An ML model To recommend movies based on the cluster of people present at a mall or gathering

**Introduction**

In today's digital age, the entertainment industry has evolved significantly, with movies being a popular choice for leisure. People often gather at malls or events in groups, where choosing a movie that suits everyone's preferences can be a daunting task. This project aims to alleviate this challenge by employing Machine Learning techniques to recommend movies based on the collective preferences of clusters of individuals present in such gatherings.

A **movie recommendation system** is a fancy way to describe a process that tries to predict your preferred items based on your or people similar to you. In layman’s terms, we can say that a Recommendation System is a tool designed to predict/filter the items as per the user’s behavior.

**Abstract**

**Personalization** is the way to match the right types of services, products, or content to the right users to help improve user engagement. By utilizing ML algorithms and data, it is possible to create smart models that can precisely predict customer intent and as such provide quality one-to-one recommendations. At the same time, the continuous growth of available data has led to information overload — when too many choices complicate decision-making. Primarily developed to help users deal with the large range of choices they encounter, recommender systems come into play.

**Recommender systems / recommender engines** are information filtering systems that provide individual recommendations in real-time. As powerful personalization tools, recommendation systems leverage machine learning algorithms and techniques to give the most relevant suggestions to particular users by learning data (e.g., past behaviors) and predicting current interests and preferences.

This report presents a Machine Learning project aimed at developing a movie recommendation system tailored for clusters of people gathered at malls or events. The system utilizes clustering techniques to group individuals with similar movie preferences and suggests movies that cater to the tastes of each specific cluster. This project addresses the challenge of providing personalized movie recommendations to diverse groups of people in a social setting, enhancing the overall entertainment experience.

**Methodology:**

1. **Genre-Based Clustering**: Movies are grouped into clusters using *K-Means* based on the genre preferences of the user.

2. **Cluster-Specific Recommendations**: Within each cluster, movie recommendations are generated based on ratings and relevance.

3. Use of **PCA** (Principal Component Analysis) to reduce the dimensionality of the data to 2D for visualization of clusters.

4. **Cluster Similarity**: You assess how similar or different clusters are from each other.

5. **Recommendation Delivery**: Users are given movie recommendations based on their cluster.

6. **Feedback and Refinement**: Continuously gather user feedback (update the dataset) and refine the recommendations for a better user experience.

**Reference:**

<https://www.javatpoint.com/k-means-clustering-algorithm-in-machine-learning>

<https://www.geeksforgeeks.org/principal-component-analysis-pca/>

**Code & Output:**

[**https://colab.research.google.com/drive/1y4sPcDIlGSEiaYejNd-9M2q8ALpxuxJs?authuser=1#scrollTo=ZTKyv7JIR5n5**](https://colab.research.google.com/drive/1y4sPcDIlGSEiaYejNd-9M2q8ALpxuxJs?authuser=1#scrollTo=ZTKyv7JIR5n5)