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E-Health and Fitness Recommendation System Using Machine Learning

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Abstract: Today, more people suffer from chronic diseases due to not following the right weight loss plan, not exercising properly, or not paying proper attention to the diseases anymore due to busy schedules. In the modern world, fitness and health play a fundamental role in human life. People prefer a healthy lifestyle that can be achieved through regular physical activity and a healthy weight loss plan. Due to the lockdown and people staying at home anywhere, humans cannot cross to exercise places like gyms, public parks, or perhaps for walks. So cut your odds, our Fitness & Health Recommendation System challenge aims to give our users access to a wide variety of fitness videos and personalized content based on user probabilities. On the same platform, the person can access a weight loss plan chart based on their optimum weight, which calculates their BMI (Body Mass Index). Healthy food suggestions also categorize the user as healthy or unhealthy based on age, weight, height, red blood cells, white blood cells, hemoglobin, platelets, sugar, etc., are available.

Keywords: Health Monitoring, Diet and fitness recommendation, collaborating filtering system.

I. INTRODUCTION

Fitness is also an important thing in human life. Due to busyness and workload, a person is not able to pay attention to his health and fitness. The physical condition of inactivity is the most important problem of the present generation. Maintaining your daily routine of eating and exercising is what people need to stay healthy. Therefore, humans need a small amount of nutrients to be healthy and maintain their health. Diet and exercise, if well-remembered, vary according to users with specific constitutions, height, weight, gender, age, and hobby level. Diet and exercise are related. Balanced energy intake is essential to maintain blood sugar levels. Therefore, the proposed system can help doctors prescribe weight loss and exercise plans to patients with diabetes, blood pressure, or thyroid disease, along with the medications they administer at

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each follow-up with their mouse blood pressure.

In this paper, we modelled a health monitoring system with diet and fitness recommendations. We specifically mention three diseases in this recipe, namely diabetes, blood pressure, and thyroid. These diseases are more common in humans and require proper health monitoring and treatment. The advice machine will provide data based on the needs and limitations of the user. We divide our machine into 2 modules 1. Health monitoring system 2. Diet and exercise recommendation. For the Diet and Exercise Recommendation module, classification C4.5 is used. It has additional features such as pre-pruning, consistent handling of missing attributes and values, and adding rules that help improve model accuracy compared to normal selection tree classification. A number of comparisons are made to find the ideal set of rules for the advisory device. ID3 and C4.5 have been realized and meet optimal conditions with the following features regarding algorithm and C4.5 habitats.

The Internet and related technologies have become essential tools for accessing products, services, or information often needed in our daily lives, for example, booking a hotel, buying a new tool, or getting the weather forecast. It is said that we spend an average of 6 hours on the Internet daily. Amidst this trend, there is a growing interest in finding useful resources on the Internet for adopting a healthy lifestyle, for example, finding and sharing statistics related to health practices and fitness methods. Fitness, or through phone apps. Although gyms and recreational facilities are not uncommon desires for clients who choose to adopt them to maintain an active lifestyle, they may not always be within everyone's reach, for example, due to financial constraints. Busy schedules, frequent visits., etc. Predicting the first healthy food-eligible segment is also a difficult project. Using the category algorithm, we can predict whether a person is healthy in a healthy food database based on age, weight, hemoglobin, blood pressure, blood organization, sugar, platelets, RBC, and WBC is not using variables like Taking advantage of the growing demand for online resources to sell exercise; online exercise videos have increased in recent years with various high-quality features as an opportunity to keep consumers active from the comfort of home or past.

II. LITERATURE SURVEY

E. Palomares Carrascosa [1]. In their paper "Fitness that fits" proposed a model for workout video recommendation, using

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the Youtube-8M labelled dataset and its rich variety of categorized video labels, thereby enabling fitness workout video recommendations predicated on the users' preferences and their recent viewing behaviour. YouTube provides millions of users with access to a wealth of video resources to support them in practicing their preferred work- outs anywhere and anytime. As a result of classification and supervised machine learning processes on data originating from YouTube videos, Youtube-8M incorporates labels associated to the videos, thereby describing the topic(s) to which they belong, including a number of fitness activity types: this amount of labelled video data has an untangled potential to investigate and enhance existing recommendation approaches on large volumes of video related to specific domains such as fitness.

Butti Gouthami, Malige Gangappa presented [2] in 'Nutrition Diet Recommendation System Using User's Interest' they discuss nutrition recommendations based on BMI calculations which focuses on daily diet plan and nutrition needs. According to user food preferences and consumption we get suggestions, food nutrition's, deficiencies and tracking historyof his food habits. Content-Based Filtering and Collaborative Filtering methods are used to get users choice of his food recommendation for the daily nutrition with the help of USDA dataset and grocery data. A healthy food pyramid is a combi- nation of plant foods, moderate amount of animal products. Which includes vegetables, grains, fruits, oils and sweets, dairy, meat and beans. Generally, a person remains unaware of major causes behind deficiency or excess of various vital substances, such as calcium, proteins, and vitamins, and how to normalize such substances through a balanced diet. With the advantage of technology, the people can leave a healthier lifestyle. In this project to build a system that will aim to recommend appropriate nutrition intake to its users based on body mass index (BMI) and grocery data preferences. BMI calculate weight status categories which includes underweight, healthy weight, overweight, obese. Grocery data includes seasonal food, user's interested food, plant foods and animal products. This project will help users' daily diet recommendations along with BMI range, healthy food choice, eating behaviour, health problems, and to change user behaviour.

