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Cost effective personalized recommendation algorithm for internet users to browse news

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Abstract: The algorithm that use for the recommending the news are graph based collaborative filtering algorithm which costs high in computation and its maintenance, so this paper mainly focus on propose to use the slope one algorithm which can recommend the news with low computation cost, and I propose some simple technique to take on the drawbacks of the slope- one algorithm..

Keywords-component; pre-recommendation, cold-star problem, slope-one algorithm, item based recommendation, computing deviations.

I. INTRODUCTION

People may not shop daily. But they read online news daily, but compare to the recommendation technology using in the e – commerce website the recommendation technology fall behind in the news recommendation systems. The recommendation algorithm need to mine the user interested news and propose to the users to read, this is called personalized news recommendation. The aim of work is to generate pre – recommendation, solve the cold – start problem and make recommendations using slope one algorithm.

II. SYSTEM DESIGN

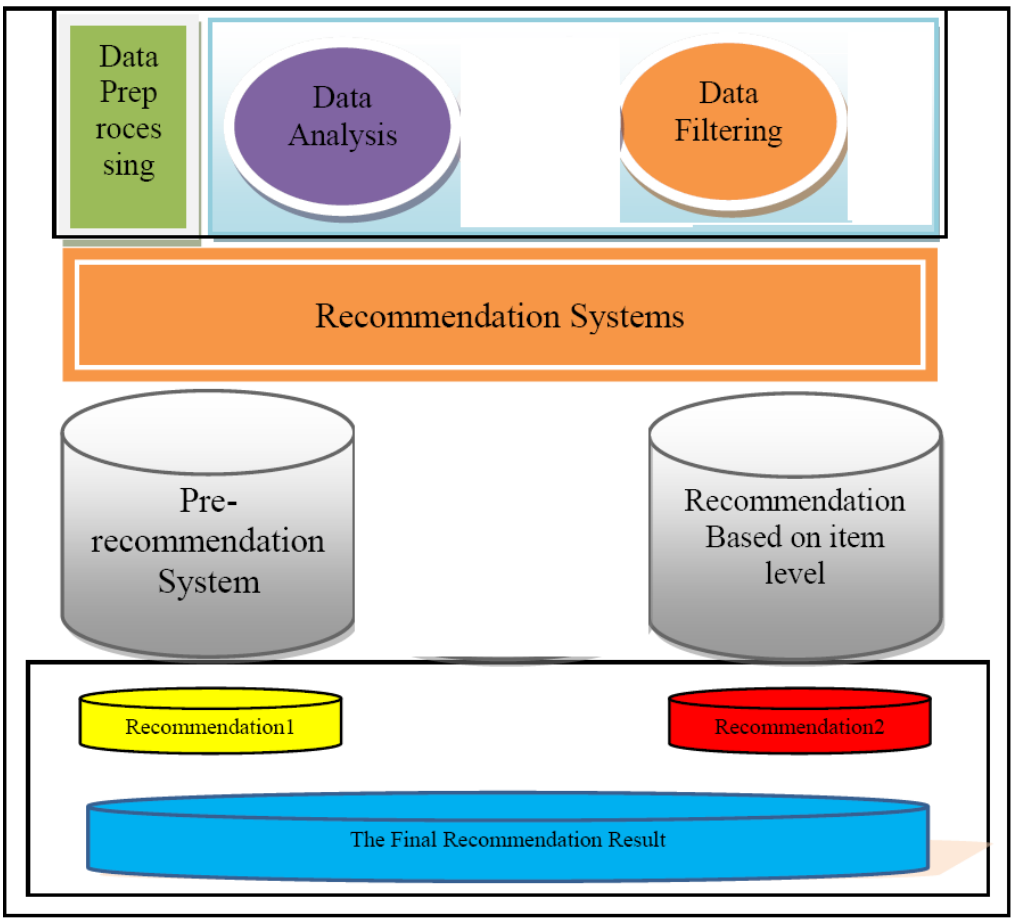

Figure 1. The flow diagram of generating recommendation

The figure 1 shows the design of the system, which generates the recommendations. The final recommendations done by filtering the recommendations from two recommendations process. They are pre – recommendations and recommendation based on the item level. In generating of pre-recommendations, it selects only few of the news which is

select randomly from all the news categories. It is done by the data pre processing, this the query run by some simple sql queries, which can run without having dense operations inside. The pre recommendations give to the all users at first of the code running. This data is displayed by having the filtering of the new news in every categories and recommend the users select the news which interested in. After providing the pre recommendations to the users, the user does select the news he likes. And the algorithm only keeps on recommending the further news to the user by recommending only news belonging to the same category. Means, if user select the cricket news in the pre recommendation, next the system keeps on recommending only the news categorized to cricket category.

III. SYSTEM IMPLEMENTATION

To make the recommendation system cost effective, I used the one of the best algorithm in the item-based recommendation technique, That is: Slope-one algorithm. The slope one algorithm is the best algorithm which runs mainly in two steps.

- Step-1: computing the deviations
- Step-2: Recommending the items by predicting the users rating.

For computing the deviations

$$\mathbf{deviation_{i,j}} = \sum_{\mathbf{item} \in \mathbf{S_{i,j}(X)}} \frac{\mathbf{item_i} - \mathbf{item_j}}{\mathbf{pair(S_{i,j}(X))}} \quad \rightarrow \quad \mathbf{Eqn1}$$

The above eqn1 explains the how the computation of the deviations performs in the algorithm. The deviations computed is stored in the vector form, it is the summation of the item i and item j ratio of the pair(s,x). Where pair(s,x) represents the users who rate both the item i and item j.

For computing the predictions

$$\mathbf{Prediction^{s1}(u)_j} = \frac{\sum_{\mathbf{i} \in \mathbf{S(u)} - \{\mathbf{j}\}} (\mathbf{deviation_{j,i}} + \mathbf{u_i}) \mathbf{c_{j,i}}}{\sum_{\mathbf{i} \in \mathbf{S(u)} - \{\mathbf{j}\}} \mathbf{c_{j,i}}} \quad \rightarrow \quad \mathbf{Eqn2}$$

Here prediction is predicting the value of the user u with respect to item j using slope one algorithm, and the I belongs to S(u) returns the list of items which the users not rated for. Here the prediction value is some fraction value range form -1 to +1. According to it the values for the items where the users not rated is computed and sort into ascending order. Most value is recommend at the first to the user to read the news. One problem of the item level recommendation is the cold start problem, I encountered this problem by using the simple queries and forcing the users to rate the item, since the user not rate anything it is impossible to recommend the items to him.

IV. CONCLUSION

The proposed method is very best cost effective algorithm since it is not create much burden of creating the bi-partite graph kind structure. So it is very easy to maintenance and can recommend the more perfect recommendations to the users.

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