Product Recommendation System

Tahira Salwa Rabbi Nishat
dept. of CSE
Ahsanullah University of Science and Technology
Tejgaon, Dhaka, Bangladesh
nishat.rabbi@gmail.com

***Abstract*—This is a Product Recommendations system made with PHP as scripting language. It was made using user based collaborative filtering algorithm.**

***Index Terms*—user based collaborative filtering, recommendation system, php recommendation system.**

I. Introduction

Product recommendation system is used in many e-commerce website nowadays. It helps the users/buyers to find similar products that they might be interested into buying. First, the system finds the similarity of products bought by users.Then with similarity and ratings given by the users, the system suggest then other products.

II. How the System Works

This system is created using PHP. So, after opening xampp and connecting Apache and MySQL, we need to open any browser and type http://localhost/ProductRecommendationSystem on the addressbar. The index page will be shown. As I already have inserted some data in the sql, the index page shows as follows:

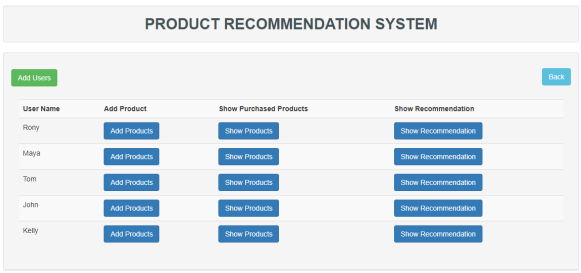

Fig. 1. Index page

Then if we want to add user to the system, we need to click on the $AddUser$ button. It will redirect to another page as follows, where we can insert username.

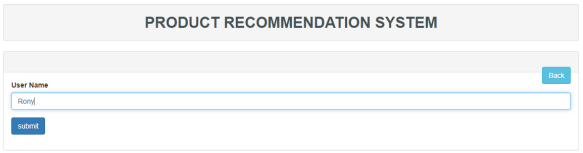

Fig. 2. Add User page

Going back we can add product for any user by clicking on the $AddProduct$ button next to any user.

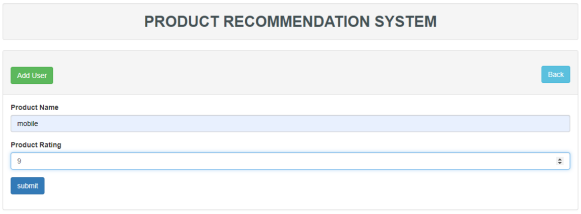

Fig. 3. Add Product page of user 1

We can see the which products are bought by any user by clicking on the $ShowProduct$ button next to each user.

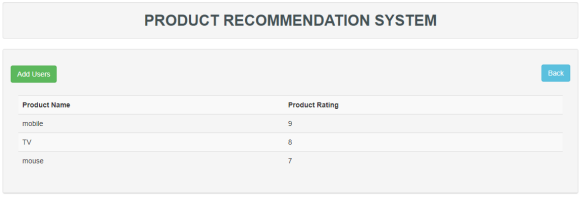

Fig. 4. Show Purchased Product page of user 1

Finally, We can see the recommendation of products for each user by clicking on the $ShowRecommendation$ button next to each user.

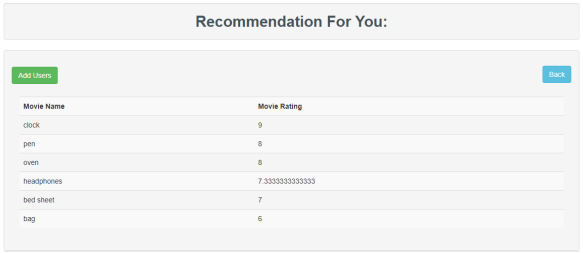

Fig. 5. Recommendation page of user 1

III. Methodology

- First I have made a matrix on user/purchased Product according to their ratings.

TABLE I
USER/PRODUCT MATRIX ACCORDING TO THEIR RATING

user/product	mobile	TV	mouse	pen	bag	headphones
Rony	9	8	7			
Maya			8	8	6	
Tom	9					7
John		7				8

- Then I calculated the similarity using Euclidean distance, for any user to other users where they are any product bought in common.
  Euclidean distance formula:

$$d(x,y) = \sqrt{\sum_{i}^{n}(x_i - y_i)^2}$$

- Then I have calculated the similarity for every user with other users and normalized them. For example: Rony and May bought mouse in common, their similarity = $\sqrt{(7-8)^2} = 1$, after normalizing like $\frac{1}{1+similarity}$ = $\frac{1}{1+1}$ = 0.5

- Then, I calculated the recommendation for each non-bought product using user based collaborative filtering formula which defines as follows:

$$p(u,i) = \frac{\sum_{N \in SimilarTo(i)}(S_{i,N} \times R_{u,N})}{\sum_{N \in SimilarTo(i)}(|S_{i,N}|)}$$

  Here, $p(u,i)$ is prediction of the rating of user u given item i, $R_{u,N}$ is rating of user u given item i and $S_{i,N}$ is the similarity between i and N.

IV. Conclusion

The Product Recommendation System worked smoothly on given context.