

Daniela Castorena
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Dr. Zhao
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PA3 Design Document

Program's purpose

The purpose of this program is to expand the development of a Python-based database that functions like SQL. The initial version (PA1) included basic functions, such as creating and deleting both databases and tables, as well as querying and modifying table data. The second version (PA2) improved the ability to update and query table contents. This latest update now involves incorporating table joins.

How different joins were implemented at a very high level

In this updated version, two types of table joins were added: inner and left outer joins. Since the tables were not altered, there was no need to modify any files, which simplified the task.

Inner joins involve a comparison ($E.id = S.employeeID$) and combine the tables based on this criterion. The program reads in the two tables and saves each row in separate lists, Table_1 and Table_2. The command provides values to compare (and their operand) and the names of the tables. A new list, Table_Join, is created. The join function uses a nested for-loop to iterate through both tables and compare the specified values. Matches are appended to Table_Join. If there is no match for the specified value, the columns from either table are not joined.

Left outer joins perform the same function as inner joins, but if there is no match for a value in Table_1, the program still inserts that record, with null information for the corresponding data in Table_2.

During the testing of tuple deletion in the new tables, a problem with line spacing came up. Specifically, the pipe delimiter lacked a space between it and the value, resulting in an "out of index" error. However, this issue has now been resolved.

Execution Commands

In a Unix environment, run the command `python3 main.py`

Python 3.7 or newer is required due to some of the syntax and functions used.

Please make sure all modules are placed in the same folder (dbutils, tableutils, joinutils and queryutils).

*The PA3_test.sql file contains same commands but was modified by:

- removing multi-line commands to make parsing simpler.
- fixed spacing issue with "create table" commands, wherein the opening parentheses was

not separated by a space from the table name.