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Automated Diet Planner

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***Abstract*: The majority of people are cautious about what they eat every day. There are now systems available to assist people in controlling their eating habits. In any case, the systems aren't focused on the client's specific requirements. Different people will require different dietary requirements or nutrients for their bodies. We have developed a Diet Planning System. The project is about a new web application that combines the functions of a personal wellbeing assistant and a diet planner. This web-based application system will assist users in obtaining data on their nutritional intake. Dietary suggestions will be made for the user depending on diseases and how many calories they require on a daily basis.**

***Keywords*: BMI, daily required calories, diseases, generate diet plan, ml, and random forest classifier.**

1. Introduction

Obesity and chronic diseases are significant health concerns in modern countries, imposing a strain on individuals, patients, and national health-care systems. Different people will have different dietary needs due to differences in age, weight, height, gender, and lifestyle. Males require different types of food than females, and persons who engage in sedentary exercise require different types of food than those who engage in vigorous activity, and so on. A well-balanced diet can assist you in achieving this goal. We need to eat a variety of foods because different meals provide different nutrients in varying amounts. Self-monitoring may be the most effective method for improving one's health. Unfortunately, present diet control and advising methods and procedures are insufficient and have various faults. We have designed a web-based application that is an automated diet planner system. It gives the user a detailed diet plan based on his or her daily calorie requirements, as well as his or her activity level (whether active or sedentary). It also considers whether the user is suffering from any diseases. Different diet plans will be prepared based on the gender, age, height, and weight provided by the user. It also allows the user to calculate his BMI and the number of calories he needs to consume each day.

1) Problem definition

To develop an Online Diet Planning System through web based application using Machine Learning. It will assist users in improving their healthy diet planning without having to spend a lot of money or effort. The system will allow busy users to use it since it will be designed to provide information fast and effectively.

2. Methodology Used

The methodologies we have used to develop the user interface of the project are:-

i. *Bootstrap*: It is the open source toolkit for building responsive front end user interface with HTML, CSS and JavaScript. Bootstrap is the world's most popular front end component library.
ii. *HTML5*: This is the latest version of Hyper Text Markup Language (HTML) with new elements, new attributes and behaviors, and a large set of technologies which allows the building of more diverse and powerful websites and applications.
iii. *CSS3:* This is the latest standard of Cascading Style Sheets (CSS) which is basically used for styling the web pages to make it look attractive. The CSS3 includes more features like rounded corners, text shadows, background gradients, opacity.
iv. *JavaScript:* It is a programming language of HTML and web. It is a prototype based, dynamic language and it supports object oriented styles and imperative styles.
v. *Django Framework*: Django is a Python web framework for building secure and maintainable websites quickly. To integrate model, view, and template, we built our website using the Django framework.
vi. *Pandas:* Pandas is a library in python which is used for data processing.
vii. *Sklearn:* Scikit-learn is a machine learning library which we used for training our model.

3. Background

The main drawback of the existing systems is generating a diet plan based on the user's height and weight without taking into account the user's daily routine, health problems, or the sorts of food they can eat, which is a significant issue. Unfortunately, present diet control and advising methods and procedures are insufficient and have various faults. To begin with, most existing systems concentrate their efforts on tracking food consumption or storing food nutrition data, but they rarely

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immediately give the user an appropriate diet plan or advice. Existing nutrient-based recommendations, even with the diet advice, are only intended to serve as generic guidelines and are not personalized to individuals. There is no easy way for the user and the diet planning system to communicate. Users can only accept or reject the diet planning results provided by the existing system; they do not have the ability to fine-tune the suggested meal content or provide feedback to the system [1].

4. Literature Survey

Apps / Websites	Home Work out	Count Calories	Profile features	Weight Loss	Muscle Gain	Food Categories	Paid
MyDietMeal Plan (No Assistant)	No	We can see calories in food plan and also keep track of our progress.	Name, Email, Height, Weight, Allergy, Food Preference.	Meal plan for weight loss is provided and we can keep track of our progress.	Meal plan for weight gain is provided and we can keep track of our progress.	Vegetarian, Paleo, Vegan, Pescetarian	Yes
TheFitIndian (No Assistant)	Workout plan is provided	We can enter amount of calories.	Name, Email, mobile number, I want to (Lose weight/Maintain/Build Muscle), Height, Weight, Age, Body fat, Activity Level, Weight goal, BMI.	Meal plan for weight loss is provided and we can keep track of our progress.	Meal plan for weight gain is provided and we can keep track of our progress	Vegetarian, Non-Vegetarian	Yes

Fig. 1. Comparison of both systems

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Fig. 2. Comparison of both systems

5. Detailed System Description

We proposed a smart system here which is web based that would generate a diet plan for the user on the basis of the details entered by him/her. The details include fields like age, height, gender, activity level and whether the user has any diseases related to diabetes, heart or kidney. So the user has to register himself/herself for the same. If the user is already registered then he/she can directly sign in. The data entered by the user is given to the prediction model which will predict the desired plan for the user. The prediction model is trained by using the Random Forest Classifier. The dataset which was taken from Kaggle is read using pandas library as it was in .csv form. The dataset is then divided into two subsets viz. training and testing data using train_test_split method from sk learn. model_selection. The training data is then used to create a model for prediction. The model is tested for accuracy against testing data by using accuracy score method from sk learn. metrics. Once the model is trained successfully the input data is passed into the model so as to generate a diet plan for the user. Also our system will provide the user with his/her BMI upon entering the details for the same. The details required for calculating BMI are users height and weight. Upon entering the details, BMI gets displayed on the screen along with the type of weight the user comes under like whether he/she is underweight, overweight, normal weight or obese depending upon their BMI. Our website also gives users their required calories upon entering the details. The details include activity level and weight. On submitting the details, the users will get their daily required calories.

