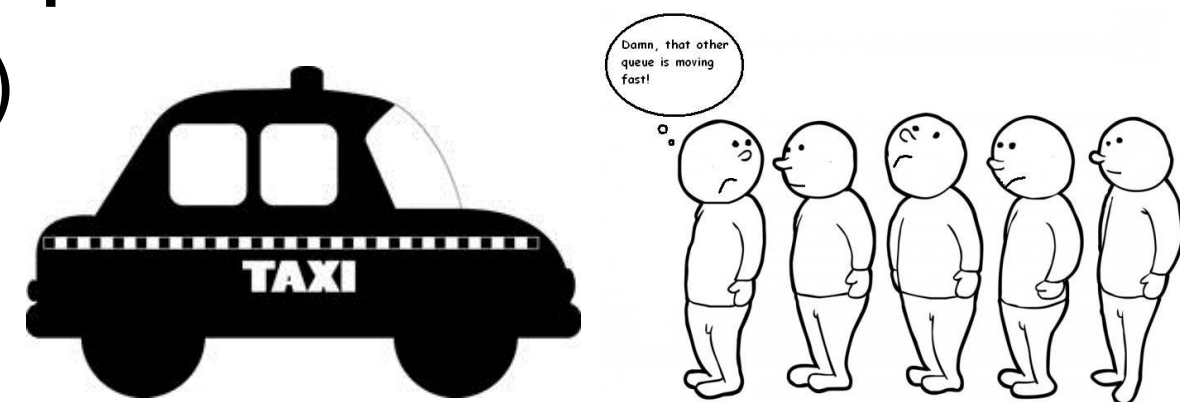


The Problem

- Applications invoke DB queries/Web Service requests
 - repeatedly (with different parameters)
 - synchronously (blocking on every request)
- Naive iterative execution of such queries: inefficient
 - No sharing of work (eg. Disk IO)
 - Network round-trip delays

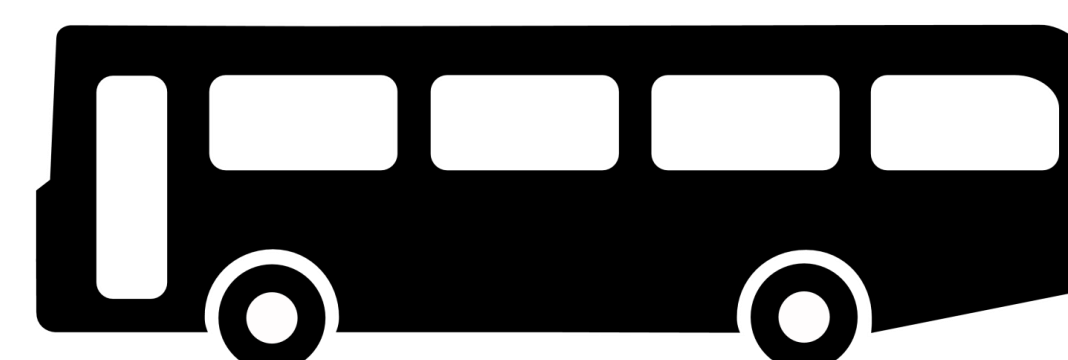


The Problem is **not within the database engine**
in the way queries are invoked from the application

Query optimization: time to think out of the !

Soln 1: Batching

- Repeated invocation of a query **automatically** replaced by a single invocation of its **batched form**
- Enables use of efficient set-oriented query execution plans



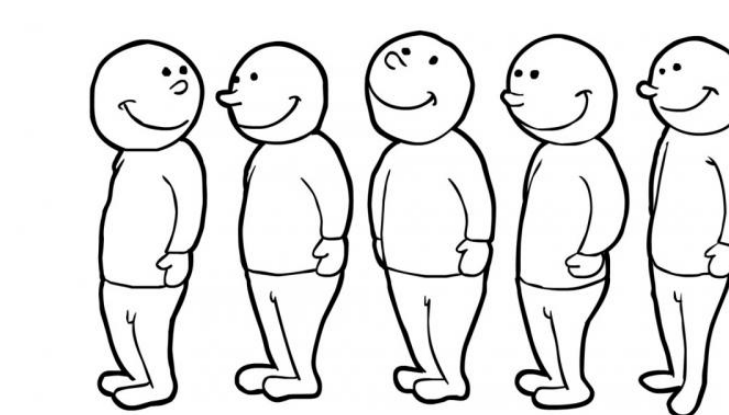
Soln 2: Asynchronous Submission

- Repeated synchronous invocation of queries **automatically** replaced by **asynchronous submission**
- Application can perform other work while query executes
- Multiple queries could be issued concurrently

