. This approach will aid in tracking and improving an individual\'s health as well as the types of food that they should avoid in order to reduce their chance of disease. A balanced diet is one in which the intake of each basic nutrient meets its sufficient demand and real caloric intake equals calories burnt. Additionally, making a variety of dietary choices is vital for lowering the chance of acquiring chronic illnesses. This diet recommendation system tailors its recommendations to each individual depending on their eating patterns and body data. This study aids in the prediction of a healthy diet for any individual, as well as the construction of a diet plan based on the needs of the patient.

Keywords: Vitamin, Food, fast food, dietary, body data.

1. INTRODUCTION:

Nowadays, a human being is suffering from various health problems such as fitness problem, inappropriate diet, mental problems etc. Various studies depict that inappropriate and inadequate intake of diet is the major reasons of various health issues and diseases. A study by WHO reports that inadequate and imbalanced intake of food causes around 9% of heart attack deaths, about 11% of ischemic heart disease deaths, and 14% of gastrointestinal cancer deaths worldwide. Moreover, around 0.25 billion children are suffering from Vitamin-A deficiency,

0.2 billion people are suffering from iron deficiency (anaemia), and 0.7 billion people are suffering from iodine deficiency. The main objective of this work to recommend a diet to different individual. The recommender system deals with a large volume of information present by filtering the most important information based on the data provided by a user and other factors that take care of the user's preference and interest. It finds out the match between user and item and imputes the similarities between users and items for recommendation based on their physical aspects (age, gender, height, weight, body fat percentage), preference (weight loss or weight gain). The recommendation process has basically three stages that are Information Collection Phase, Learning Phase and Recommendation Phase. The information is firstly collected about a particular problem and the various solutions related to that problem are categorized. After the collection of information Learning Phase comes in which various conclusions are made out of that information which is gathered and in last phase i.e., Recommendation Phase an output is given in which various recommendations are made. In our project the output of recommendation is based on user's physical aspects, preference and their Body mass Index (BMI).

Balanced nutrition is important aspect of healthy lifestyle for peoples. Along with balanced diet, a regular physical exercise is crucial for healthy life. Now a day's nutrition and health are often overlooked. The majority people suffering with diabetes, heart disease, cancer, stroke etc. The diseases are almost directly related to unhealthy eating habits. So, our body needs nutrients to stay healthy, and food supplies essential nutrients that stop us from getting sick. A healthy, balanced diet will usually include vitamins, minerals, protein, healthy fats, proteins, carbohydrates.

2. LITERATURE SURVEY

Racial era Toledo proposed a food recommender system considering nutritional information and user preferences. The meal plan for the user recommended using users' preferences. This tool manages both user preferences and nutritional information. Vijay Jaiswal proposing a healthy food habit, eating patterns and calories burned count can be intake of nutrients and so on using the data mining tools. In this tool the hidden patterns and customer food taking habits are found from different data sources. In this tool decision tree learning algorithm, Random Tree algorithms are used on different datasets. H. Jiang proposed a system to calculate the daily calorie demand. The Knapsack algorithm is used for recommended diet combinations of users. Different from other diabetic diet recommendation systems, this system can rank the recommended diet combinations using TOPSIS algorithm according to user's food nutrition. Jung-Hyun Lee proposed a customized diet recommendation service managing heart diseases. This service provides customers customised general information,

family history of diseases, seasonal food intakes. Rung-Ching Chen constructs a recipe ontology that defines some common diseases healing with verity of food recommendations and an inference engine for customer health condition and a recipe ontology can be used for proper recipe recommendations on food priorities. Fidelson-Tanzil uses ABC algorithm to extract information from database according to user's requirements. Kmean and SOM algorithms are used on datasets. Muhd Afifi projected ABC algorithm in Data Mining and tested compared to six traditional classification algorithms successfully and ABC proved as a suitable algorithm for recommendation. Xia yan Gao proposed the food recommendation problem on user choice recipe recommendation factors. By using a neural network-based solution on Ordered diet Recommendation.

The authors INGMAR WEBER and PALAKORN ACHANANUPARP [1] made an attempt to gain insights from machine leaned - diet success prediction which would help people trying to stay fit and healthy by keeping a track on their dietary intake. The authors used public food diaries of more than 4,000 long-term active MyFitnessPal users to study the characteristics of an unsuccessful diet. Concretely, authors trained a machine learning model to predict repeatedly being over or under self-set daily calorie goals and then look at which features contribute to the model's prediction, where research was cantered around "quantified self " data.

EXISTING SYSTEM

Content based food recommender system is proposed which 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 authors do not consider the nutrition factors and the balance in the diet. Moreover, chances of identical recommendation are also present because the preference of the user may not change on daily basis. Tags and latent factor are used for android based food recommender system [2]. The system recommends personalized recipe to the user based on tags and ratings provided in user preferences. The proposed system used latent feature vectors and matrix factorization in their algorithm. Prediction accuracy is achieved by use of tags which closely match the recommendations with users' preferences. However, the authors do not consider the nutrition in order to balance the diet of the user according to his needs.