6. Proposed System

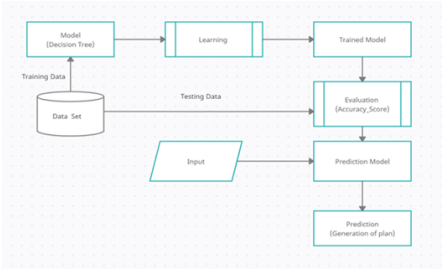

Fig. 3. Block diagram

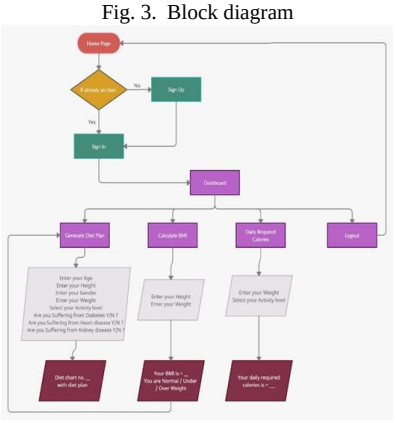

Fig. 4. Flow Diagram

The proposed system comprises following modules.

1) User Module

In this module, various pages have been developed via which all the data and contents related to the working and management of the "Automated Diet Planner" Project are displayed.

- *BMI Calculator:* In this the user provides the details of his height and weight and based on this his bmi is calculated and also he fits on which category e.g. Normal weight is shown.
- *Daily Required Calories:* Here the user enters the details of his weight and activity level i.e. sedentary, lightly active, moderately active or highly active and after clicking submit his daily required calories is shown.
- Generate Diet Plan: In this the user has to enter his/her details like age, height, gender, weight, activity level, and the diseases he/she suffering from Diabetes, Heart disease or Kidney disease and when he clicks on generate diet plan button. Different plans are shown based on the input.

2) Admin Module

The admin module in the website is provided by django itself. Admin features and functionalities will help the Administrator to modify the contents of the website. This will make the

website dynamic and easily modifiable.

1. Admin can add, modify and delete the users and their data.
2. Admin can view the Body mass index, Calories and Diets table in the panel.

7. Results

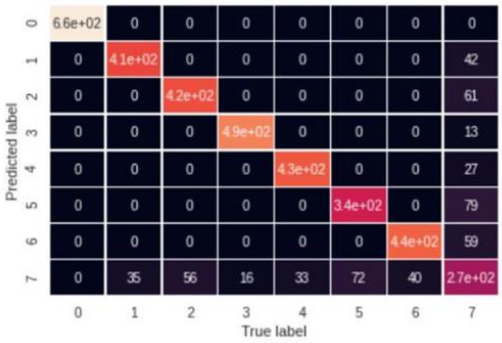

Fig. 5. Confusion Matrix

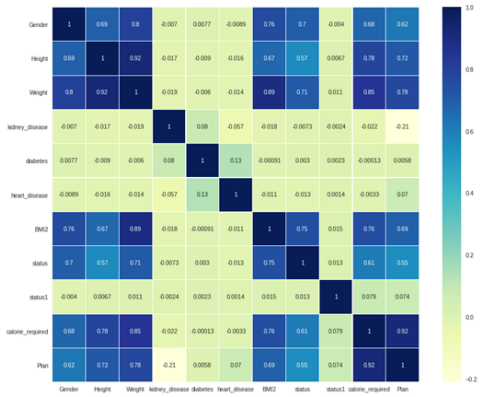

Fig. 6. Correlation Matrix

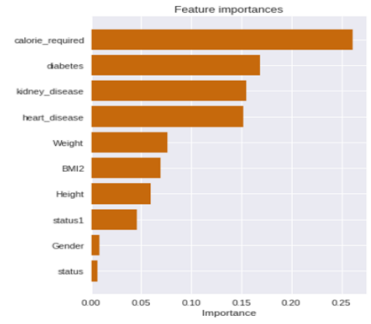

Fig. 7. Feature Importance

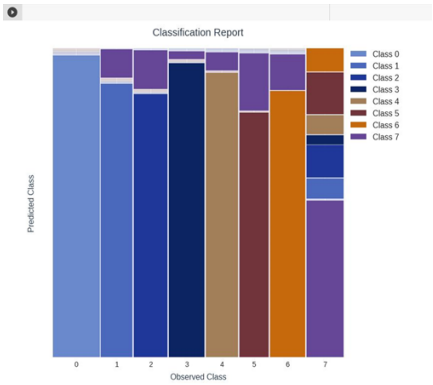

Fig. 8. Accuracy

8. Conclusion

To generate a diet plan for users, the classification model in Machine Learning was used. The framework used was Django to implement the logic and create a website. The algorithm used was Random Forest Classifier which is used for classification and to create a model. The presented machine learning model which is Random Forest Classifier has performed efficiently to generate diet plans for users. Users have benefited from the application system's assistance in accessing healthy eating information. Dietary recommendations are satisfied based on what the consumer requires and how many calories they require each day. A healthier diet and a lower incidence of obesity have been linked to meal planning. Despite the fact that no causality can be determined based on the findings, these study suggests that meal planning could be beneficial in the prevention of obesity.

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