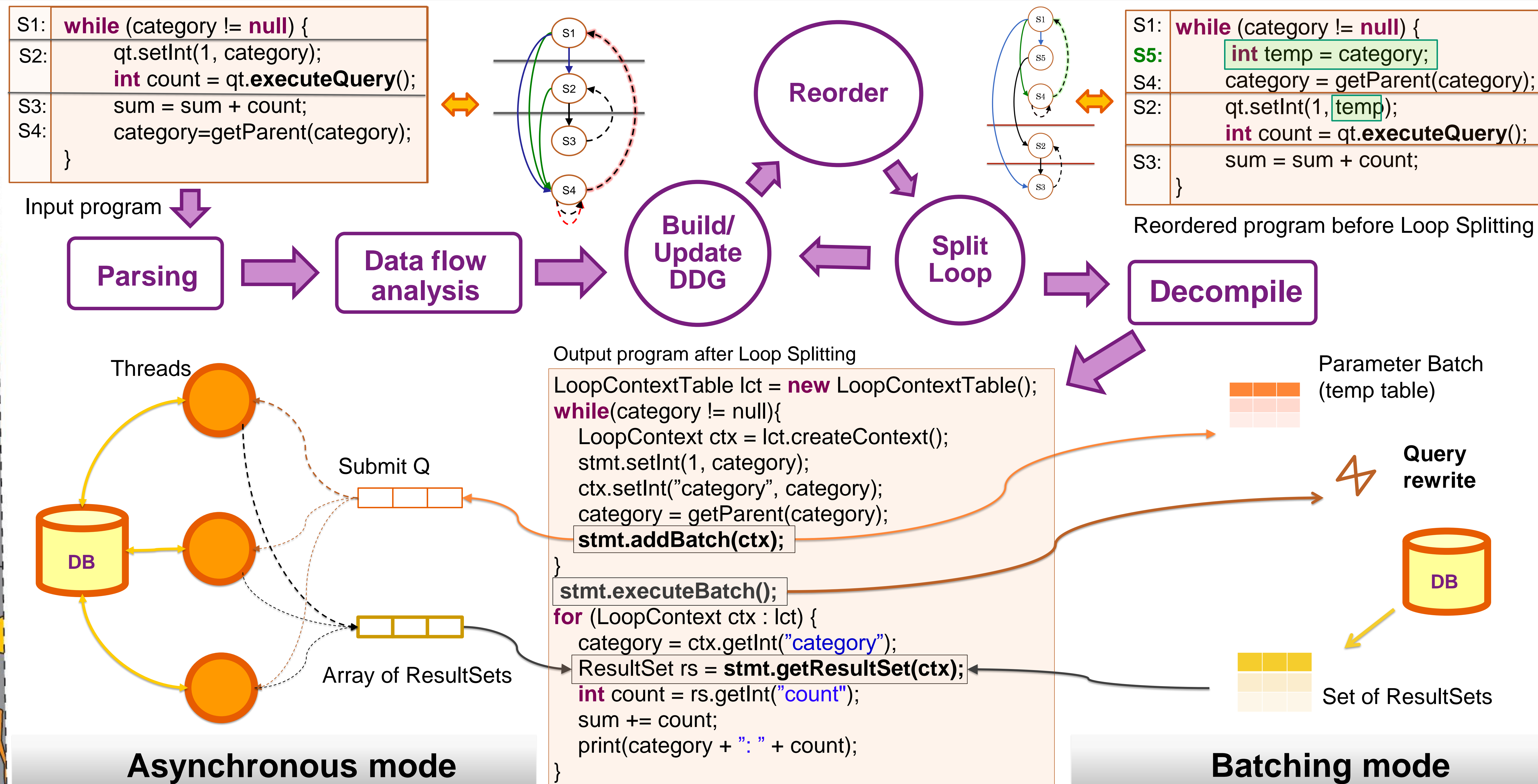


Approach

- Analyze application programs along with embedded queries
- Transform programs using equivalence rules and semantics preserving reordering
- Rewrite queries using decorrelation, APPLY operator, etc.
- **DBridge**: Implementation for Java/JDBC, using Soot framework (<http://www.cse.iitb.ac.in/dbms/dbridge>)



Program Transformation



Identical API for Batching and Asynchronous approach

Performance gains (upto 7x)!

