Title:
Optimization of Query Processing in an Embedded Database System

Motivations
An embedded database system is a software system, which is linked into a software application that requires access to persistent storage "formatted" as a traditional relational database. Architecture of an embedded database system is different from a typical standing alone relational database server. An embedded database system is a single user system and it is always a software component of other, larger software system. The application domains of embedded database systems are also different from the typical mainly business related domains of the conventional database systems. These applications include storage and management of persistent data in small electronic devices like mobile phones, personal organizers, micro controllers, nodes of senor networks, etc.

At the moment, a variety of embedded database systems is available on a market and in a public domain, e.g. Berkeley DB (recently acquired by Oracle), SQLite, eXtremeDB, Empress, Accuracer Mini SQL, HSQLDB, Infinity, embedded version of MySQL, and many others.

Due to the limitations on the available computing resources, in-memory implementation techniques, and real-time response constraints embedded database systems do not optimize query processing in the same way and to the same extent as the large conventional relational database systems.

Objectives
An objective of this project is to investigate the query processing techniques that can be applied in a typical embedded database system and to implement a new technique for optimization of query processing in such system. In particular, the project consists of the following tasks:

1. compilation and installation of an embedded database system SQLite,
2. analysis of query processing techniques implemented by the system and its performance "bottlenecks",
3. invention of new query optimization techniques that can improve performance of the system and,
4. a prototype implementation of the proposed solutions.