**Recommender Systems**

**Book-Crossing Dataset using Item Based Collaborative Filtering**

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**Introduction**

This project explores the application of item-based collaborative filtering, a significant technique in recommender systems, using the Book-Crossing dataset. Unlike user-based collaborative filtering, which relies on similarities between users, item-based collaborative filtering recommends items based on their similarity to items a user has previously liked or interacted with.

**About Dataset**

The Book-Crossing dataset's comprehensive nature allows for detailed analysis of reading patterns and preferences, making it an ideal choice for this project on item-based collaborative filtering. The dataset's real-world grounding ensures that insights gained from this analysis have practical relevance and applicability.

**Methodology**

In this project, the methodology centers around applying item-based collaborative filtering to the Book-Crossing dataset, with a specific focus on cosine similarity for calculating item similarities. Initially, the dataset undergoes data preprocessing to ensure data quality and consistency. Following this, cosine similarity is used to determine the likeness between different books based on user ratings, forming the crux of our recommendation model. This model then recommends books to users by identifying those most similar to what they have previously rated highly. The effectiveness of this model is assessed using precision, recall, and mean squared error, to ensure the recommendations are accurate and relevant to the user's preferences.

**Conclusion**

The project's implementation of item-based collaborative filtering on the Book-Crossing dataset highlights its significant advantages: scalability, effectiveness in sparse data environments, and stability in item relationships. These strengths, particularly observed in the context of using cosine similarity for item comparison, underscore item-based collaborative filtering's potential in enhancing the accuracy and relevance of recommendations in large-scale recommender systems.