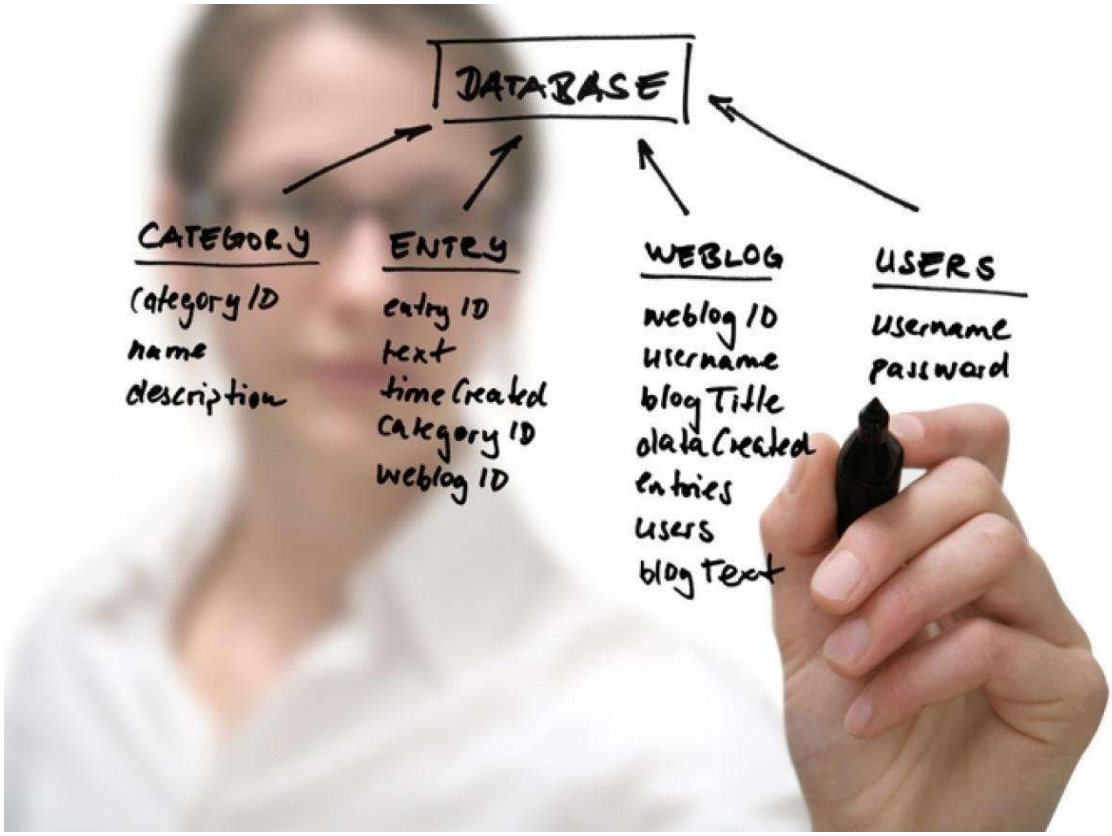
Programming II

DBMS



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Introduction

A Computer Database is a structured collection of records or data that is stored in a computer system. On the other hand, a Database Management System (DBMS) is a complex set of software programs that controls the organization, storage, management, and retrieval of data in a database. DBMS are categorized according to their data structures or types. The DBMS accepts requests for data from the application program and instructs the operating system to transfer the appropriate data.
The program has the following features :

