Report

DBMS

Data Base Manager System.

BY:

- Omar Mohamed Emam 44
- Islam Yousry 14
- Islam Mohamed 12
- Bahaa Khlaf 21

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Database Management System

Program Specifications:

-The Program specify all SQL queries (Create, drop, insert, update, select, delete)

- Program uses dynamic loading for all of your databases, so you can edit them whenever you want

- Program is able to re-load your data no matter where you stored it

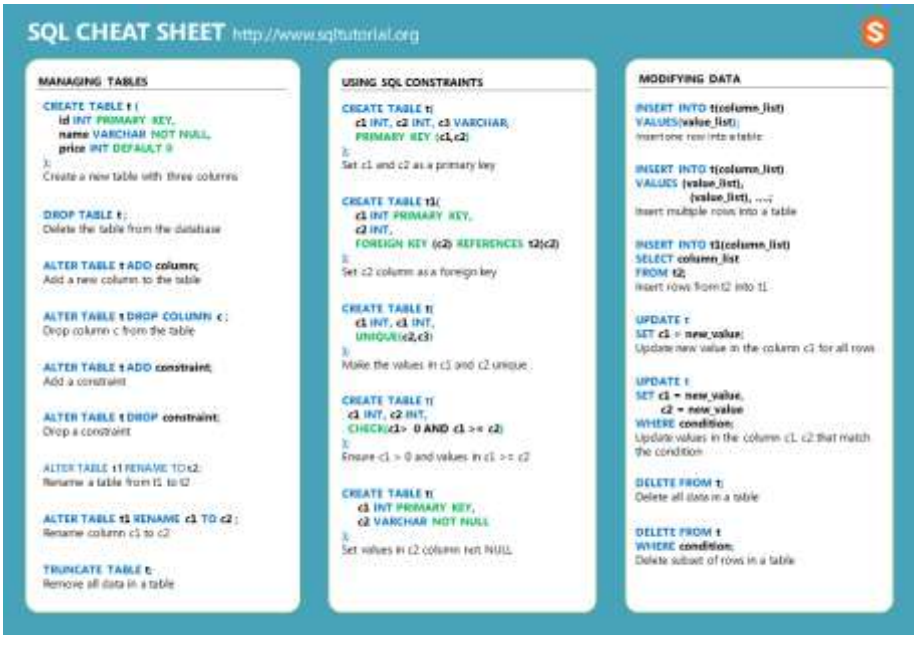
- Program is able to understand your SQL query in uppercase or lowercase and with spaces or not

- Program will keep running even if you entered in wrong syntax, you will be able to retry till you want to stop

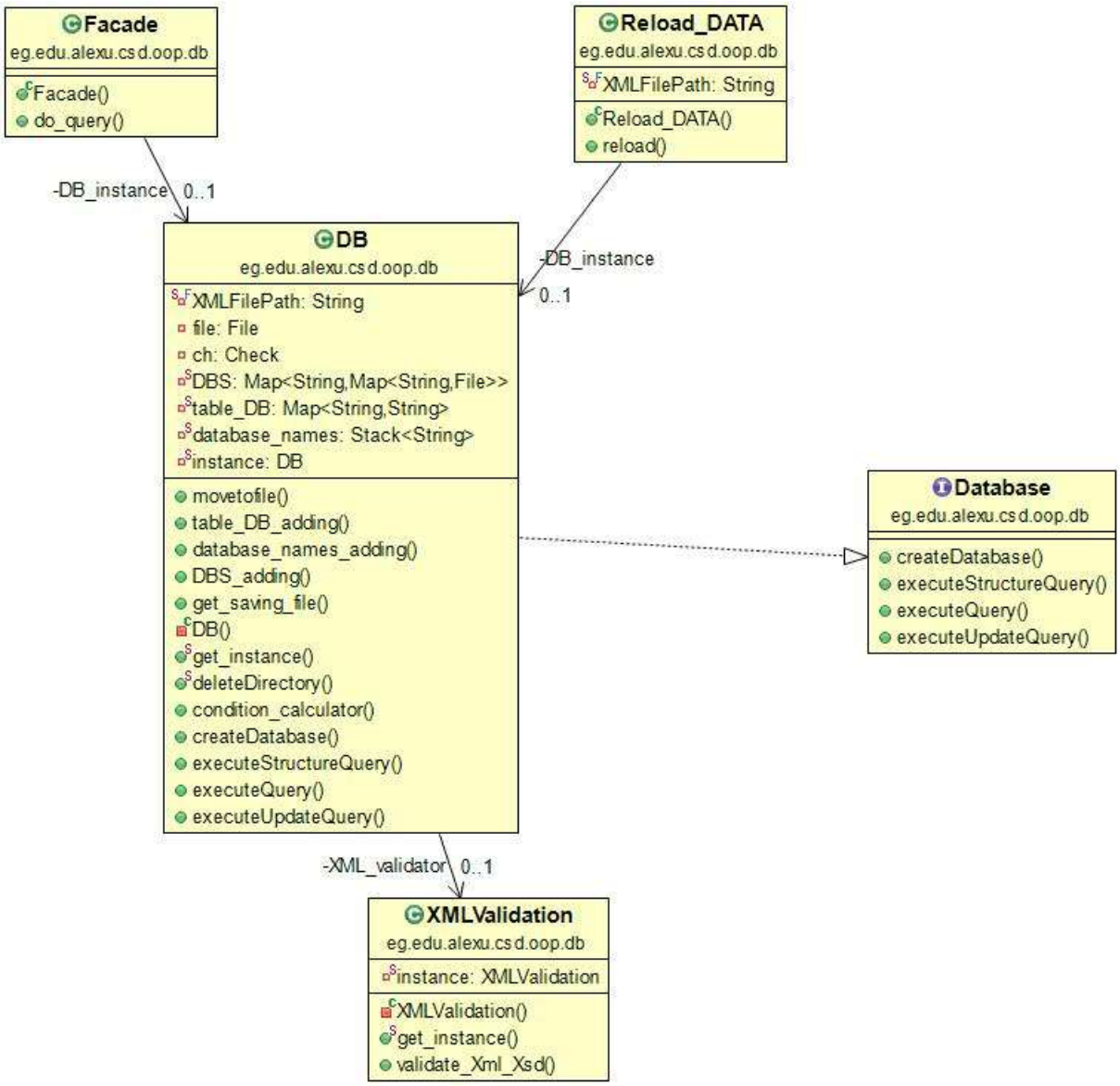
- Program runs through self-runnable Cmd app

