

Disease Prediction and Diet Recommendation System Using Data Mining

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Abstract: - Nutrition is the basic necessity of each individual. We all wish to stay able-bodied and healthy in all aspects of life. Health can be maintained only by a nutritious diet. A healthy diet must include a list of eatables that fulfill the nutrition requirements of an individual. Proper diet is a paramount especially when the individuals are suffering from diseases. It is observed that women face various health problems when they reach the age of 30. They witness these predicaments due to the hormonal changes which is seen more in women as compared to men of the same age group. The system proposed in this paper is a personalized diet recommendation and disease prediction system. The diet recommendation system helps people suffering from various disease to envision what food items should include in their diet and what should be avoided. In addition, the system also prognosticates the disease or health issues people may face in the near future on the basis of the symptoms they give and the variety of food items they consume. Lastly the analysis done by the system over a number of women in a particular area will be put on a map using QGIS. This will facilitate the study of general health profile of women in a particular region. Thus, the system will reduce the burden of identifying necessary food items for their health condition that should be consumed thereby improving the health profiles of households.

Index Terms— Diet recommendation, disease prediction, QGIS based system

I. INTRODUCTION

A healthy life is the key need for every individual. A legitimate diet helps us to accomplish our need. Food provides us with all the necessary nutrients which includes carbohydrates, fats, vitamins, fibre, proteins etc. All these constituents of food gives us energy. Food pyramid helps us to get an idea of what diet to be consumed, what should be included in our diet. A single type of food cannot furnish us with all the mandatory nutrients. There has to be variety in the diet. Lack of apt diet will lead to body malfunction resulting some serious disorder. Health problems are more evident in women as compared to men of the age group 30 onwards. Women tend to handle all aspects of life, right from her children, family to her office and other extra outdoor work. In this busy schedule, they fail to take care of their health. Problems also rise due to hormonal changes, lifestyle, age and other body problems. Problems like anaemia, osteoarthritis weak eyesight, diabetes, menstrual irregularity, pain in joints, allergies, mood swings, migraine, obesity and many more are the common issues amongst women today. Then women go on medication to get cured. But, it is more favorable if they concentrate on befitting intake and desist such circumstances. A balanced diet is a cookie in each hand.

Therefore this system was designed to help women to procure way to diet chart and know what all edibles should be supplemented in their diet which will help them evade their health issues. All they have to do is enter the symptoms as input to the system and the system will detect the reason behind their problem. As a result the system will show them which constituents are deficient in their body, and accordingly will recommend the food items which will help to overcome the deficiency. At times the women are not even aware of what diseases they are facing. This system also predicts the disease that the women may be going through by using data mining algorithms on the food they consume and the symptoms they show.

II. RELATED WORK

Various researchers has contributed to this field. [1]SapoFitness: A Mobile Health Application for Dietary. This paper describes a mobile based application that helps users to maintain a proper and healthy diet .In this system the user has to enter some details such as sex, weight, height, age, current diet consumption, work, exercise, etc. and with the help of these details user's BMI is calculated stating whether the user is overweight or underweight. Based on

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the result a proper diet is recommended to the user. The system guides the way to decrease fats content in the user's body and suggests the item that will supply them necessary constituents. It is an alarm based system that keeps on notifying the user about the diet, in a timely manner. Its main aim is to encourage the users to enhance their physical strength with a proper intake and stay healthy. [2] Healthians: Smartphone app that can predict disease risks based on health inputs. It is a Smartphone based application that predicts disease risks based on the input provides to the system by the user. The app locks the details such as the lifestyles, abnormal symptoms, blood pressure, weight, sugar level, hemoglobin level, etc. and then analysis it considering every aspect. The system, as a results warns the user with all possible outcomes and also recommends the doctors or specialist if the level of risk is high. The app also suggests the users to change the diet or lifestyle or any other mandatory changes if necessary for their benefit. The best part is that the patient will be able to see all the reports and diagnosis done by the system in much lesser time decreasing the chances of complication of disease. This also makes the system transparent to the user and also the doctor can have a look on the diagnosis performed by the system. [3] Dietos : A recommender system for adaptive diet monitoring and personalized food suggestion. Dietos is a recommender system for adaptive diet monitoring and personalized food suggestion which complements the diet recommendation section of our proposed system. A health profile is created by the system based on the details that is given to the system by the patient. This health profile enables the user to get a brief summary about their health, and the disease that a person can face. This system recommends a proper food plan for healthy as well as a non-healthy person referring their profile. This system also recommends doctors or specialist if necessary. Dietos not only suggests the use of edibles apt for a well functional body but it also gives the dietary plan concerning some specific pathologies or health.