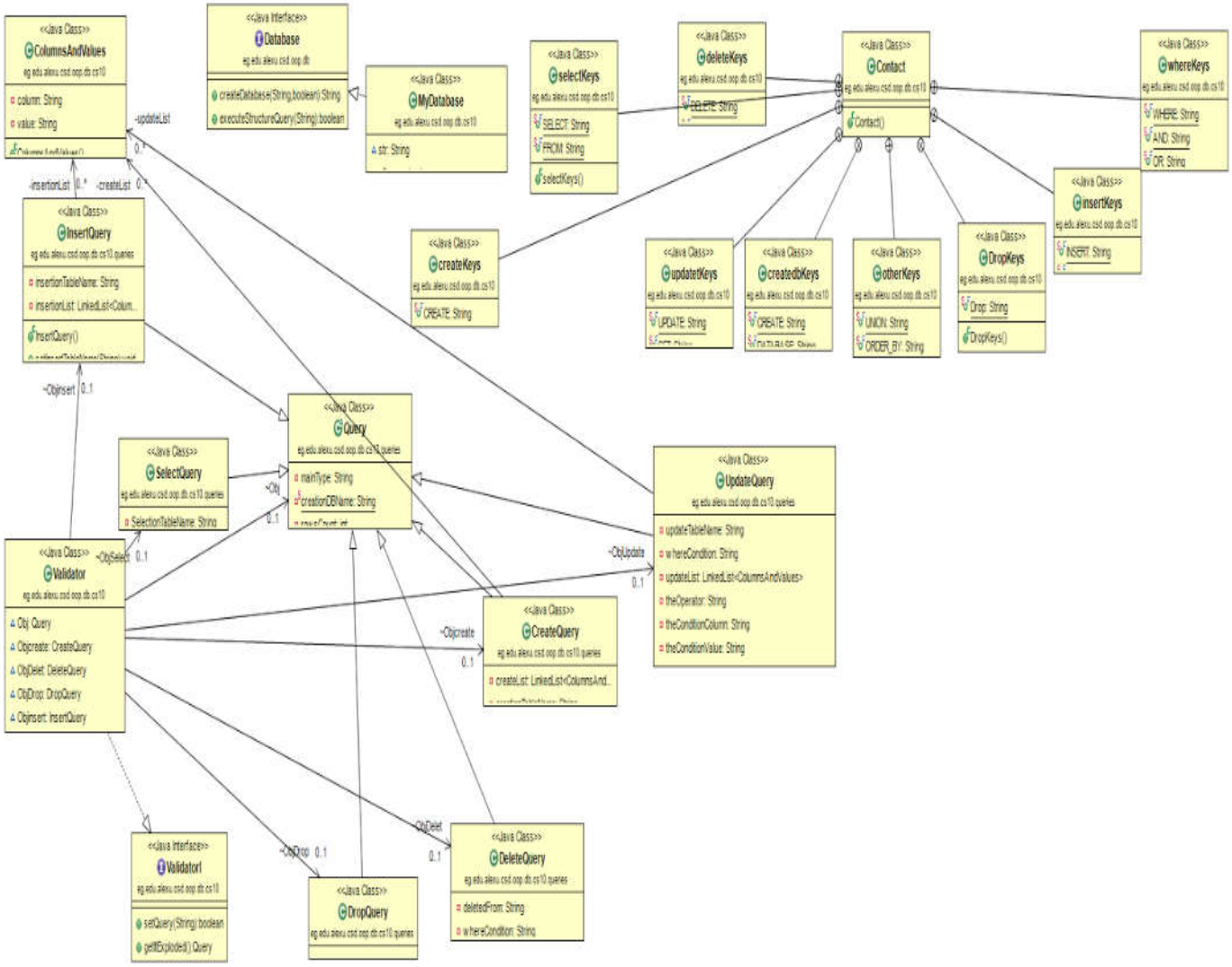
1. This program Implement a simple DBMS that handles data stored in XML files and supports the following SQL Statements:
    - o Create database
    - o Create table
    - o Insert into table
    - o Delete from table
    - o Drop database
    - o Drop table
    - o Select from table
    - o Update table

2. The DBMS controls the management and retrieval of data from data files.
The DBMS accepts requests for data from application programs
(in the form of the SQL queries) and retrieves and transfers the appropriate data from files that are stored physically on disk.

3. For statements which contain conditions (i.e. the Where clause), it supports only the simple conditions: =, >, and <.

4.The table supports only two types: varchar and int. “varchar” used to store string, and “int” to store numeric values.

