Faculty of Engineering, Alexandria University
Computers and Systems Engineering Department
Second year: (CS 221) Programming II
Assignment III - Report

XML DBMS
Database Management System

Made by:

Bishoy Nader Fathy (22)

Amr Mohamed NasrEldine (46)

Marc Magdi Kamel (52)

Michael Raafat Mikhail (55)

I. Design Description

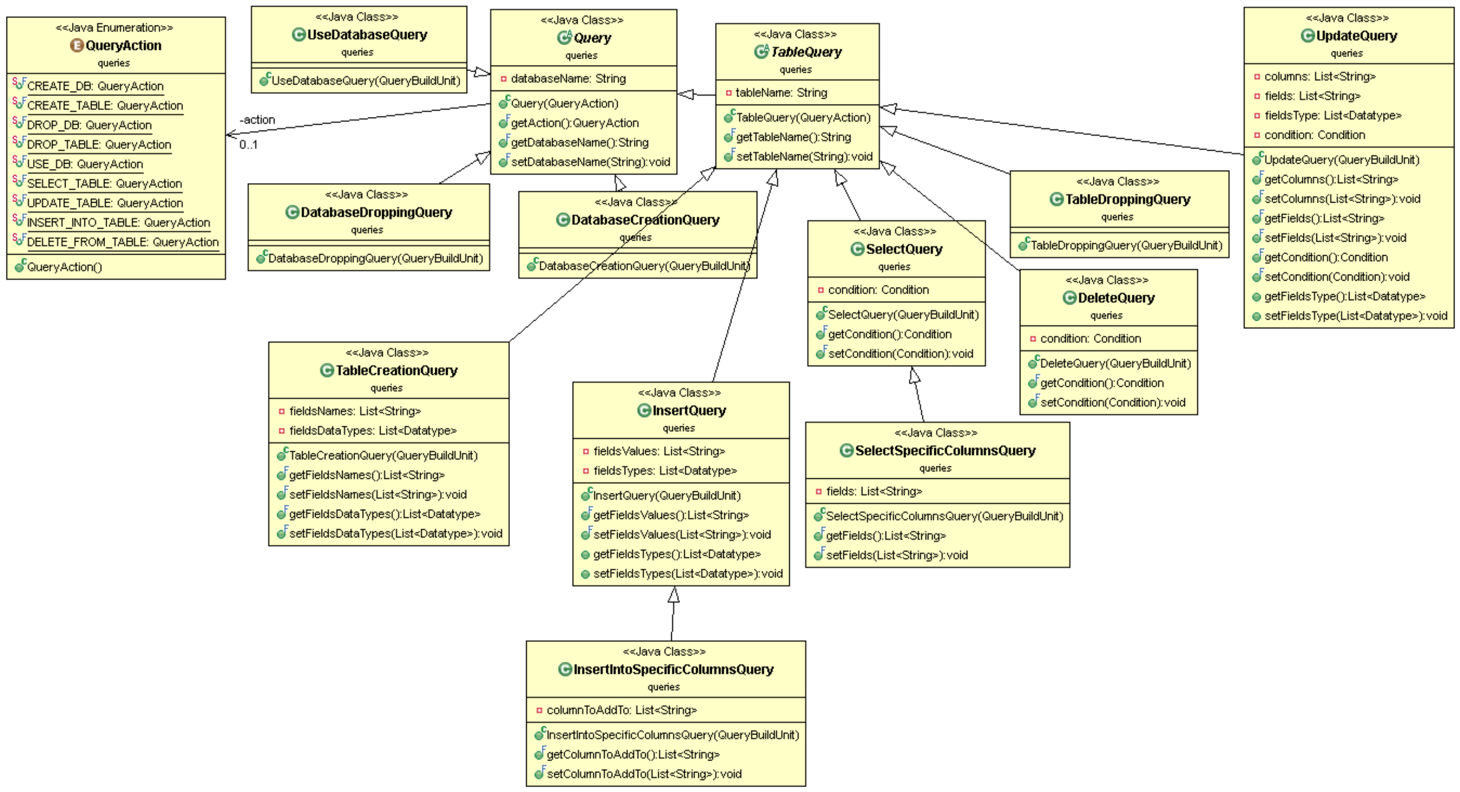
We divided the application into some main packages:

