Alexandria University

Faculty of Engineering

Computer and Systems Engineering Department

CS 221: Programming 2

XML _DBMS Report

Name of Students:

-Mohamed Ibrahim Shaban

-Mohamed Elsayed Helmy

-Mohab mosaad Atia

-Wessam Yakout Mohamed

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. On the other hand, Extensible Markup Language (XML) is a set of rules for encoding documents in machine readable form.

Description of Project

Our project is that: implementation of a simple DBMS that handles data stored in XML files.

You should support the following SQL Statements:

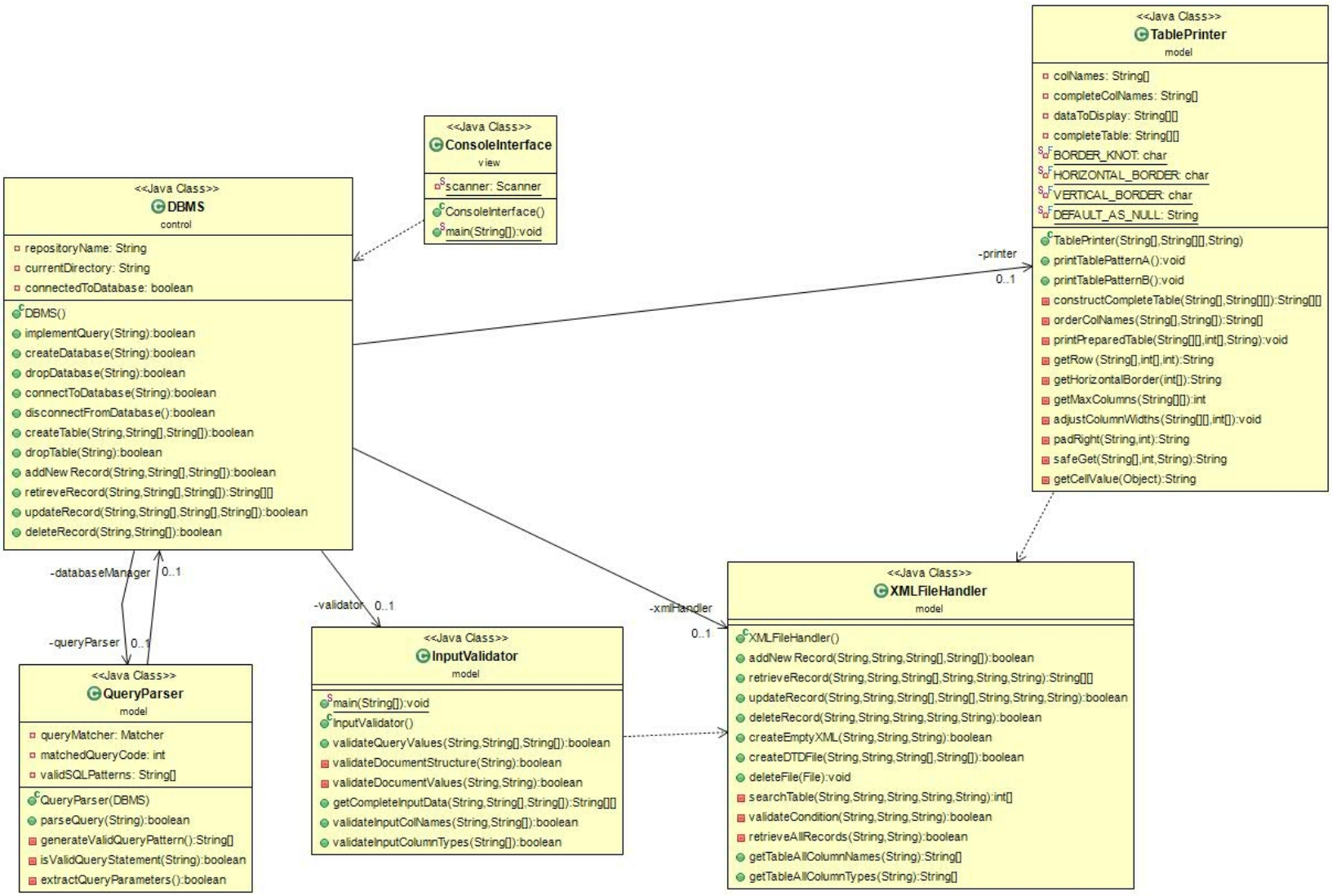
Create database , Create table .

Insert into table ,Delete from table .

Drop database ,Drop table .

Select from table ,Update table.

UML Diagram



Our project is divided into 3 parts:

1- **<u>View</u>**

It is responsible for taking input from user , and it contain 2 classes
Console Interface which contain main method.
User Interface Class.

2- Model

It contain four classes:

1-Query parser Class:

It take query from user and parse the string input, it give as an analysis about query.
Query parser contain four methods:
1-boolean isValidQueryParser():to check if the query parser is valid or not.
2-boolean extractQueryParameter():to extract query parameter and check if it valid or not.
3-String [ ] generateValidQueryPattern(): make a valid query after check it valid then we can use this pattern to extract parameters for Many function.
4-boolean parseQuery(String query):control the first 2 functions.