PROPOSED SYSTEM:

The System works in a Machine Learning Environment, we use multiple machine learning algorithms to check accuracy of vitamin deficiency and food recommendation and best model is used for prediction in flask web application. When user enters vitamin values algorithm will predict deficiency is vitamin and recommend food.

3. METHODOLOGY

Decision tree learning is a data mining decision assistance tool that employs a tree-like model for decision making and computing the goal value with a separate function. It employs a branching strategy to present every conceivable choice

outcome. The learnt function is represented by the decision tree. It is a straightforward format for categorizing examples. The decision tree is a popular non-parametric effective machine learning approach for creating tree-like classification or regression models. The decision tree learning algorithms are commonly utilized for the following three reasons: 1) The decision tree may be widely utilized to derive conclusions from unseen examples of specific scenarios. 2) In these approaches, efficient computations that are proportionate to the observed occurrences are done. 3) Finally, when all computations have been completed, the created decision tree is easily comprehended by humans. The suggested system uses the RandomTree algorithm for decision tree learning to make judgments such as which appropriate food item should be assigned while preparing the menu. The training dataset is supplied to categorize the decision tree in order to make this judgement. Entropy and information gain factors are calculated using training data. A condition might result in both negative and good results. The suggested system employs a decision tree to assess if a specific food item should be offered to an individual or not, considering parameters such as the Category of user fitness objectives, the Likeness Factor, and whether or not the individual is allergic to food products. Based on the favorable or bad consequence, one may efficiently recommend meals to be given to an individual. To make appropriate choices among accessible meals, the RandomTree algorithm is employed. When creating an appropriate healthy diet plan, user preferences might be considered. A larger training set produces more accurate results. As the number of potential examples in characteristics grows, so does the training set. In this situation, the training

data set is interpreted as all of the possible cases for each user, ensuring that accurate results are generated each time. To train RandomTree, a suitable collection of characteristics and an output choice must be given.
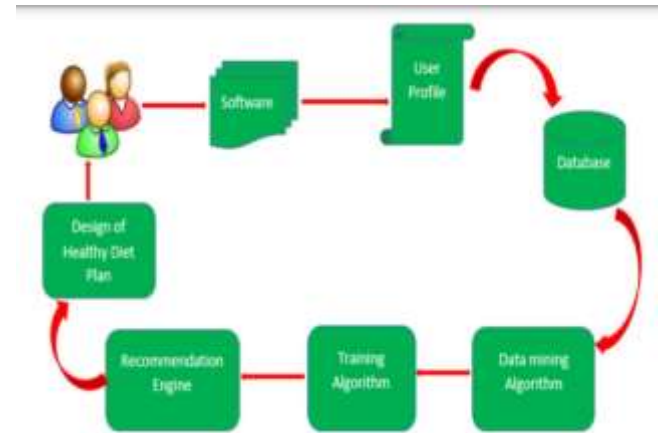
The RandomTree method is used to determine whether a specific food item should be supplied to an individual or not. To utilize RandomTree, you must first train it using the training dataset presented in Table 1. The decision tree is constructed after using the RandomTree method on the training data, as illustrated in Figure 8. The decision tree indicates whether or not a certain food item should be included in the client's diet plan. If a person is allergic to a food item listed in the system, the food is immediately deleted from his diet plan; otherwise, the system evaluates the liking factor of clients towards that food item. If a customer has a high liking factor for a certain food item, that meal will be included in his diet plan regardless of his fitness objective. If the likeness factor for a food item displayed is medium, the decision on whether that food item should be included in the diet plan or not will be made by taking the client's fitness goals into account; otherwise, if the likeness factor is low, the food item will not be added to the client's

healthy diet plan. After using the classification approach to identify which food products are acceptable for an individual, the specified criteria are applied to the algorithm, and a healthy diet plan based on an individual's preferences is developed. In the future, an algorithm can be built to recommend a meal plan based on advanced nutrition levels such as salt content, phosphorous content, fibre content, manganese content, and so on. Along with the food products recommended for each meal, the system may be programmed to develop and deliver recipes that contain all of the food items recommended in the meal plan.

CONCLUSION

The relevance of dietary counselling in leading a healthy and fit life is growing by the day. A healthy diet plan may be developed by accepting the user's food choices and a user's profile in the system. Balancing the diet and developing a healthy diet plan by measuring calorie requirements based on an individual's preferences is often a time-consuming and labor-intensive procedure. The research and their implementation shown that the decision tree learning method, RandomTree, performs effectively on any classification issue with non-repeated values in the dataset.

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