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Discovering Generalized Profile-Association Rules for the Targeted Advertising of New Products

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Abstract

We propose a data-mining approach for the targeted marketing of new products that have never been rated or purchased by customers. This approach uncovers associations between customer types and product genres that frequently occurred in previous transaction records. Customer types are defined in terms of demographic attribute values that can be aggregated through concept hierarchies; product types can be generalized through product taxonomies. We use generalized profile-association rules (GP association rules) to identify the advertising targets for a given new product. In addition, we propose two algorithms—GP-Apriori and Merge-prune—to mine GP association rules and develop a value-based targeted advertising algorithm to select prospective customers of a new product on the basis of the discovered rules. We evaluate the proposed approach using both synthetic data and library-circulation data.

Key words : Data mining; Profile-association rules; Generalized profile-association rules; Fractional 0–1 knapsack problem; Greedy algorithms; Targeted advertising; Recommender systems