Abstract: *'Moviefy'* - Movie Recommender System

Objective: The primary goal of this project, *"Movie Recommender Systems,"* was to design and implement a system capable of providing personalized movie recommendations to users. The project aimed to address the challenge of creating accurate and efficient recommendation systems using machine learning techniques, with a focus on improving user engagement and satisfaction.

Methods: To achieve the stated objectives, the project leveraged the following approaches:

- **Machine Learning Techniques**: Algorithms such as k-Nearest Neighbors (kNN) and Latent Factor Models were implemented for collaborative filtering.
- **Content-Based Filtering**: Metadata, including movie genres and user-specific tags, was analyzed to align recommendations with user preferences.
- **Hybrid Techniques**: A combination of collaborative and content-based methods was employed to mitigate common challenges such as data sparsity and the cold start problem.
- **Tools & Tech:**:
    - **Python**: Used for implementing machine learning algorithms and data processing.
    - **MovieLens Dataset**: Consisting of over 100,000 movie ratings and metadata for approximately 9,000 movies, used as the primary data source.

Results: The project successfully demonstrated the following:

- Accurate movie recommendations tailored to user preferences.
- Improved system performance through the optimization of algorithms and evaluation metrics, such as Mean Absolute Error (MAE) and Root Mean Square Error (RMSE).
- A reduction in common recommendation system limitations by combining multiple techniques.

Contributions: This project highlights my ability to independently solve a scientific research problem by:

- Designing and testing machine learning models.
- Optimizing recommendation outputs through iterative improvements.
- Employing systematic approaches to evaluate and enhance model accuracy.

Summary:

The *"Movie Recommender Systems"* project showcases a robust application of machine learning and recommendation algorithms in addressing a real-world problem. It demonstrates technical proficiency and the ability to independently solve scientific challenges, paving the way for further advancements in personalized recommendation systems.