User Guide:

Run “excucation.bat” and enter your SQL query in right syntax and then you can do more queries or exit by typing “end”.



UML Diagram:


Facade
eg.edu.alexu.csd.oop.db
Facade()
do_query()
-DB_instance
0..1
Reload_DATA
eg.edu.alexu.csd.oop.db
XMLFilePath: String
Reload_DATA()
reload()
-DB_instance
0..1
DB
eg.edu.alexu.csd.oop.db
XMLFilePath: String
file: File
ch: Check
DBS: Map<String,Map<String,File>>
table_DB: Map<String,String>
database_names: Stack<String>
instance: DB
movetofile()
table_DB_adding()
database_names_adding()
DBS_adding()
get_saving_file()
DB()
get_instance()
deleteDirectory()
condition_calculator()
createDatabase()
executeStructureQuery()
executeQuery()
executeUpdateQuery()
Database
eg.edu.alexu.csd.oop.db
createDatabase()
executeStructureQuery()
executeQuery()
executeUpdateQuery()
-XML_validator
0..1
XMLValidation
eg.edu.alexu.csd.oop.db
instance: XMLValidation
XMLValidation()
get_instance()
validate_Xml_Xsd()

Program Description:

After entering your sql query , it will be check by the regex through :

Check:

The check class is responsible for check if the input that token is in a correct syntax or not.

The check class has 6 function and these functions are : createcheck , updatecheck ,insertcheck , deletcheck ,selectcheck and dropcheck.

And these functions are called by the DB class.

Createcheck:

This function applied on any input start with the word (create) and this function check if the input is (create database database_name) , (create database (path)) , (create table table_name (column_name dataType)) by three regex and then it takes the wanted information by (split and regex) and return it in array and if the input was wrong syntax it returns null.

updatecheck:

This function applied on any input start with the word (update) and this function check if the input is (UPDATE *table_name* SET *column1* = *value1*, *column2* = *value2*, ... WHERE *condition*) or (UPDATE *table_name* SET *column1* = *value1*, *column2* = *value2*, ...) by two regex and then it takes the wanted information by (split and regex) and return it in array and if the input was wrong syntax it returns null.

insertcheck:

This function applied on any input start with the word (insert) and this function check if the input is (INSERT INTO *table_name* (*column1*, *column2*, *column3*, ...) VALUES (*value1*, *value2*, *value3*, ...)) or(INSERT INTO *table_name* VALUES (*value1*, *value2*, *value3*, ...)) by two regex and then it takes the wanted information by (split and regex) and return it in array and if the input was wrong syntax it returns null.

deletcheck:

This function applied on any input start with the word (delet) and this function check if the input is (DELETE FROM *table_name* WHERE *condition*) or (DELETE FROM *table_name*) by two regex and then it takes the wanted information by (split and regex) and return it in array and if the input was wrong syntax it returns null.

