Outfit Recommender System using KNN Algorithm

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***Abstract*— Thirst for outfit has never ended even though centuries pass away. Everyone wants to look and feel good. So we have proposed an outfit recommender system that will recommend the outfits based on user ratings by KNN algorithm. The K-Nearest Neighbour algorithm is used to detect the nearest neighbor or a cluster based on the k value. In our recommender system, we have not only recommended dresses but also other outfits such as backbags, heels, handbags, etc. The top three rated outfits are displayed to the user. Here we are trying to reduce the user confusion on which outfit will match for their existing outfit. As the recommender system uses the description from the user, the error rate encountered is low.**

Keywords: Outfit, K-Nearest Neighbour Algorithm, User ratings, Top three ratings.

I INTRODUCTION

It is the generation where everything is available at online. But the confusion is what to choose and how to choose. There are variety of outfits available in the market for various occasions. Here an "outfit" refers to a set of clothes worn together, typically for certain desired styles[3]. Though we have got a best tops we don't know what to mix and match for it from the variety of bottom we have. This situation prevails for all types of outfits. This is because we want to expose ourselves to the society in a trendy and a lookable way.The internet has also provided with various applications from where we can get suggestions online. We can exclusively choose the dress among the diverse variety. The fashion websites contain a variety of photographs that serves as the reference[1].There are various types of outfit available in the market. Few of them are those can be worn on occasions, parties, meetings, casual, etc. There are few people who put attention to their environment and not to their outfit[2].

The recommender system recommends the user based on the type of filtering used. There are two major types of filtering collaborative filtering and content based filtering. The collaborative filtering is completely based on the user's behaviour whereas the content based filtering is based on categorizing the content viewed by the user. We have chosen the collaborative filtering method. The user ratings are collected and are classified based on KNN algorithm.

In the K-Nearest Neighbor algorithm a thing is classified based on the majority of the votes. If the votes are similar then they are grouped and termed as neighbors. In general, the value for k is small and it is always a positive integer. Grouping the values using this algorithm is quite easy as the whole neighbor depends on the k value only. Similarity constraints and distance values are based on the user ratings. It is completely a user based recommendation system.
Fig(1.1) represents the sample picture of best outfit. Our main aim is to recommend the best outfit to the users.

Fig 1.1

II RELATED WORK

The fashion domain is a large domain and the majority of the work is still inresearch area. There are also studies that reveal the compatibility of the items chosen[3]. The recommender system tried to recognize the images from the videos in the earlier systems. Here the proposed a system will recommend the outfits to the user based on the earlier user ratings. We have used K-nearest neighbor algorithm to detect the ratings of the user. Every time when the user gives ratings, the average value with the previous ratings is calculated and stored. The KNN algorithm is implemented on the user ratings collection to detect the next nearest ratings in the product specified. We have used Euclidean distance function to find the distance between them. This distance function predicts the values easily and the top three ratings are displayed to the user. If the user is satisfied with any one of the images chosen he/she can rate the outfit on a scale five that are in star format. In the star format one star is the least rating and five star is the highest rating. The admin has the rights to add the outfit, see user ratings and total number of users present in the system. Any new product that has to be uploaded in the recommender system should be done only by the admin. Our recommender system showed satisfactory results for the outfit uploaded by the user with reduced error rate from earlier methods.

III PROPOSED MODEL

We are motivated by the various fashion websites prevailing in the market. Fig1.2 depicts the architecture diagram for our recommender system.Fig1.2 describes our architecture diagram. There are two access granted in our recommendation system**. (1) Admin. (2) User.**

Admin: He/she is the person who has the rights to add the products and update the product details. Admin name has to be directly added to the database. The product has to be added along with its color description. Any outfit can be added by the admin.

User: The user can either be an existing user or a new user. The new user has to register with our system. After they are logged in, they are displayed with three options.

(1)Out of the box: The out of the box displays the user specified outfit for the image of the outfit uploaded by the top three rated outfit directly without any criteria.

(2)Matching outfits: The user is asked to describe the color of the outfit uploaded. The matching outfit displays the outfit that is equivalent to the color that is described. The top three matching outfit based on the rating is displayed.

(3Contrast outfits: Here also the user is asked to describe the color of the outfit uploaded. The three contrast color for the color described by the user is obtained and the top three rated contrast outfits are displayed to the user.

We have set our threshold value as three for the convenient view of user. This method showed very low error rate.

IV METHODOLOGY AND ALGORITHM

(1)*K-NEAREST NEIGHBOR ALGORITHM:*

An outfit is classified by a majority vote of its neighbors. The nearest neighbor is classified using the distance function. There are various distance functions available like Euclidean function, Minkowski function, Manhattan function. We have used Euclidean algorithm to calculate the distance. The k value taken will be generally small and will always be a positive integer. Here we have taken the maximum value as our k value. As the value will be between 1 to 5, it is easy to calculate.