2-inputValidator

This class contain six methods:

1-boolean validateInputColNames(String dtdFileDirectory,String [] colNames) :

check if the column Name is valid or not meaning by valid is Table contain it.

2-boolean validateInputColTypes(String []colTypes):check if the column Type is valid or not .

Meaning that if use enter any data type except "int","varchar" it should return false.

3-boolean validateDocumentValues(String xmlFileDirectory ,String dtdFileDirectory)

Check if the value of an column is valid or not .

Meaning that if user enter an "varchar" value in column which has "int" data it should return false.

4-boolean validateDocumentStructure(String xmlFileDirectory)

It check if xml document follow the dtd document using "SAX"parser.

5-String [][] getCompleteInputData(String dtdFileDirectory,String [] colNames,String []columnValues)

It return 2d array contain all data of a table which are columnNames,columnValues.

6-boolean validateQueryValues(String tableXmlDirectory,String[]allColNames,sString []allColValues)

Control the other function in this class ,and function in XMLFileHandler Class.

And it make the Directory of xml file and dtd file.

3-XML File Handler

This class contain twelve methods:

1-boolean addNewRecord(String tableName,String fileDirectory,String[] colNames,String []data).

Return true value if it could add new record

Return false if it couldn't.

2-boolean updateRecord(String tableName,String fileDirectory,String[]colNames,String[]updateValues,String testCol,String operation,String condition)

Return true value if it could update a value or more in the table

Return false if it couldn't.

3-boolean deleteRecord(String tableName, String fileDirectory,,String testCol,String operation,String condition)

Return true value if it could delete a value or more in the table

Return false if it couldn't.

4-void deleteFile(String selectedFile)

5-boolean createEmptyXml(String tableName,String targetDirectory,String dtdFileName)

6-boolean createDtDFile.

7-[][]String retrieveRecord(String tableName,String fileDirectory,String[]colNames,String[]updateValues,String testCol,String operation,String condition)

It return 2d array contain data which user select.

8-boolean retrieveAllRecords(String tableName,String testValue)

9-boolean validateCondition(String LHS,String LHS,String operation)

10-String[] getTableAllColumnsName(String dtdFileDirectory)

11-int[] searchTable(String tableName,String fileDirectory,String

testCol,String operation,String condition)

it return the indexes of records which achieve the condition.

12-boolean String getTableAllColumnTypes(String dtdFileDirectory)

4-TablePrinter

It's responsible for printing the selected data from the table at table form

"function in this class we didn't implement it we take it from stack overflow"

3- Control

This package contain one interface and one Class.

IDBMS interface

Contain eleven methods which implemented by DBMS Class.

DBMS Class

Implement IDBMS interface.
Methods in it:
1-boolean implementQuery(String userQuery)
It call parseQuery(userQuery)in Queryparser class
To check if the query is valid or not.

2-boolean createDatabase(String databaseName)
3-boolean dropDatabase(String databaseName)
To delete data base.
4-boolean connectToDatabase(String databaseName)
Connect user to only one database.
5-boolean disconnectFromDatabase()
Disconnect the user from any database.
6-boolean createTable(String tableName,String[] colNames,String colTypes)
7-boolean dropTable(String tableName);
Delete table meaning that delet xml file and dtd file.
8-boolean deleteRecord(String tableName,String [] conditionStatement)
It call deleteRecord methon in xmlFileHandler class.
9-boolean addNewRecord(String tableName, String[]collNames,String []colValues)
It call addNewRecord methon in xmlFileHandler class.

10-boolean updateRecord(String tableName, String[]collNames,
String []newData,String[] conditionStatement)

It call updateRecord methon in xmlFileHandler class.

11-String retrieveRecord(String tableName,String[]colNames, String[] conditionStatement)
It call retrieve Record methon in xmlFileHandler class.

User Guide
Only user need to know how to write SQL Language.
User query should token as a command.
And this link for basic SQL" http://www.w3schools.com/sql/default.asp"

Example
User will see the output in select statement in SQL .
And this is an example for form the output in select statement.

```
UPDATE prof
SET name="Mahmoud",age="38",salary="8000"
WHERE age=43;
Record Updated Successfully...
>>

SELECT * FROM prof;
+-------+---+------+
|name   |age|salary|
+-------+---+------+
|mohamed|40 |10000 |
+-------+---+------+
|hassan |39 |7500  |
+-------+---+------+
|mahmoud|38 |8000  |
+-------+---+------+
|khaled |38 |9000  |
+-------+---+------+
>>
```

```
use pepsi;
Connected To pepsi
>>

select * from clients;
+-------+-------+-----+
|name   |email  |phone|
+-------+-------+-----+
|mohab  |gmail  |123  |
+-------+-------+-----+
|ali    |outlook|321  |
+-------+-------+-----+
|mohamed|yahoo  |456  |
+-------+-------+-----+
|ahmad  |hotmail|654  |
+-------+-------+-----+
>>
```