

Problem Statement

The goal of this project is to develop a recommendation system that suggests items from different domains based on the users preferences in one or more domains. The system aims to provide personalized recommendations to users in order to enhance their experience and help them to discover new items across various domains.

Context

In today's digital age users have access to a multitude of content across different domains. However, finding relevant items that align with their interests can be challenging and time-consuming. By using user preferences and interactions within specific domains we aim to develop a cross-domain recommendation system that can assist users in discovering new items they may enjoy, ultimately improving user satisfaction and engagement.

Criteria for Success

The success of the cross-domain recommendation system will be evaluated based on:

- **Relevance:** The recommended items should be relevant to the user's preferences and interests
- **Diversity:** The recommendations should span across different domains, providing a diverse set of suggestions
- **User Satisfaction:** The system should enhance the user's experience by helping them to discover new items they might enjoy.

Scope of Solution Space

The solution will focus on developing a recommendation system that utilizes user interactions from different domains (e.g. movies, books, and music) to leverage and explore content based approaches to generate personalized recommendations.

Constraints

The quality of the datasets provided may have limitations in terms of quality and completeness. The recommendations will be based on historical user preferences and may not capture any real-time changes in user interest.

Stakeholders

Individual end-users who might benefit from personalized recommendations across different domains are the primary stakeholders. Companies or platforms that offer movies, books, and music could integrate the recommendation system in order to enhance user engagement.

Data Sources

The following datasets will be used for building the system:

- 1.) Book Recommendation Dataset:
<https://www.kaggle.com/datasets/arashnic/book-recommendation-dataset?select=Users.csv>
- 2.) Movie Recommendation Dataset:
<https://www.kaggle.com/datasets/ranitsarkar01/movies-recommender-system-dataset?select=ml-1m>
- 3.) Music Recommendation Dataset:
<https://zenodo.org/records/6090214>

Methodology

- 1.) Clean and preprocess the datasets, deal with missing values, and perform EDA to gain starting insights on user preferences and characteristics.
- 2.) Extract relevant features from the datasets and create user-item interaction matrices for each domain.
- 3.) Start with collaborative filtering methods such as matrix factorization or neighborhood based methods to build the recommendation system.
- 4.) Evaluate model performance using metrics such as precision, and recall.
- 5.) Identify possible strategies to generate recommendations across different domains based on user preference and item similarities.