**MOVIE RECOMMENDATION SYSTEM : NETFLIX**

**Project Synopsis**

**MINI PROJECT**

**BACHELOR OF COMPUTER APPLICATION**

**BCA001**

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**FACULTY OF ENGINEERING & COMPUTING SCIENCES**

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Table of Contents

[1 Project Title 3](#_Toc31139962)

[2 Domain 3](#_Toc31139963)

[3 Problem Statement 3](#_Toc31139964)

[4 Project Description 3](#_Toc31139965)

[4.1 Scope of the Work 3](#_Toc31139966)

[4.2 Project Modules 3](#_Toc31139967)

[5 Implementation Methodology 3](#_Toc31139968)

[6 Technologies to be used 4](#_Toc31139969)

[6.1 Software Platform 4](#_Toc31139970)

[6.2 Hardware Platform 4](#_Toc31139971)

[6.3 Tools 4](#_Toc31139972)

[7 Advantages of this Project 4](#_Toc31139973)

[8 Future Scope and further enhancement of the Project 4](#_Toc31139974)

[9 Team Details 4](#_Toc31139975)

[10 Conclusion 5](#_Toc31139976)

[11 References 5](#_Toc31139977)

# Project Title

*Movie Recommendation System : NETFLIX*

# Domain

*Data Science Using Python & Machine Learning Algorithms*

# Problem Statement

The rapid growth of online streaming platforms has led to an overwhelming number of movies available to viewers. This abundance can make it difficult for users to discover new content that aligns with their preferences. Consequently, there is a need for a robust and efficient movie recommendation system to help users navigate this vast library and find movies they are likely to enjoy.

The primary goal of this project is to develop a movie recommendation system that can accurately predict user preferences and provide personalized recommendations.

# Project Description

The Movie Recommendation System is a machine learning-based application that provides personalized movie recommendations to users. It utilizes collaborative filtering techniques to analyze user preferences and similarities among movies to generate accurate and relevant recommendations. The system is built using Python programming language and incorporates popular machine learning libraries such as Scikit-learn, NumPy and Pandas.

Recommend movies that are highly likely to be enjoyed by specific users based on their preferences and historical viewing behavior.

## Scope of the Work

The scope of the this recommender system project outlines the tasks and features that will be included as well as those that are beyond the scope of this project.

What Will Be Done (In-Scope)

1. Data Collection and Preprocessing: Gathering datasets from KAGGLE containing user ratings, book metadata (e.g., title, genre, released year, language), and user reviews. Data cleaning, handling missing values, and preparing the data for analysis and model training.

2. Recommendation Algorithms: Implementing Collaborative Filtering (both user-based and item-based). Implementing Popular-Based Filtering by analyzing movie features like genre, title, and keywords. Exploring Hybrid Recommendation Systems, combining both collaborative and content-based approaches to improve recommendations.

3. Model Training and Evaluation: Training machine learning models using datasets. Evaluating models using metrics like Precision, Recall, and Mean Squared Error (MSE). Optimizing the recommendation algorithms for accuracy and efficiency.

5. Integration with External APIs: The project will uses static datasets and is also integrated with external APIs for real-time movies images which is extracted from TMDB(The Movies Database) API in order to display them as per their title.

5. Scalability and Performance: Ensuring the system can handle large datasets with many users and books. Using efficient algorithms and techniques to scale the system for real-world applications.

What Will Not Be Done (Out-of-Scope)

1. Advanced Natural Language Processing (NLP): While simple text analysis may be used for content-based filtering (e.g., keyword matching), advanced NLP techniques like sentiment analysis of reviews or sophisticated text embeddings will not be implemented.

2. Real-Time User Behavior Tracking*: The system will use static data (historical user behavior) for making* recommendations. Real-time tracking of user actions and dynamic updates to recommendations will not be part of the initial scope.

3. Deployment: The system will be built and tested in a local or development environment. Full deployment on a live server or integration with real-world platforms (e.g., e-commerce websites) is not in scope for this project.

4. Complex User Interface and Front-End Design: A minimal, functional interface will be provided if necessary. However, advanced user interface design, mobile compatibility, or detailed user interaction features will not be developed.

6. Multi-Language Support: The system will focus on English-language books and users. Adding support for multiple languages (both in recommendations and user interface) will not be addressed. By clearly defining the boundaries, this scope ensures that the project remains focused on building an effective and functional recommendation system, while more advanced or peripheral features are reserved for future iterations or separate projects*.*

## Project Modules

Image Carousel :

Displays some movies posters to give you an overview and makes you familiar with the interface and the movies category.

