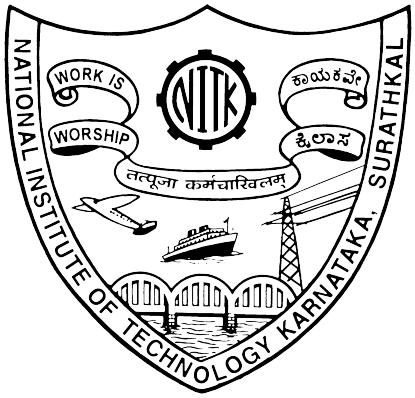
National Institute of Technology Karnataka

Department of Computer Science and Engineering



DATABASE SYSTEMS ASSIGNMENT

SQL Parser

SUBMITTED TO: Dr. Ravindranath C.

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OBJECTIVE AND SCOPE

The objective of this assignment is to implement a basic SQL parser that lets you perform the select and join operations along on tables.

System Requirements

Ubuntu (Inbuilt Python compiler)

Overview

The basic set of operations for the relational model is the **relational algebra**. These operations enable a user to specify basic retrieval requests as *relational algebra expressions*.

The result of retrieval is a new relation, which may have been formed from one or more relations. The algebra operations thus produce new relations, which can be further manipulated using operations of the same algebra.

A sequence of relational algebra operations forms a **relational algebra expression**, whose result will also be a relation that represents the result of a database query (or retrieval request).

The Relational algebra and Tuple Relational Calculus are theoretical models that form the base for actual implementations such as SQL.

We build a parser in python that lets user enter SQL type queries and returns results.

FUNCTIONS & EXPLANATION

- We import the ast library in python
- the student class holds our tuples
- project_field lets us select particular attributes from the relation
- select_condition lets us select tuples that satisfy a particular condition – this is the most involved function in the whole code, since it accounts for variable length conditions, various operators, etc
- project_condition – select particular attributes for all rows
- join works as follow join inputtable1 inputtable2 outputtable

- running a select on the outputtable will give you the join result

- you can also use the same syntax for theta join where you specify conditions after outputtable

- the parser initially takes the query as a string, converts it to a list and then to a dict so that each word can be accessed individually