A Framework for Evaluating Skyline Queries over Incomplete Data


Abstract

Research interest in skyline queries has significantly increased over the years, as skyline queries can be utilized in many contemporary applications, such as multi-objective decision-making systems, decision support systems, recommendation systems, data mining, and personalized systems. Skyline queries return data items that are not dominated by any other data items in all dimensions (attributes). Most of the existing skyline approaches assumed that database is complete and values are present during the skyline process. However, such assumption is not always to be true, particularly in a real world database where values of data item might not be available (missing) in one or more dimensions. Thus, the incompleteness of the data affects negatively an skyline process due to losing the transitivity property which leads into the issue of cyclic dominance. Therefore, applying skyline technique directly on an incomplete database is prohibited and might result into exhaustive pairwise comparison. This paper presents an approach that efficiently evaluates skyline queries in incomplete database. The approach aims at reducing the number of pairwise comparisons and shortens the searching space in identifying the skylines. Several experiments have been conducted to demonstrate that our approach outperforms the previous approach through producing a lower number of pairwise comparisons. Furthermore, the result also illustrates that our approach is scalable and efficient © 2016 The Authors.

Author keywords

Incomplete data, Preference queries, Query processing, Skyline, Skyline queries

Indexed keywords

Engineering controlled terms: Artificial intelligence; Database; Decision making; Decision support systems; Query languages; Ubiquitous computing; Incomplete data; Match criteria decision making; Pair-wise comparison; Preference queries; Real-world database; Research interests: Skyline; Skyline query

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References (18)