

ABSTRAK

Perkembangan *e-commerce* menyebabkan jumlah produk fashion, khususnya sepatu, semakin beragam sehingga pengguna sering mengalami kesulitan dalam memilih produk yang sesuai dengan kebutuhan dan preferensinya. Sistem rekomendasi menjadi salah satu solusi untuk membantu pengguna memperoleh rekomendasi produk yang relevan. Penelitian ini bertujuan mengimplementasikan serta membandingkan metode *content-based filtering* dan *constraint-based filtering* dalam sistem rekomendasi sepatu berbasis atribut. Dataset yang digunakan berasal dari *fashion product images (kaggle)*, kemudian dilakukan proses *pre-processing* yang meliputi seleksi data, seleksi atribut, pembersihan data, normalisasi teks, dan pembentukan fitur gabungan menggunakan atribut gender, *basecolour*, season, dan *usage*. Pada metode *content-based filtering*, representasi fitur dibentuk menggunakan TF-IDF dan dihitung tingkat kemiripannya menggunakan *cosine similarity*, sedangkan metode *constraint-based filtering* menerapkan pendekatan *soft constraint* berbobot berdasarkan kesesuaian atribut dengan preferensi pengguna. Evaluasi dilakukan menggunakan pendekatan Top-K *Recommendation* dengan metrik *precision* dan *recall*. Hasil penelitian menunjukkan bahwa kedua metode berhasil diimplementasikan dan menghasilkan performa yang setara. Pada Top-3 diperoleh nilai *Precision* sebesar 1,00 dan *recall* sebesar 0,30. Pada Top-5 diperoleh *precision* sebesar 1,00 dan *recall* sebesar 0,50, sedangkan pada Top-10 kedua metrik mencapai nilai 1,00. Meskipun memiliki performa evaluasi yang sama, *constraint-based filtering* dinilai lebih sesuai untuk sistem rekomendasi sepatu berbasis atribut karena mampu memanfaatkan preferensi pengguna secara eksplisit melalui pendekatan *soft constraint* berbobot pada data yang didominasi atribut kategorikal. Oleh karena itu, metode ini lebih tepat diterapkan pada sistem rekomendasi sepatu berbasis atribut tanpa memerlukan data interaksi pengguna.

Kata kunci: Sistem Rekomendasi, *Content-Based Filtering*, *Constraint-Based Filtering*, *TF-IDF*, *Cosine Similarity*.

ABSTRACT

the rapid growth of e-commerce has significantly increased the variety of fashion products, particularly shoes, making it more difficult for users to select products that match their needs and preferences. recommendation systems have become an effective solution for providing relevant product suggestions. this study aims to implement and compare the content-based filtering and constraint-based filtering methods in an attribute-based shoe recommendation system. the dataset used in this study was obtained from the fashion product images dataset available on kaggle. the data underwent several **pre-processing** stages, including data selection, attribute selection, data cleaning, text normalization, and feature combination using the attributes of gender, basecolour, season, and usage. in the content-based filtering method, product features were represented using the tf-idf weighting scheme and similarity was measured using cosine similarity. meanwhile, the constraint-based filtering method employed a weighted soft constraint approach based on the compatibility between product attributes and user preferences. system performance was evaluated using the top-k recommendation approach with precision and recall metrics. the experimental results indicate that both methods were successfully implemented and achieved comparable performance. at top-3, both methods obtained a precision of 1.00 and a recall of 0.30. at top-5, both methods achieved a precision of 1.00 and a recall of 0.50, while at top-10, both metrics reached 1.00. although both methods produced identical evaluation results, constraint-based filtering was found to be more suitable for attribute-based shoe recommendation systems because it explicitly incorporates user preferences through a weighted soft constraint approach on predominantly categorical data. therefore, this method is more appropriate for attribute-based shoe recommendation systems that do not rely on user interaction data.

Keywords: Recommendation System, Content-Based Filtering, Constraint-Based Filtering, TF-IDF, Cosine Similarity.



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