selectcheck:
This function applied on any input start with the word (select) and this function check if the input is (SELECT *column1*, *column2, ...*
FROM *table_name*) or (SELECT *column1*, *column2, ...* FROM *table_name where condition*) or (SELECT * FROM *table_name*) or (SELECT * FROM *table_name where condition*) by four regex and then it takes the wanted information by (split and regex) and return it in array and if the input was wrong syntax it returns null.
dropcheck:
This function applied on any input start with the word (drop) and this function check if the input is (DROP DATABASE *databasename*) or (DROP TABLE *table_name*) by two regex and then it takes the wanted information by (split and regex) and return it in String and if the input was wrong syntax it returns null.
After Checking The Query:

We use Java DOM(Document Object Model) to create and parse XML files by representing the document in tree structure.
We use Java XSD (XML Schema Definition) to describe the structure of the xml file(data types of each element and the sequence of elements of each row)
The class XMLValidation is used to determine whatever the xml file is good structured or not

Design Patterns:

1- **Facade design pattern**: used to decide which method in the interface execute dependent on the input query.
2- **Singleton design pattern**: to make one instance of object.

Sample Runs:

First run & generated xml

```
D:\DBMS>java -jar DBMS.jar
*****************************Welcome TO Our DBMS*****************************
Enter Your SQL query in right synatx (to exit just right'end'):
create database test_database
DataBase>> test_database << is Created and Saved
Enter Your SQL query in right synatx (to exit just right'end'):
create table test_table (col1 int , col2 varchar , col3 int , col4 varchar )
Table>> test_table << is Created
Enter Your SQL query in right synatx (to exit just right'end'):
insert into test_table (col1 ) values (100)
You Inserted Into >> test_table
Enter Your SQL query in right synatx (to exit just right'end'):
insert into test_table (col2 , col4 ) values ('try','tryagian')
You Inserted Into >> test_table
Enter Your SQL query in right synatx (to exit just right'end'):
insert into test_table (col3 ) values (300)
You Inserted Into >> test_table
Enter Your SQL query in right synatx (to exit just right'end'):
update test_table set col3 = 500 where col3 = 300
You Updated >> test_table
Enter Your SQL query in right synatx (to exit just right'end'):
end
*****************************Hope You Enjoyed Our DBMS*****************************

D:\DBMS>pause
Press any key to continue . . .
```

```
<?xml version="1.0" encoding="UTF-8"?>
- <test_table>
  - <table_details>
      <col1 type="integer"/>
      <col2 type="string"/>
      <col3 type="integer"/>
      <col4 type="string"/>
    </table_details>
  - <id>
      <col1>100</col1>
    </id>
  - <id>
      <col2>try</col2>
      <col4>tryagian</col4>
    </id>
  - <id>
      <col3>500</col3>
    </id>
</test_table>
```

After Reloading and editing

```
D:\DBMS>java -jar DBMS.jar
*****************************Welcome TO Our DBMS*****************************
Enter Your SQL query in right synatx (to exit just right'end'):
select * from test_table
selected values:
=============================================
100     null    null    null
=============================================
null    try     null    tryagian
=============================================
null    null    500     null
=============================================
Enter Your SQL query in right synatx (to exit just right'end'):
drop table test_table
Enter Your SQL query in right synatx (to exit just right'end'):
drop database test_database
DataBase>> test_database << is Dropped and Deleted
Enter Your SQL query in right synatx (to exit just right'end'):
end
*****************************Hope You Enjoyed Our DBMS*****************************

D:\DBMS>pause
Press any key to continue . . .
```

```
Enter Your SQL query in right synatx (to exit just right'end'):
create database second_test
DataBase>> second_test << is Created and Saved
Enter Your SQL query in right synatx (to exit just right'end'):
create table t1 (c1 int , c2 varchar)
Table>> t1 << is Created
Enter Your SQL query in right synatx (to exit just right'end'):
insert into t1 (c1 ,c2 ) values (50 , 'new')
You Inserted Into >> t1
Enter Your SQL query in right synatx (to exit just right'end'):
select * from t1
selected values:
=============================================
50      new
=============================================
Enter Your SQL query in right synatx (to exit just right'end'):
create table t2 (c1 int , c2 int ,c3 int)
Table>> t2 << is Created
Enter Your SQL query in right synatx (to exit just right'end'):
insert into t2 (c3) values (565)
You Inserted Into >> t2
Enter Your SQL query in right synatx (to exit just right'end'):
drop table t2
Table> t2 << is Dropped
Enter Your SQL query in right synatx (to exit just right'end'):
end
**************************Hope You Enjoyed Our DBMS*****************************

D:\DBMS>pause
Press any key to continue . . .
```