Assignment 11

The notebook in HuskyCT demonstrates Neural Collaborative Filtering using the MovieLens dataset (see the Neural Collaborative Filtering paper attached in HuskyCT). You will modify it for the assignment.

1. (2 points) Train the model with more epochs and set the early stopping condition so it is not overfitting. What do you observe in the training history graph (e.g. does the validation loss continue to go down compared to the current value of epochs=5)?
2. (3 points) Change batch_size to other values (32, 128, and 256). Which gives the lowest loss? The notebook should show all the results.
3. (3 points) Use the batch_size value that gives the lowest loss. Change EMBEDDING_SIZE to other values (100, 150, and 200). Which gives the lowest loss? The notebook should show all the results.
4. (2 points) Provide the top 10 movies for each user and save in a Excel file with the following columns user id, movie title, and movie genre.

Note that (2) and (3) do not require to run a grid search on both hyperparameters.

BONUS (2 points): Based on Autoencoder notebook (part 1) in Week 9, implement the Autoencoder based recommender system (AutoRec – see the related paper in the extra reading section) using MovieLens data. Note that the Autoencoder class in this case would need to be modified (e.g. there is no flatten or reshape).

Submission includes a Word document and the notebook in a zip file. Also include the html version.