Dropdown Menu:

Gives you a list of all the movies available to select and search for your next recommended movie based on the search results.

Recommendedation:

Recommends user 4 movies as a search engine result with movie title, poster and genre.

**Additional Considerations:**

* **Rating:** Consider adding a rating system where users can rate movies. This can be used to improve recommendation accuracy.
* **Review:** Allow users to write reviews for movies. This can provide valuable feedback for other users.
* **Tagging:** Implement a tagging system where users can tag movies with keywords. This can help in finding similar movies.
* **Social Features:** Consider adding social features like friend lists and following, allowing users to discover movies recommended by their friends.

# Implementation Methodology

**DATA FLOW DIAGRAM**

Movie Recommendation System

User Search

Search for a Movie from menu

Search Data according to indexes in dataets

API request

User Movie Query

View movie top 5 movie recommendations

The Movie Database

(TMDB)

Movie Description and genre

API Request

View Movie Details

View Movie Recommendations

**FLOW DIAGRAM**

Datasets

Performing EDA

Data Cleaning

Feature Selection

Cosine Similarity

API Request

Training

Recommendations

**ER DIAGRAM**

**Entities:**

* **Movie:** movieID, title, year, genre, director, actors, plot, rating, reviews
* **Recommendation:** recommendationID, userID, movieID, score (strength of recommendation)

**Relationships:**

* **User-Movie:** Many-to-many relationship. A user can watch many movies, and a movie can be watched by many users.
* **Movie-Recommendation:** One-to-many relationship. A movie can have many recommendations, but a recommendation belongs to only one movie.

**Attributes:**

* **Movie:** movieID, title, year, genre, director, actors, plot, rating, reviews
* **Recommendation:** recommendationID, userID, movieID, score (strength of recommendation)

# Technologies to be used

## Software Platform

1. **Front-end -** Streamlit and Node.js
2. **Back-end -**  Pyhton : Pandas, NumPy, Scikit-learn, Pickle

## Hardware Platform

Processor Intel(R) Core(TM) i5-10300H CPU @ 2.50GHz 2.50 GHz

RAM 8.00 GB

System type 64-bit operating system, x64-based processor

## Tools

Jupyter Notebook, PyCharm

# Advantages of this Project

· Users can quickly discover new movies they might enjoy without having to spend hours browsing through catalogs.

· Recommenders can introduce users to movies they might not have considered otherwise, expanding their horizons.

· A well-designed recommender system can enhance the overall user experience by making it easier to find and enjoy movies.

Movies are recommended based on the cosine similarity of the overview.

# Future Scope and further enhancement of the Project

1. Advanced Personalization: Incorporate deep learning models like neural collaborative filtering for more accurate, context-aware recommendations. Use natural language processing (NLP) to analyze user reviews andmovie content, improving recommendation relevance.

2. Multi-Modal Recommendations: Extend recommendations to include multiple language movies, web series, or tv shows, offering a broader content variety.

3. Real-Time Recommendations: Implement real-time recommendation updates based on user behavior during browsing sessions for improved engagement.

4. Cross-Platform Integration: Integrate with social media platforms, allowing users to share and receive recommendations from friends or influencers.

5. Collaborative Filtering with Demographics: Incorporate demographic information to create more tailored recommendations for users with similar backgrounds.

6. Improved User Interface: Enhance the user interface with AI-driven chatbots that can interactively suggest movie based on real-time conversations.

7. Explainable AI: Introduce explainable AI to help users understand why specific movie are recommended, increasing trust and transparency.

8. Global Expansion: Support for multiple languages and cultural contexts to expand the recommendation system to international users.

These future enhancements can make the system more intelligent, user-friendly, and globally accessible, enhancing its overall value and scalability.

# Team Details

| **Project Name & ID** | **Course Name** | **Student ID** | **Student Name** | **Role** | **Signature** |
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| Movie Recommendation System : Netflix | BCA | TCA2201257 | Ishika Sharma | Developer |  |
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# Conclusion

The Movie Recommendation System demonstrates a successful application of machine learning techniques to deliver personalized movie suggestions tailored to individual user preferences. By employing collaborative filtering and hybrid recommendation strategies, the system effectively analyzes user behavior and movie characteristics, resulting in accurate and relevant recommendations.

Moving forward, there are opportunities for further enhancement, including the exploration of advanced machine learning techniques and the incorporation of user feedback for continuous improvement. Overall, this project not only contributes to the growing field of recommendation systems but also enriches the viewing experience for users, encouraging them to discover new films tailored to their tastes.