

Abstract

Recommendation engines work by collecting data about user behavior, such as what products they have viewed or purchased, what pages they have visited, and what articles they have read. They then use this data to build a model of each user's interests. In this research study product recommendation system is studied. To increase customer satisfaction and sales, product recommendation systems analyze customer behavior, purchasing patterns, and preferences to make recommendations for products of their interest. To study product recommendation systems, the Amazon dataset is used. The Amazon Product Dataset is a large collection of customer-submitted product reviews and ratings that is frequently used as a benchmark dataset in research on recommender systems and natural language processing.

Product recommendations were performed using five different models, including GNN-based, collaboration-based, popularity-based, content-based, and content-based systems. For machine learning models, RMSE and MAE accuracy metrics were used, and for GNN models, AUC-ROC scores were used. Users can receive personalized product recommendations based on their past behavior and preferences using the GNN model, which has been found to be the most accurate and effective. After comparing the various models it was determined that the GNN-based recommendation system outperformed the other models in terms of accuracy and efficiency. This is so that more personalized and accurate product recommendations can be made. GNN models can take into account complex and non-linear relationships between users, products and other variables.

This study uses hybrid, GNN-based, collaboration-based, popularity-based, content-based and other recommendation systems to demonstrate the value of personalized product recommendations for users.

Objectives:

1. The primary goal of GNN-based recommendation systems is to enhance the user experience and boost engagement by providing personalized and relevant recommendations.
2. Utilizing other information related to the users or items to make recommendations.