UML diagram


ColumnsAndValues
column: String
value: String
Database
createDatabase(String,boolean): String
executeStructureQuery(String): boolean
MyDatabase
str: String
selectKeys
SELECT: String
FROM: String
selectKeys()
deleteKeys
DELETE: String
Contact
Contact()
whereKeys
WHERE: String
AND: String
OR: String
insertKeys
INSERT: String
InsertQuery
insertionTableName: String
insertionList: LinkedList<Colum...
InsertQuery()
createKeys
CREATE: String
updateKeys
UPDATE: String
createdbKeys
CREATE: String
otherKeys
UNION: String
ORDER_BY: String
DropKeys
Drop: String
DropKeys()
Query
mainType: String
creationDBName: String
SelectQuery
SelectionTableName: String
UpdateQuery
updateTableName: String
whereCondition: String
updateList: LinkedList<ColumnsAndValues>
theOperator: String
theConditionColumn: String
theConditionValue: String
Validator
Obj: Query
Objcreate: CreateQuery
ObjDelet: DeleteQuery
ObjDrop: DropQuery
Objinsert: InsertQuery
CreateQuery
createList: LinkedList<ColumnsAnd...
ValidatorI
setQuery(String): boolean
getIfExploded(): Query
DropQuery
DeleteQuery
deletedFrom: String
whereCondition: String
-updateList
-insertionList
-createList
-Objinsert
-ObjSelect
-Obj
-ObjUpdate
-Objcreate
-ObjDrop
-ObjDelet

Design description

- **Validation and parsing**

  This is the first stage of the program and it is responsible for validating the syntax of the query then it fetches the required query (SELECT,INSERT,...) to call the right command class that execute the query, it also separate the data and store them in a linked list and pass it to the command class that uses this data .

  Main Classes

  1. **Validator.java**

     Validate the input query and parse it and send the data to the correct Query class.

- **Executing query**

  In this stage the query is ready to be executed. The requested command has all the data to start execution and save in a XML file.

  Main Classes

  1. **Query.java**

     This is the abstract class for all the queries
  2. **Create.java**

     This query creates Database or table
  3. **Select.java**

     This query select columns from a table and returns them as an array of objects
  4. **Insert.java**

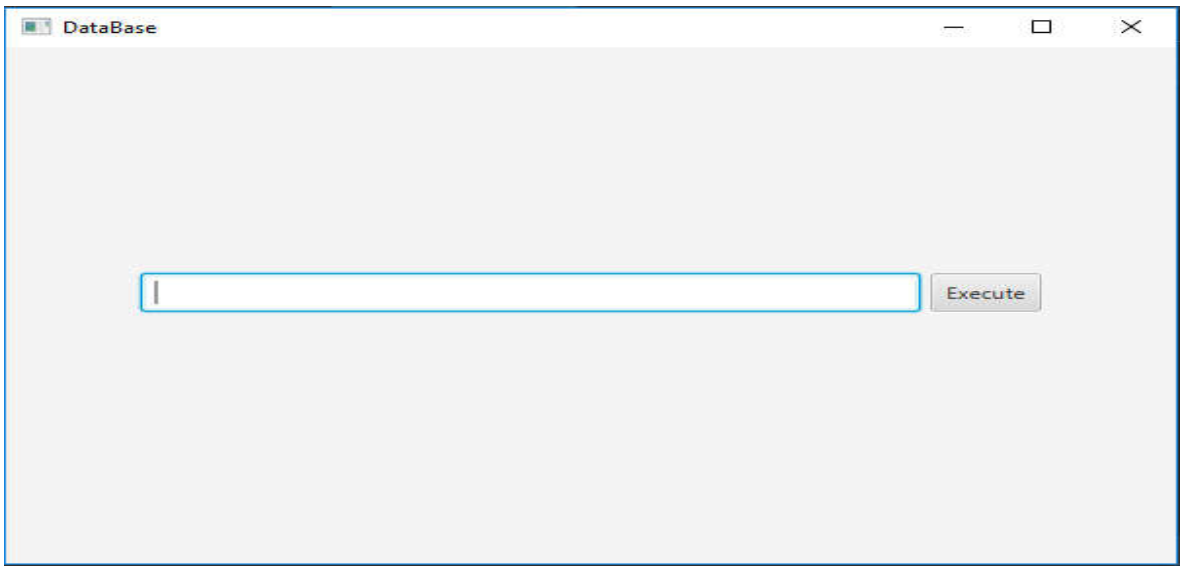
     This query inserts values to specific columns in a table under some condition
  5. **Update.java**

