Cquirrel: Continuous Query Processing over Acyclic Relational Schemas

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1 Motivation & Goal

Motivation: In many emerging applications, queries are evaluated on a database that is being continuously updated. However, existing solutions do not have good support for multi-way join operators.

Goal: In this paper, we demonstrate Cquirrel, a continuous query processing engine built on top of Flink. It provides much better support for multi-way joins than the native join operator in Flink. Meanwhile, it offers better performance, scalability, and fault tolerance than other continuous query processing engines.

2 System Architecture

Cquirrel contains the following main components:
- Core: including execution and maintenance logic of Cquirrel, built on top of Flink DataStream API.
- Code generator: generating execution codes for a given SQL query.
- GUI: for query input, result display, and debug information display.

3 Maintenance Procedure

Basic Idea: Maintaining live state of each tuple in the database based on whether the tuple exists in subquery results.