James Davidson, Benjamin lieblad, [3] proposed the YouTube Video Recommendation System. They discuss

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the video recommendation system in use at YouTube, the world's most popular online video community. The system recommends personalized sets of videos to users based on their activity on the site. They discuss some of the unique challenges that the system faces and how they address them. In addition, they provide details on the experimentation and evaluation framework used to test and tune new algorithms. [4] Bernard's , In the survey work of authors conclude that the field of social Recommenders Systems (RS) built on implicit social networks seems particularly promising, propose a social filtering formalism, and with their experiments on music and movie preference datasets, they find that one has to test and try a full repertoire of candidate RS, fine-tune parameters and select the best RS for the performance indicator he/she cares for a Authors study the efficiency of social recommender networks merging the social graph with the co-rating graph and consider several variations by altering the graph topology and edge weights. With experiments on the help dataset, they conclude that social networks can improve the recommendations produced by collaborative filtering algorithms when a user makes more than one connection.

In this work, we consider our recommendation system to be a social one as a) it applies to the social network of the users of the application, but also b) it can integrate social graphbased information to enhance the recommendation process. The literature survey performed so far shows that most works employ existing datasets from music or movie rating networks to experimentally evaluate the models or algorithms proposed, but none of them applies the proposed solution to a real-world application

III. EXISTING SYSTEM

A recommender system will help us to follow user preferences and requirements and allow us to adjust diet and exercise video recommendation. A similar work is done in 'Fitness that Fits', a prototype platform for workout video recommendation, which relies on Youtube-8M video data describing fitness activities based on a hybrid approach incorporating basic principles from content based and neighbourhood based collaborative filtering systems to provide end users fitness video based on their profile. Their approach relies on (a) dataset by filtering the original Youtube-8M labeled video dataset and filtering based on Highly viewed, Fitness-related, Videos having machine generated

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annotations of 'Beauty and Fitness' narrowed down to 16 labels, associated with highly viewed and popular types of fitness activities. In this system, they consider user preferences and their watching history to model a recommender system. After gathering this information, a diverse recommendation is made to the user to increase user engagement, that is recommendation of videos that the user might not have seen, and the user might watch. Another existing system is CoCare. It recommends videos about physical activity based on a user profile, his/her context. The main challenge of CoCARE is the small set of videos to be recommended, because the selection of the videos is done manually by health experts. Several health recommender systems have this same problem. Today there are many videos which are available on the Internet related to physical activity. These could not be included in the database of CoCARE; because these do not have enough information to be categorized and profiled. Another existing system that uses user interest to make diet recommendations is one that uses USDA database nutrition factor information for each individual food item. The values needed to calculate BMI (body mass index) must be provided as an input for the final diet recommendations to be calculated.

IV. PROPOSED SYSTEM

Extending the existing module by taking the implicit and explicit preferences from the users like ratings given to the videos by a community of users. One of the aims of the proposed system is to provide users with recommended videos that are both relevant (in accordance with their current preferences) and diverse. Diversity in workout recommendations may not only help exploring "new" types of workouts the user might potentially like, but also fosters variety of workouts in such recommendations to prevent an eventual sense of boredom Two sources of user data are taken as an input to model their current preferences: the user profile and the recent user behaviour.

A) RECOMMENDER SYSTEM

Collaborative Filtering, which is also known as User-User Filtering, is a technique which uses other users to recommend items to the input user. It attempts to find users that have similar preferences and opinions as the input and then recommends items that they have liked to the input. There are several methods of finding similar users (Even some making use of Machine Learning), and the one we will be using here is going to be based on the Pearson Correlation Function. We read the data having video

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titles and ratings and BMI. The recommendation is based on the likes and ratings of the neighbours or other users. Each user has given multiple ratings for different videos. The process for creating a User Based recommendation system is as follows:

- Select a user with the videos the user has watched
- Based on his rating to videos, find the top X neighbors
- Get the watched video record of the user for each neighbor
- Calculate a similarity score using some formula • Recommend the items with the highest relevance

To find the similarity of users to input users we are going to compare all users to our specified user and find the one that is most similar. we're going to find out how similar each user is to the input through the Pearson Correlation Coefficient. It is used to measure the strength of a linear association between two variables. The formula for finding this coefficient between sets X and Y with N values can be seen in the image below