1- **console**: containing the main class to run the application.
2- **consolePortal**: connects between the parser, the database engine the logger.
3- **databaseManagement**: containing the engine class which connects the fileManager with the models and the conditionService.
4- **parser**: responsible for parsing a given string and returns a strongly datatype query or a syntax error.
5- **logs:** responsible for printing results and error messages.
6- **fileManager:** responsible for directories and Xml files reading, writing and deleting.
7- **conditionService**: responsible for processing simple conditions like >, < or = and complex ones like AND or OR.
8- **models**: contains interfaces for the models (Database, Table, Row …).
9- **modelsImp**: containing implementation for models interfaces.
10- **queries**: contains classes for every query type (insertQuery, DatabseCreationQuery, ...).
11- **logicalComponents:** contains models that are used by the condition service.
12- **exceptions**: contains our own defined exceptions.

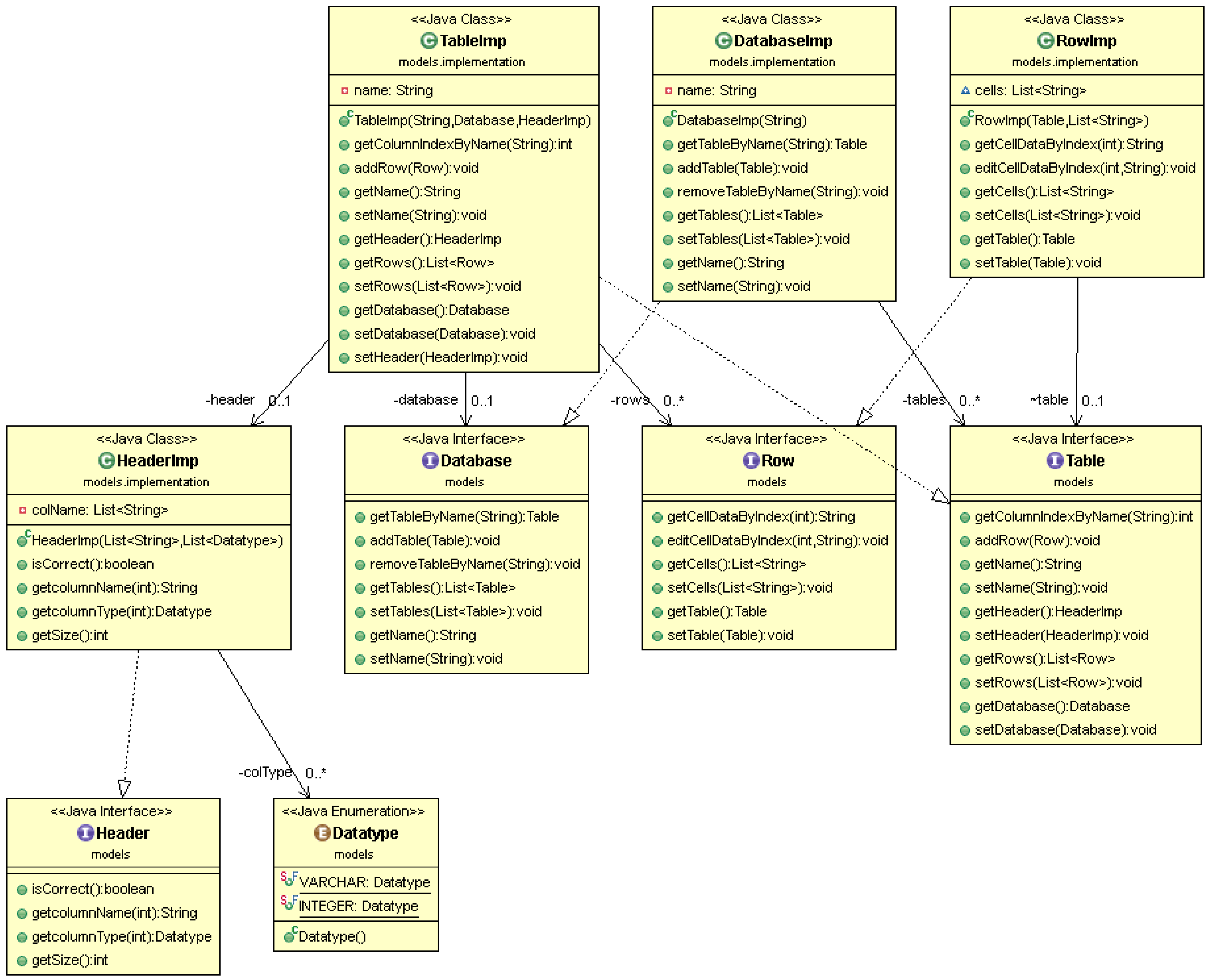
II. Design decisions:

- The user can type "use db_name" and then he no longer needs to type the database name of the following commands.
- He can also use the formula db_name.table_name for selecting the desired database.

