# System Architecture of View Updates

CLI

SQLite DB

Update View Controller

Parser

Query Processor

DB Connector

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Step 1: Command Line Interface parses SQL query by user to Update View Controller.

Step 2: View Update Controller sends the SQL query to the Parser.

Step 3: The parser analyses SQL query and captures the type of SQL query, i.e. insert, delete, update or create and checks for projection, restriction and join operation. It also interprets the SQL query restriction and represenst it as abstract syntax trees. In addition, it keeps track of physical databse table’s mapping with corresponding projected columns of the view. All these information will be saved and returned to View Update Controller.

Step 4: View Update Controller parses the information generated by Parser to Query Processor to determine if the query is updatable. Query Processor will check if the query fulfills the table predicate and restriction constraints.

Step 5: If SQL query does not violate any table predicate or restriction constraint, Query Processor will transform view updates into physical table updates by performing the necessary operations for view updates using DB Connector. If the SQL query does not fulfill the requirement, no operation will be performed. Query Processor will then notify View Update Controller the result of the operations.

Step 6: View Update Controller will notify Command Line Interface whether the operation is successful.

The system is made up of the following components:

**Command Line Interface**

Command Line Interface allows user to interact with the program through the use of a set of command namely: SQL standard query, help and exit to achieve view updates.

**Update View Controller**

Update View Controller acts as an interface between Command Line Interface and backend components. The controller calls the necessary component to perform the required operations specified by the user and returns the result to the user through the Command Line Interface. It also keeps track and manages the views that have been created in the session.

**Parser**

Parser analyses SQL query and decomposes the query into useful information. It determines the type of SQL query, i.e. insert, delete, update or create and checks for projection, restriction and join operation. It also interprets the SQL query and represents restriction as abstract syntax trees which can be use for further computation. In addition, it keeps track of physical databse table with corresponding projected columns of the view.

**Query Processor**

Query processor enforces view update rules and performs view updates. It perfoms check on SQL query and determines if it fulfills the table predicate and restriction constraints before updating the database. If SQL query does not violate any restriction constraint or table predicate, it will call DB connector to perform the necessary operations.

**DB Connector**

DB Connector communicates directly to the physical database and executes SQL queries. It also retrieves information from the physical database and returns the result to View Update Controller.