B) DESIGN AND IMPLEMENTATION

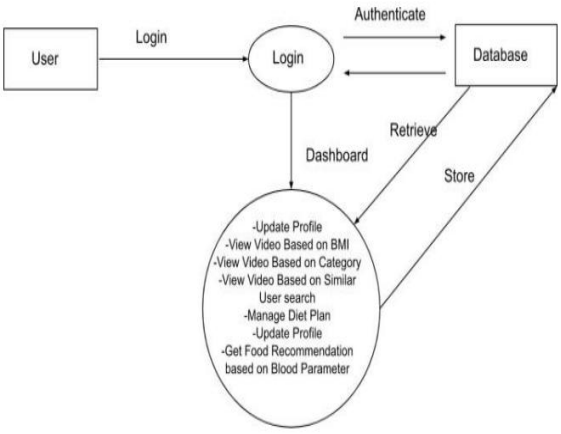

Fig.1 Flow chart

V. RESULTS

a) Precision

Precision is concerned about how many recommendations are relevant among the provided recommendations

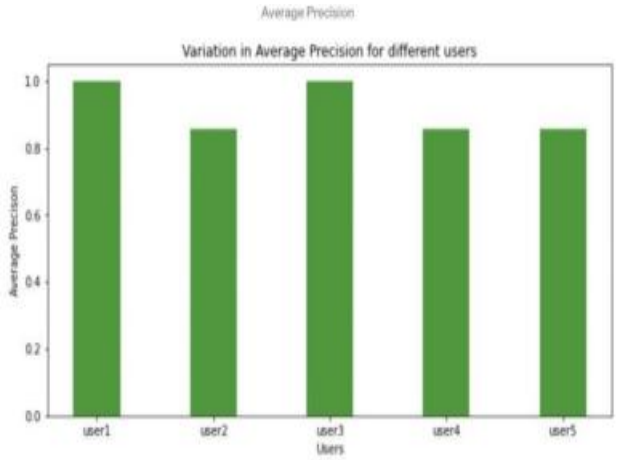

Fig.2 Precision

b) Recall

Recall is concerned about how many recommendations are provided among all the relevant recommendations

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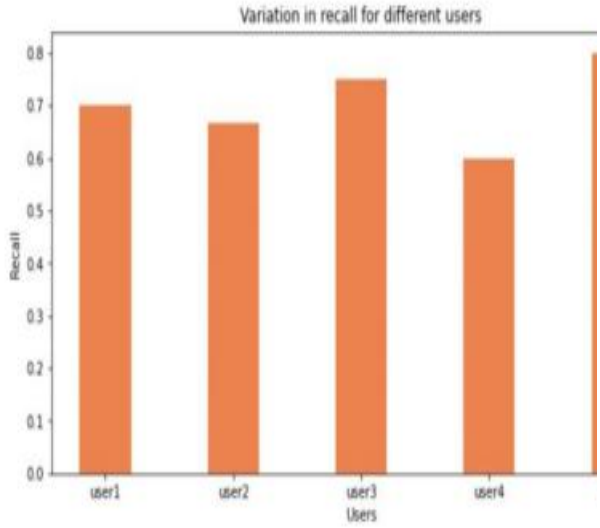

Fig.3 Recall

c) AVERAGE PRECISION@K

AP@K is the sum of precision@K for different values of K divided by the total number of relevant items in the top K results

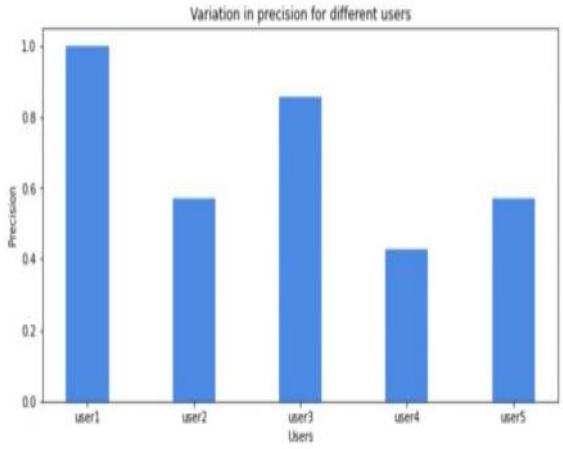

Fig.4 AP@K

VI. CONCLUSION

B-Fit: A Fitness and Health Recommendation System, aims at bringing access to our users a wide range of fitness videos and personalized content based on the user preferences. Video recommendation within the fitness domain to support an active lifestyle. It is a platform for workout video recommendation, which benefits from the Youtube-8M labelled dataset and which has a rich variety of categorized video labels. The main objective of this project is a recommended model that extends principles from content based and collaborative filtering by introducing mechanisms to provide end users with meaningful and diverse workout video recommendations. Classifying a user as healthy or unhealthy based on blood test parameters and predicting healthy food based on the factor of the blood test that they are lacking. The scope of the project is that they are convenient, providing 24/7 access to a wealth of fitness resources from anywhere with an Internet connection. They do not require commitment to work out at an externally imposed day or time. With a careful search and use of the resources available, they provide a wealth of workouts from a diversity of instructors. They are cost-effective and can be undertaken in a more individual and private space.

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