COMP 4601A
Fall 2022 - Lab #8

Objectives

The goal for this lab is to compute the mean absolute error of an experiment using the “leave one out” strategy explained in the lecture on evaluating recommender systems.

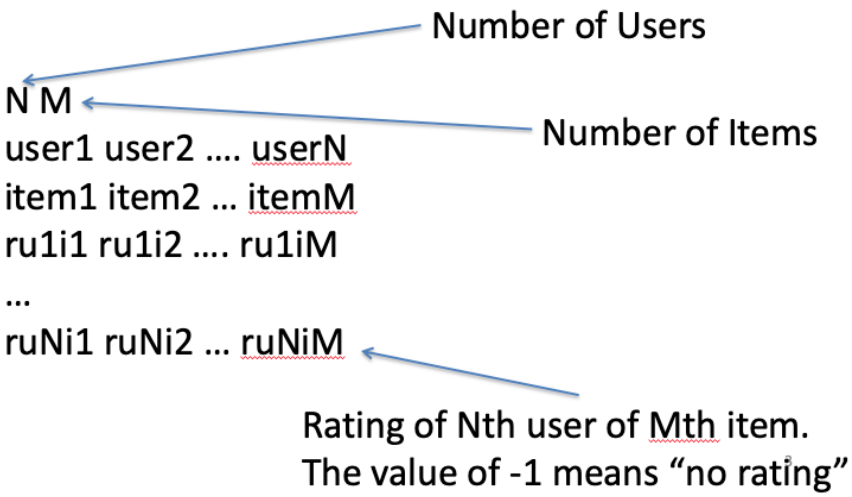
Demonstrating/Submitting

There will be two ways to receive credit for this lab, outlined below:
1. Attend an in-person lab or online office hours and demonstrate your completed lab before the deadline. You will have to show that the goals of the lab have been completed and answer some questions about the lab and your code (see the lab reflection questions for some examples). Your grade will depend on the level of completion, as well as the quality of your design and answers. Only one partner is required for demonstration, though both are encouraged to take part. If you demonstrate your lab this way, you don’t need to submit anything on Brightspace.
2. Record a video demonstration that is ~5-10 minutes long. Ensure that your discussion in the video makes it clear that you have understood the content that the lab covers and that you demonstrate all of the required functionality. Submit a ZIP containing a copy of your code (don't include database files, etc., and a copy of your demonstration video (either link to a public URL in your README or include the video file directly if it is <25MB) to Brightspace.

If you are working with a partner, only one of you should make a submission. Include a README indicating the names of both partners.

Lab Description

For this lab, you will be provided with a larger dataset (parsed-data-trimmed.txt) that follows a similar structure to the previously used ratings data. The full dataset will be used for the assignment. **The only change to the structure of this data from the past labs is that the value 0 is now used to indicate no rating instead of -1.**



The goal for this lab is to generate an output of the mean absolute error achieved by either the user-based or item-based recommendation algorithms that have been covered in the last few weeks. Whichever algorithm you decide to use, you should use a neighbourhood size of 5 for your calculation.

Now that we are working with data that is closer to what would be seen in a real-world application, we will have to deal with some unexpected outcomes in our calculations. For example, if the denominator in any of your calculations comes out to 0, you will get an output of NaN/-Infinity/Infinity. These should not be included as real predictions. Instead, a suitable "best guess" to make in any of these cases would be the average rating score of the user (remember to compute it by ignoring the current rating that we are predicting). You may also run into problems where you want to use a neighbourhood of size X but there are not X suitable neighbours to use. In these cases, you should use as many neighbours as possible (up to a maximum of X).

For your demonstration, you should discuss how you have implemented the 'leave one out' strategy, how you have computed your predictions, and how you have computed the mean absolute error over all of your predicted ratings. It should be possible to achieve a MAE of ~0.77 using 5 neighbours and either the user-based or item-based recommendation algorithm.

This lab should give you a rough idea of how long your experiments for assignment #2 will take to run. If you optimize your calculations to minimize computation, it should be possible to run the experiments in ~1 minute. If your runtime is very long, it would be worth discussing/investigating how to minimize the computations involved in updating the data for the leave-one out approach.