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PRODUCT RECOMMENDATION SYSTEM

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ABSTRACT
In our daily lives, e-commerce websites are integral for shopping, presenting a challenge for retail stores to meet diverse consumer demands. To address this, recommender systems are employed to enhance the shopping experience by suggesting products tailored to individual preferences. In this project, we utilized user ratings to recommend products. Initially, we constructed a matrix to represent product ratings by different users. Subsequently, we developed user and item profiles to offer recommendations based on similarity to other groups. We employed the KNN algorithm and Pearson's Correlation Coefficient for recommendation generation. The model's performance was evaluated using RMSE to assess the accuracy of recommendations.

Keywords:
E-commerce, recommendation systems, user ratings, matrix representation, KNN algorithm, Pearson's Correlation Coefficient, product recommendations, user profile, item profile, RMSE evaluation

INTRODUCTION

E-commerce relies on recommendation systems to meet diverse consumer demands, enhancing the shopping experience. Our project utilizes user ratings to recommend products, employing techniques like KNN algorithm and Pearson's Correlation Coefficient. Evaluation is based on RMSE, ensuring recommendation accuracy.

OBJECTIVES

The objective is to enhance the e-commerce shopping experience by implementing a recommendation system based on user ratings. This system aims to provide personalized product recommendations to users, utilizing techniques such as the KNN algorithm and Pearson's Correlation Coefficient. Evaluation of the system's performance is conducted using RMSE to ensure the accuracy of recommendations.

CLAIMS

Claim 1: This system provides accurate product recommendations.
Claim 2: It features a user-friendly interface, ensuring easy accessibility to the system.
Claim 3: The system efficiently manages large volumes of data by leveraging our algorithm, which utilizes previous datasets to identify newly searched products and offer relevant suggestions.
Claim 4: Our system employs a hybrid filtering algorithm to identify suitable products, thereby reducing time complexity.
Claim 5: Unlike previous recommendation systems that rely on trending or popular products, our approach focuses on providing more relevant suggestions to users.
Claim 6: Keeping Users Happy: By consistently providing relevant suggestions, the recommendation system aims to enhance user satisfaction, retention, and loyalty, refining recommendations with increased user engagement.

DETAILED DESCRIPTION OF INVENTION:

INTRODUCTION:

Recommendation systems are like helpful guides on websites, especially for online shopping. They suggest things you might like based on what you've looked at or bought before. This makes it easier for you to find what

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you want. These systems keep learning from what you do, making the suggestions better over time. These like your shopping buddies, making your experience more enjoyable and helping you discover new things.

CONTINUOUS IMPROVEMENT CYCLE:
The invention introduces a continuous cyclic process wherein user visits to the website contribute to the collection of valuable data about users and products. This data, in turn, facilitates the identification of areas for product improvement. The emphasis is placed on the correlation between product quality and user acquisition, highlighting the cyclical nature of the process.

SALES BOOST THROUGH PERSONALIZATION:
The recommendation systems ability to offer personalized suggestions is underscored, noting that this leads to increased user interest and subsequent purchases. For instance, if a user buys a monitor, the system suggests complementary items like keyboards and mice. This not only enhances the users shopping experience but also boosts sales of related items that users might not have actively searched for.

FILTERING TECHNIQUES:
The recommendation systems described in the invention are based on two primary filtering techniques:
1 Content-Based Filtering: This technique relies on item-item relationships, forming clustersor relationships between groups of items. When a user searches for one item from a cluster, relevant items from that cluster are displayed.
2 Collaborative Filtering: Based on user behavior, collaborative filtering forms clusters among different customers depending on their previous purchases and history. Similar products are then recommended to remaining users in the cluster.

CONCLUSION

The project aims to provide recommendations on an e-commerce platform using machine learning, particularly collaborative filtering and Pearson correlation coefficient. By analyzing ratings from other users on similar products, the system suggests items to the current user. Future improvements include enhancing system efficiency and catering to users without purchase history. We plan to explore recurrent neural networks and deep learning to address limitations of existing techniques, such as incorporating time in recommendations. Additionally, we aim to implement a feedback mechanism to refine recommendations based on user reactions for better personalization.

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