Machine Learning Notes

N. Trong

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Note 1. Refer to assignment PDF's.

1 Ex 8. Anomaly Detection and Recommender Systems

1.1 Collaborative Filtering Learning Algorithm

Let n_m be the number of movies, n_u be the number of users. Given rating matrix Y and a number n, we want to find a feature matrix X of size $n_m \times n$ and parameter matrix Θ of size $n_u \times n$, where the i-th row of X represents the feature vector for the i-th movie, and the j-th row of Θ represents the parameter vector for the j-th user. In this context, n represents the number of hidden dimensions of a movie, e.g. x^i_k could refer to say how much action movie i has, x^i_l could refer to how much romance it has, and so on. Similarly, θ^j_k would refer to how much user j likes action, θ^j_l how much they like romance.

Note 2. These are only example names for the features, since in fact we don't know what features the algorithm will pick up given rating matrix Y. The features learned might have nothing to do with common movie genres, for example.

Question 3. *Can we cross validate to choose the best value n for the number of hidden features?*

Keywords. TODO