(2)Eucledian distance function:

$$(Q,P)=\sqrt{\sum_{i=1}^{n}(Qi-Pi)^2}$$

If the distance is less then it is the nearest and if the distance is more then it is farthest. If the value between the ratings is more than two then it is not considered as neighbor.

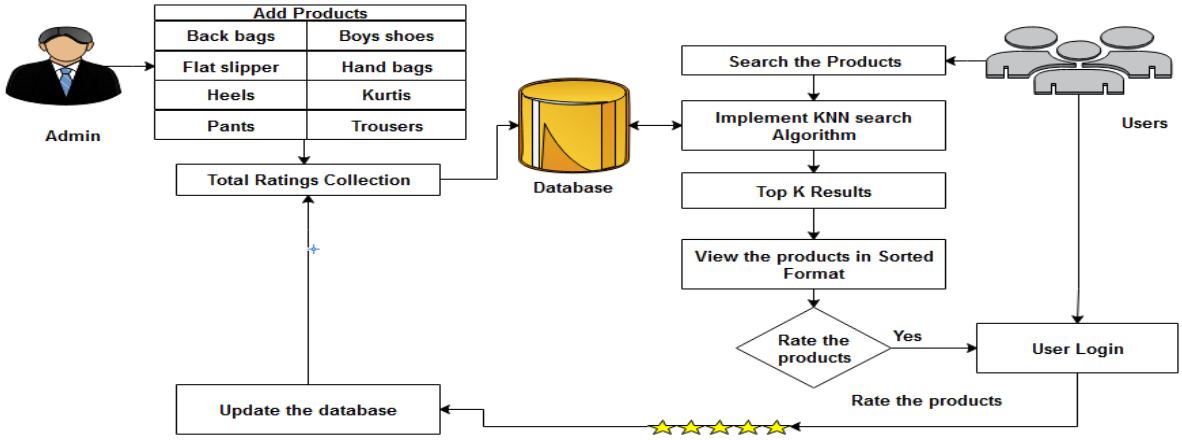

Fig 1.2

V IMPLEMENTATION AND RESULT

Once the user is registered in the system he/she is allowed to upload their outfit and the choices of the outfits like kurtis, backbag, heels, etc. are displayed in the drop down list. Once the user selects the needed item the rated products are displayed based on their interest in any one of the following like Out of the box, matching outfit, contrast outfit.

Fig 1.3 describes the results shown when the user needs the highest rating products at a time without any constraint. Fig 1.4 describes the result shown when the user needs the same color outfit.Fig1.5 describes the contrast outfit .If the user likes the product then they can give their ratings in star format starting from one star, denoting the least to five denoting the highest.

OUT OF THE BOX
SLNo
Type
Product
Deatils
Rating
Status

Fig 1.3

MATCHING OUTFIT
SLNo
Type
Product
Deatils
Rating
Status

Fig 1.4

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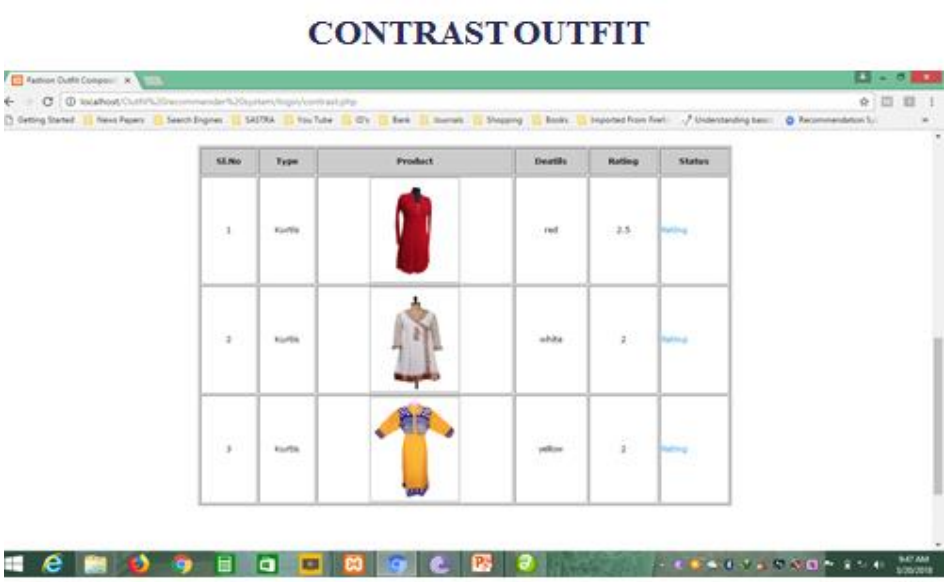

Fig1.5

VI CONCLUSION AND FUTURE WORK

We have tried to reduce the error rate encountered in the previous method. As it is top three ratings there is the repetition of the color displayed in the contrast outfit. We have tried to increase the number of rated products. Also we have decided to display the link where the user needed outfit is available in near future.

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