2.2   Recommendation using Association Rules

Load the package recommenderlab and read the log1.csv file (it is an expansion of log.csv with u7 and u8).

6. Obtain a recommendation model using association rules with the first 6 users. For that purpose:

(a) start by coercing the data frame with user-page access information from the log1.csv file to a binaryRatingMatrix (brm);

(b) select the information on the first 6 users to be used as training offline data and save it to a new variable (e.g brm_offline);

(c) inspect the content of brm_offline; use the function getRatingMatrix and getData.frame;

(d) apply the functions rowCounts and colCounts to brm_offline; what information does it give you?

(e) apply the function image to brm_offline;

(f) obtain the recommender model based on association rules with the instruction:

modelAR <- Recommender(brm_offline,"AR")

(g) apply the function getModel to the obtained model and then inspect the association rules that compose the model.

7. Suppose that u7 enters the system and becomes an active user. Deploy the recommendation model for him/her.
    For that purpose:

(a) apply the predict function with the model and the rating matrix of the user, such that only the top 2 recommendations are given as output.

(b) apply the function getList to the obtained predictions to inspect the actual recommendations; which are they?

(c) to comprove the obtained recommendations, filter the rules which have been triggered for this active user.

8. Now suppose that u8 enters the system and becomes an active user. Deploy the recommendation model for him/her. Be critical regarding the results.

9. Explore the types of recommendation models available for binary rating matrices.

recommenderRegistry$get_entries(dataType ="binaryRatingMatrix")

10.   Make the top 2 recommendations to u7 and u8 using the popularity of the pages, instead of association rules. Try to understand the obtained recommendations.

2.3 Recommendation using Collaborative Filtering

Binary Rating Data

Considering the same binary rating matrix of the previous exercise brm_offline, build a recommendation model based on collaborative filtering.

11. Start by using the function similarity to build the similarity cosine matrix (only for first 6 users):

    a) a user-based approach
    b) an item-based approach

12. Obtain the top 2 recommendations with user-based CF and item-based CF methods using the cosine similarity with a neighborhood of size 3, for:

    c) active user u8
    d) active user u7.

Non-Binary Rating Data

13. Explore the types of recommendation models available for real rating matrices.

recommenderRegistry$get_entries(dataType ="realRatingMatrix")

14. Read the file log1Ratings.csv, containing information on the ratings given to web pages by a set of users, into a data frame in R. Build and deploy the following collaborative filtering recommendation models using, again, the first 6 users for training:

    a) a user-based CF approach with two neighbors to predict the ratings of users u7 and u8
    b) an item-based CF approach with two neighbors to predict the ratings of users u7 and u8.