INFDTA01-1 Recommendation systems Practical assignment, part 2: Item-Item

Objective: implement a recommender system based on collaborative filtering, using the Item-Item technique.

Steps to follow:

a) Implement the ***slope one*** algorithm with the following functionalities:
   - Given a dataset of ratings, compute the *deviations* between all pairs of items and store them in a specific data structure;
     i. Given two items, remember to store (together with their deviation value) also the number of persons which rated both items. This way, updating deviations will be easier and quicker.
   - Given a user and an item, compute the predicted rating of such item for that user;
   - Given a user, compute for him/her the set of n top recommendations;
   - Given a new item rating (user-id, item-id, rating), execute the needed updates to the deviations between items. Think about *which* deviations you need to update.

b) Apply the algorithm…
   - To the small dataset of Assignment 1 (*userItem.data*):
     i. Create the predicted ratings for user 7 (items 101, 103, 106).
     ii. Create the predicted ratings for user 3 (items 103, 105).
     iii. Suppose that user 3 rates item 105 with 4.0. Update the deviations and compute again the predicted ratings for user 7. Which of the three predicted ratings (items 101, 103, 106) change and which stay the same? Explain why that happens.
   - To the MovieLens dataset 100K:
     i. Create the 5 top recommendations for user 186 and display their predicted rating
     ii. How much time does it take to create a recommendation for a user (*excluding* the computation of the deviations)? If your algorithm is slow, what would you change (if you had time) to make it better?