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# Survey on Diet Recommendation through Machine Learning

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**ABSTRACT:** We aim to utilize the recent advancement in technology to develop dietary assessment solutions which is a more convenient approach to monitor daily food intake and control eating habits. Food, calorie and nutrition measurement system is very beneficial for people to measure and manage their daily food intake. Machine Learning will make recommendations based on the items that are of user's interest or liked by them in the past. Also these algorithms are used to recommend the food that the user may like. The recommended food and food in standard recipes set by user's own situation are in the same cluster, which meets the user's nutritional balance. We highlight the issue of selection of proper diet that must fulfill everyone's nutritional requirements.

**KEYWORDS:** Diet Recommendation, Machine Learning.

## I. INTRODUCTION

In today's hectic world, the importance of diet management has increased drastically. Due to unhealthy and haphazard eating habits, the spread of diet related diseases is at an all-time high. In India, more than 2 out of every 100 people suffer from diabetes, while 32 out of every 100 people suffer from coronary heart disease. There are a host of diet related applications and solutions available today. While the importance of balanced diet keeps on increasing, the variety of applications on display today still lack completeness. This application will help users structure their daily diet according to various individual factors which include BMI, allergies, diseases, etc

### 1.1 Motivation

Today, wide changes have occurred in life of all people. Malnutrition, Unhealthy diet, smoking, alcohol consumption, drug abuse, stress and so on, are the presentations of unhealthy life style that they are used as dominant form of lifestyle. Every day, citizens face with new challenges. For instance, emerging new technologies within IT such as the internet and virtual communication networks, lead our world. Hence, due to this unhealthy and hectic lifestyle people are unable to dedicate more time to improve their health and eating habits. This reason provided a motivation of us to create a system that will guide the users and provide them with a diet plan at the comfort of their home.

### 1.2 Need

Balanced nutrition is an important aspect of a healthy lifestyle. Along with regular physical exercise, a balanced diet is extremely crucial for a person's health. However, with the ever-increasing pace of today's professions, nutrition and health is often overlooked. Seasonal availability in India is a major issue and this application aims to provide accurate information about the same. Pre-existing conditions of the user will be taken into consideration and the application will only provide relevant information according to the condition. Our project will also consider the dietary requirements of users and the users can create profiles to keep track of their diet.

## II. LITERATURE SURVEY

Anonnya Banerjee et al. [1] stated that, to provide a better dietary solution our paper proposes a model to basis of their potassium level in blood. Classification of the patients is implemented recommend food for patients suffering from kidney disease on the using WEKA and then further using query-based matching we recommended food for the identified levels based on the seriousness of the disease.

Akash Maurya, Rahul Wable [2] proposed that proposed m extracts the features which are responsible for CKD, then machine learning process can automate the classification of the chronic kidney disease in different stages according to its severity. The objective is to use machine learning algorithm and suggest suitable diet plan for CKD patient using classification algorithm on medical test records. Diet recommendation for patient will be given according to potassium zone which is calculated using blood potassium level to slow down the progression of CKD.



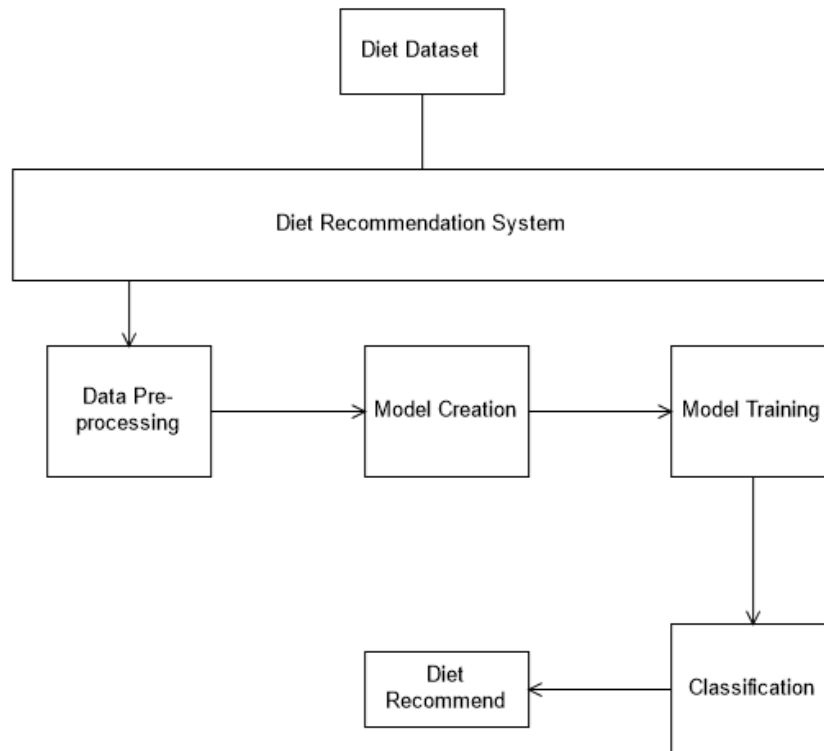
Heba Abdelgader Mohammed [3] proposed that work in progress to develop a type 2 fuzzy logic based diet recommendation system for diabetes to help achieving a healthy lifestyle to control the disease.

Celestine Iwendi et al. [4] stated that in this paper, deep learning solution for health base medical dataset that automatically detects which food should be given to which patient base on the disease and other features like age, gender, weight, calories, protein, fat, sodium, fiber, cholesterol. This research framework is focused on implementing both machine and deep learning algorithms like, logistic regression, naivebayes, Recurrent Neural Network(RNN), Multilayer Perceptron(MLP),Gated Recurrent Units (GRU), and Long Short-Term Memory (LSTM).

### III PROPOSED METHOD AND ALGORITHM

- **Proposed Methodology:**

People login into the system and directly enter their health-related information and working lifestyle which is directly stored into the database. This health and lifestyle related information acquired through the software is the first-hand material for this system e.g. the height, weight, diseases etc. The data regarding food items and its nutritional value is collected from the dataset provided by USDA agricultural research service food datasets. Generally, the data acquisition module selectively obtains data from the outside web environment, in terms of functionality to provide material and resources for the latter algorithms.



**Fig1. Proposed Architecture**

### B. Algorithms

#### 1. Linear Regression

Once we've acquired data with multiple variables, one very important question is how the variables are related. For example, we could ask for the relationship between people's weights and heights, or study time and test scores. Regression is a set of techniques for estimating relationships, and we'll focus on them in our system. In this paper, we'll focus on finding one of the simplest types of relationship: linear. This process is unsurprisingly called linear regression, and it has many applications.

#### 2. Support Vector machine

Generally the use of machine learning algorithm is used for the recommendation. In this paper, the support vector machine will suggest the diet. SVM is a supervised machine learning algorithm which works based on the concept of decision planes that defines decision boundaries. A decision boundary separates the objects of one class from the object



of another class. Support vectors are the data points which are nearest to the hyper-plane. Kernel function is used to separate non-linear data by transforming input to a higher dimensional space. Gaussian radial basis function kernel is used in our proposed method.

#### IV. CONCLUSION

We provide a user-friendly application that covers aspects like diseases and menu generation along with providing nutritional information. The output will be in the form of Suggested Nutrient Intake Raw Materials, as well as the Menu Generated.

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