     This query updates values in a specific columns in a table under some condition or updates all the values in the columns if there is no condition.
  6. **Drop.java**

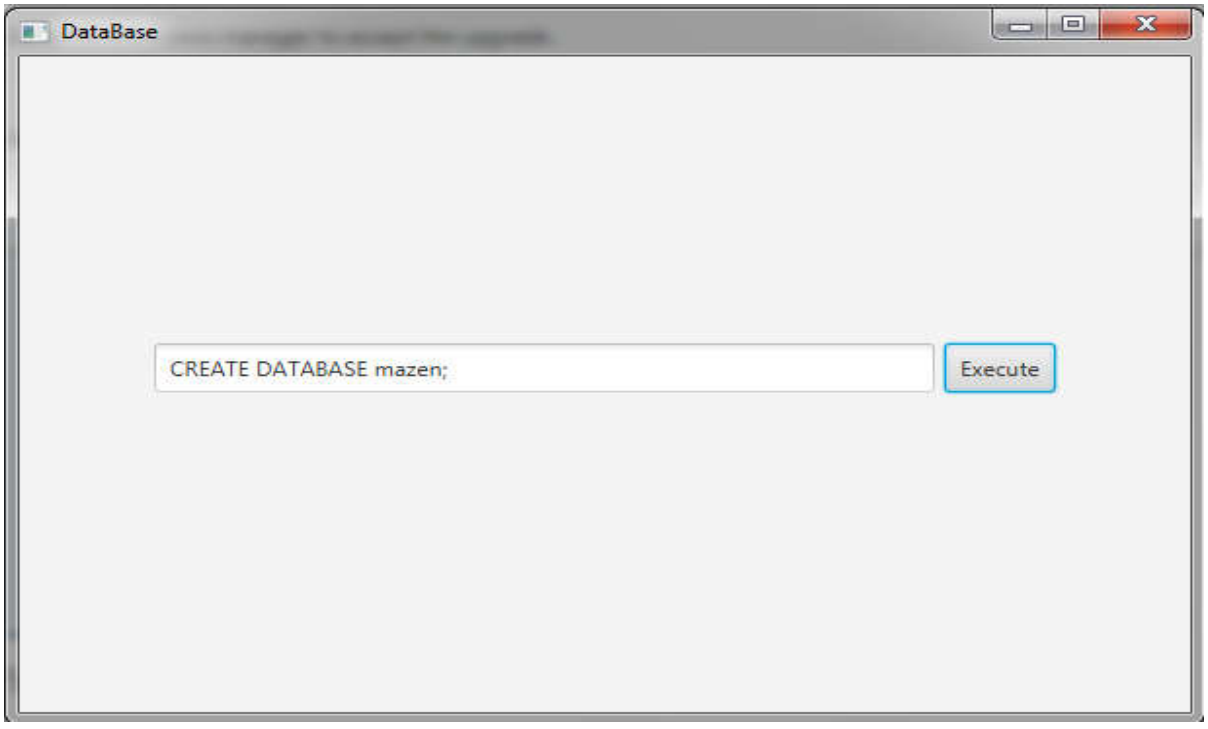
     This query deletes a database or a table
  7. **Delete.java**

     This query deletes a specific columns in a table under some condition.

Gui and user guide



Type the query and press execute.



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