COMP3208 - Social Computing Techniques Module Assignment

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Theoretical Introduction

A recommender system is a technology that involves two side of the same coin: *users* and *items.* Items could be products, movies, events, articles that are going to be recommended to users such as: customers, app users, travellers. We can relate the concept of recommendation to a real life situation: if you think to a small shop or boutique, then it's usual that a merchant knew personal preferences of everyday customers; his high quality advices satisfy clients increase profits and visibility of the shop (thank also to the usual word-of-mouth between people).

When dealing with online market places (Netflix, Amazon, Ebay or Asos), personal recommendations, suited up for each particular and different user, can be generated by something that can be seen as an "artificial merchant": the **recommender system**.

There are several definitions that we can find in the literature and in the *Internet.* Quoting Wikipedia:

"A recommender or recommendation system (sometimes replacing "system" with a synonym such as platform or engine) is a subclass of information filtering system that seeks to predict the "rating" or "preference" that a user would give to an item".

In our opinion such definition is not completely correct; recommender systems are more than what stated. We can think about it as an *personal assistant*, because it can help you in order to make the right decision when you're going to buy something. Moreover, it knows your preferences and tastes; therefore it's not only a machine or an IT system: it perfectly suits you. A more proper definition could be:

"A recommender systems is a system that help users discover items they may like, based on a sort of personal knowledge of each user".

Formally, such systems filter different items after studying a personal profile. They differ from many other information filtering systems, such as standard search engines and *reputation systems*, because recommendations are made on the specific user or group of users. We want to stress that the main goal for a recommender system is to show the user what he may like, guiding him on a platform that potentially offers a wide and heterogeneous set of choices. To achieve this purpose, the system can adopt different *user* or *item-based* models such as: the given rates to different items, preferences on distinct items typologies, either *demographic* or *context* information.

After the design of a good model, we need to find a way to elaborate this huge amount of information in order to extract the peculiarities between users and items that allows to achieve good recommendations.

MATLAB Approach

Our first idea was to evaluate the similarity matrix with MATLAB, given that it is naturally optimized for operations with matrices and vectors.

C++ approach