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Item-Based Collaborative Filtering of Movies Based on Mutual Information

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Abstract: Recommender systems have found major applications in e-commerce websites. Recommender systems filter useful information from a large pool of data, then suggest products to the consumer, which ultimately helps them make their choice. These systems are extensively used by e-commerce giants such as Amazon and Netflix to suggest what products the consumer can purchase, or what movies they can watch, respectively. Collaborative filtering is the most commonly and effective used method for recommender systems. In this study, the extent of similarity in collaborative filtering was found by computing mutual information within the items of a filtered dataset. Due to the non-linearity of the data, mutual information was used over traditional methods such as the Pearson correlation coefficient. The analysis was performed on three datasets obtained from the "MovieLens" database. The first dataset contains 100,000 ratings (9,000 movies rated by 700 users). The second dataset contains one million ratings (4000 movies rated by 6000 users). And the third dataset contains ten million ratings (10,000 movies rated by 72,000 users). Using these datasets, this study presents item-based movie recommender systems using mutual information of user ratings. The results showed promise; the recommender system was able to recommend movies that had the same theme and genre through mutual information collaborative filtering.

Keywords: Recommender Systems, Mutual Information, Collaborative Filtering, Item-Based, Movie Recommendations