159. DATABASE THREAT ANALYSIS TOOL [DTAT] FOR TOP-K OBJECTS QUERIES

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Top-k pairs and top-k objects queries have received significant attention by the research community. In this paper, we present the first approach to answer a broad class of top-k pairs and top-k objects queries over sliding windows. Our framework handles multiple top-k queries and each query is allowed to use a different scoring function, a different value of k, and a different size of the sliding window. Furthermore, the framework allows the users to define arbitrarily complex scoring functions and supports out-oforder data streams. For all the queries that use the same scoring function, we need to maintain only one K-skyband. We present efficient techniques for the K-skyband maintenance and query answering. We conduct a detailed complexity analysis and show that the expected cost of our approach is reasonably close to the lower bound cost. For top-k pairs queries, we demonstrate the efficiency ofour approach by comparing it with a specially designed supreme algorithm that assumes the existence of an oracle and meets thelower bound cost. For top-k objects queries, our experimental results demonstrate the superiority of our algorithm over the state-of-theart

Keywords— Top-k pairs, top-k objects, sliding windows, data streams, top-k queries.

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