III. PROPOSED SYSTEM

The windows based application works for multiple users on the same system and can be installed over a number of systems. The system takes necessary inputs viz. name, age, height, weight, BMI, income i.e financial status, lifestyle, allergies and food consumption. After this, the user has to enter the symptoms of the illness faced by her to predict diseases. The system will then use data mining

techniques to classify the user in a fit or unfit healthy diet based on her health demands. Alternative food items will also be suggested based on the financial condition and allergies to specific food items.

A. DATA COLLECTION

The first phase of data collection involved conducting a survey from many dieticians to find out the most commonly existing diseases and allergies amongst women in the age group of 30-50 years. This gave the list of allergies and diseases which we have included in our system. Since the dieticians have monitored and rendered to the recent problems from which women suffer in this particular age group, we could obtain most relevant information about the problems women face. After collection of information from dieticians we conducted our second survey. We visited the women in various areas namely andheri, bhayander, chembur, thane and collected details like their personal information, food habits, income status, occupation, the kind of food they consume, the allergy they face and symptoms of diseases they may be experiencing. We have performed analysis of both the surveys so we are able to conclude which are the main allergies and illnesses faced by women so that they can be taken into consideration and fed into the system. The system will then be able to process and provide proper diseases prediction and recommendations to the user as the case may be. From the internet, the most common levels of the diseases was found out and considered. Also one factor that was highlighted was that BMI plays an important role when it comes to diet recommendation. We thereby included it in the system thus providing users an insight of their BMI value and which category they belong to, namely; underweight, normal or overweight.

B. DATA MINING

The data mining technique that is used in the proposed system is Naïve Bayes.

Naïve Bayes:

The Naïve Bayesian classifier is base

The Naive Bayesian classifier is based on Bayes' theorem with independence assumptions between predictors. A Naive Bayesian model is easy to build, with no complicated iterative parameter estimation which makes it particularly useful for very large datasets. Despite its simplicity, the Naive Bayesian classifier often does surprisingly well and is widely used because it often outperforms more sophisticated classification methods. [4]

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$P(x|c)P(c)$

category. The system will predict the diseases the user is most likely to get, and will also recommend a

$P(c|x) =$

$P(x)$

Here,

- $P(c|x)$ is the posterior probability of class (target) given predictor (attribute)
- $P(c)$ is the prior probability of class.
- $P(x|c)$ is the likelihood which is the probability of predictor given class.
- $P(x)$ is the prior probability of predictor

C. RECOMMENDATION

A good health leads to good life and for a fit health we need an apt food. The proposed systems aim at recommending it's user a proper and healthy diet for people to stay healthy. Using data mining algorithms the system will analyze the input fed to the system by the user and accordingly will conclude the health risk that are likely to occur and will recommend the necessary food chart. The diet or food recommendation is done not only on the basis of the health risk but factors such as lifestyle, income, BMI, etc is also considered. The proposed system also awares the settlement of a particular region using QGIS about what health risks they are more prone to or what edibles should the regional people include in their diet. The QGIS mapping is based on the survey made in that region and a tentative conclusion is made by taking the opinion of the specialist and doctors. This will not only help the women but also the men of that region to improve their health and avoid future health issues

IV. CONCLUSION

A diet recommendation system using data mining technique helps it's users to get a proper diet chart and a list of edibles that are essential for a healthy life. The system also predicts the risk that the user is prone to get and accordingly tries to suggest the solution to it as well.

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