# MovieLens Recommendation System Presentation

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# Overview.

This project uses the MovieLens dataset, a popular dataset for recommendation systems, to analyze user ratings and preferences. However, the dataset faces challenges such as sparsity and cold start problems. To address this, collaborative filtering and content-based filtering techniques are proposed. The goal is to create a comprehensive recommendation system that provides personalized movie suggestions based on user ratings and preferences, with real-time feedback to continually improve the accuracy and relevance of recommendations.

# Problem Statement.

We have been tasked to develop a personalized movie recommendation system that maximizes user satisfaction and engagement,  taking into account their ratings on other movies. The goal is to increase user satisfaction,encourage longer engagement on the platform and potentially increase revenue through improved user retention and targeted content promotion.

# Project Objectives.

The MAIN objective is to build a model that provides top 5 recommendations to a user, based on their ratings on other movies.

The specific objectives are;

1. To implement a collaborative filtering algorithm.
2. To integrate content-based filtering techniques.
3. To evaluate the model's performance using RMSE and MAE.

# Data Description.

Data source: Movie Lens dataset by Group Lens Research Lab

Dataset composition: 100836 ratings across 9742 movies

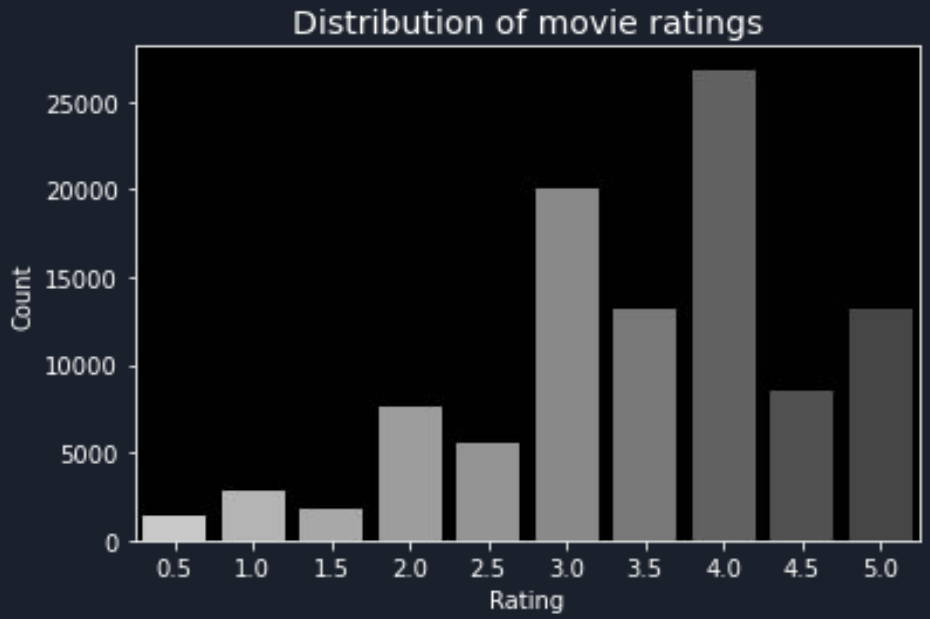
Data collected from 610 users

# The Process.

- Data preparation; includes shape and info of the dataset.
- Exploratory data analysis.
- Building a hybrid recommendation system

Combining collaborative and content-based filtering for better recommendations while addressing challenges like sparsity and cold start problem.

# Findings.




Majority of the movies have a high rating of 4.0

After using boxplots for the numerical columns in ratings dataset, the analysis indicates the absence of significant outliers.

We implemented a widget that upon entering a movie title, generates a list of 5 movies based on ratings on similar films.

# Conclusion.

Implementation of a hybrid  system avoids the shortcomings of  either collaborative and content-based filtering system while achieving accuracy, diversity and novelty from the generated recommendations.

The effectiveness of the subject system leads to enhanced user experience and higher platform engagement.

# Recommendations.

1. Ongoing Optimization
2. Ensure Regular Updating
3. Analyze User Feedback Integration
4. Explore Advanced Techniques
5. Enhance Diversity and Novelty

# Future Work.

1. Implement adaptive learning and dynamic parameter tuning to refine recommendation algorithms based on real-time user feedback and evolving data patterns.
2. Integrate real-time data processing for instant model updates and establish version control to manage and stabilize recommendations.
3. User Feedback Integration: Create robust feedback loops and use sentiment analysis to systematically incorporate user interactions and refine recommendations.
4. Explore Advanced Techniques: Investigate deep learning, reinforcement learning, and hybrid models to enhance recommendation accuracy and personalization.
5. Enhance Diversity and Novelty: Track diversity metrics, balance exploration and exploitation, and use novelty algorithms to keep recommendations fresh and engaging.

# THANK YOU!