## Building a Movie Rating Recommendation System

## Problem Statement

The main problem of entertainment platform is user retention. You can promote the platform for some time and attract a lot of users. But retaining them is more important since cost of retaining an existing customer is more than cost of getting a new customer.

Recommender systems are an important class of machine learning algorithms that offer "relevant" suggestions to users. They can be categorized as either collaborative filtering or a content-based system.

#### Collaborative Filtering Systems

Collaborative filtering methods for recommender systems are methods that are solely based on the past interactions between users and the target movies. Thus, the input to a collaborative filtering system will be all historical data of user interactions with target movies. This data is typically stored in a matrix where the rows are the users, and the columns are the movies.

The core idea behind such systems is that the historical data of the users should be enough to make a prediction. I.e. we don’t need anything more than that historical data, no extra push from the user, no presently trending information, etc.

#### Content Based Filtering Systems

Content here refers to the content or attributes of the products you like. So, the idea in content-based filtering is to tag products using certain keywords, understand what the user likes, look up those keywords in the database and recommend different products with the same attributes.

We need to build a Collaborative Filtering Systems based Recommender Systems that will predict the rating of a movie to the user based on the history of ratings of the user

Suppose a user logs into an entertainment platform and wants to watch a movie, system need to suggest the movie rating based on the ratings the user has provided for other movies before and what rating other users who have watched similar movies have given to the current movie. The business reasons to do this are many. Few of the reasons are:

1. Relevancy - The rating for the movie must be relevant for the user, i.e. based on the user's past ratings and thereby interests, if the user has rated horror movies highly and romantic movies poorly in the past, then a similar relation must exist here also.
2. Retaining the customers - The entertainment platform must put in its best efforts to retain its customers. For example, if a user watches a movie rated highly and if the movie is indeed relevant to the user, the user may come back to the platform to watch more content.

## Project Design Methodology

Rating recommendation model for movielens users using Singular value decomposition. I used techniques like Data Transformation, Missing Values Treatment, Exploratory data analysis, Machine learning algorithm SVD, Hyperparameter tuning and evaluation of model .

## Final Products to be completed

1. Project Presentation
2. Project Report
3. Project code in the form of jupyter notebook.