UDSQL Project Documentation

Development Team

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1 Introduction

The project **UDSQL** is a database management system with a command-line interface (CLI). This system allows users to interact with databases and perform common operations such as creating, inserting, querying, updating, deleting, and dropping databases and tables.

2 Objectives

The main objective of this project is to implement a simple and efficient system for managing databases using basic SQL commands through a CLI. The functionalities include database and table creation, data insertion and manipulation, and query execution.

3 Project Structure

The project is divided into the following modules:

- `dbms/database.py`: Contains the `Database` class that manages database-related operations such as creation and deletion.
- `dbms/parser.py`: The `Parser` class analyzes the commands entered by the user and converts them into an executable structure.
- `dbms/executor.py`: Contains the `Executor` class that executes the commands once parsed.
- `dbms/exceptions.py`: Defines custom exceptions, such as `DroppedDatabaseError`.
- `CLI.py`: The main file that manages user interaction through the CLI.

4 System Functionality

Below are the main functionalities supported by UDSQL:

4.1 SQL Commands

The system supports the following SQL commands:

- `CREATE DATABASE <database_name>`: Creates a new database.
- `CREATE TABLE <table_name> <column_name1> <data_type1> ... PRIMARY_KEY <primary_key>`: Creates a new table.
- `INSERT INTO <table_name> VALUES <value1> <value2> ...`: Inserts data into a table.
- `SELECT * FROM <table_name>`: Performs a select query on a table.
- `UPDATE <table_name> SET <column_name1> <value1> WHERE <condition>`: Updates values in a table.
- `DELETE FROM <table_name> WHERE <condition>`: Deletes records from a table.
- `DROP TABLE <table_name>`: Drops a table from the database.
- `DROP DATABASE <database_name>`: Drops a database.
- `EXIT`: Exits the system.

4.2 Parser and Command Execution

The `Parser` is responsible for analyzing the SQL commands provided by the user and converting them into structures that the system can execute. The commands are then executed by the `Executor`, which performs the data manipulation and file operations.

4.3 Exception Handling

The system includes custom exception handling. For example, when a user tries to access a database that has been dropped, a `DroppedDatabaseError` exception is raised.

5 Conclusions

The UDSQL system provides an efficient way to manage databases through a simple and functional CLI. Through this system, users can perform common database operations without the need to use complex tools.