

Movie Preferences Markov Model

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1 Real-World Phenomenon

Recommendations and preferences in technology services are very important to companies and people, as it can help companies build profiles and help people find their favorites. Many services like Netflix, Youtube, and Amazon Prime Video depend on their recommendation systems to engage their customers. Personalizing a user's preferences on movies can help movie theaters and advertisements to be more focused. Using genres and movie ratings in a recommendation chain program can provide users with similar movies, based on what they have watched. Movies that are similar would usually have similar genres and they would have different ratings. Using a combination of these aspects would allow program to recommend based on what movies would the user over another movie.

2 Derivation and Assumptions

2.1 Derivation

The Markov model was derived by finding characteristics of movies that can be used to recommend the user more movies. The initial state would be a weighted average combination of the ratings and genres of the user's moves that have been watched. The transition matrix would include the quantitative data values of genres of movies, using their IDs from the data source. This matrix would have what genres exist from movie to movie, so when executing the model, then the preference would be made using the user's genres to the movie data genres.

2.2 Assumptions

Assumptions need to be made in order to simplify the created recommendation system. Only what the user inputs or the initial states would be considered, so outside recommendations will not be considered. This makes the system less complex and easier to track the user's preferences. Another assumption would be that there will be only two characteristics that the preferences will be based. The movie dataset will only include ratings and genres to simplify. Also, the

assumption will be made that well-known and popular movies will be considered as a recommendation, so this may exclude foreign movies.

3 Data and Parameters

Data of movies, ratings, and genres will be taken from GroupLens. Data will be put in a .csv file and changed to only include needed parts. Parameters for the initial state of a combination of genre and rating for the user's movies.