III. UML Diagram

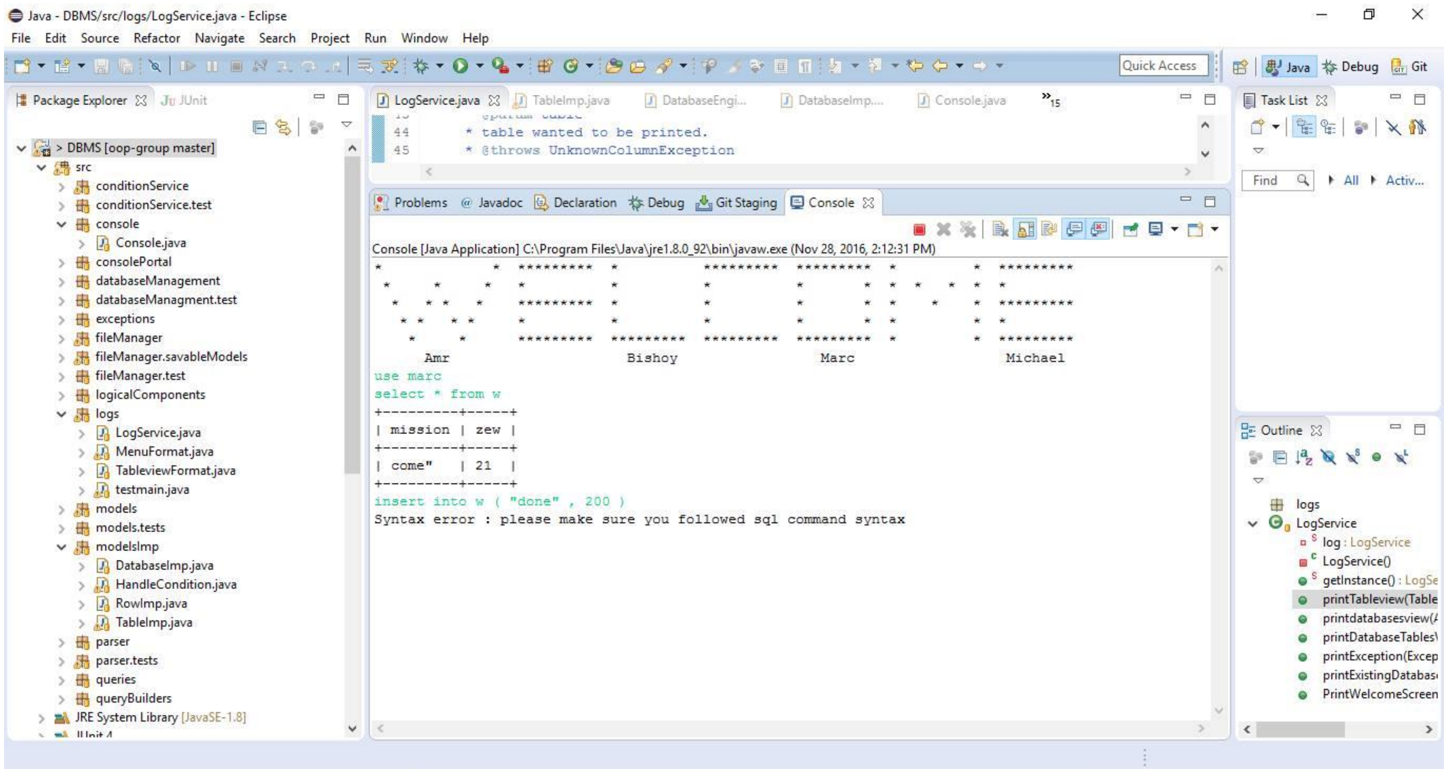


<<Java Enumeration>> QueryAction queries
CREATE_DB: QueryAction
CREATE_TABLE: QueryAction
DROP_DB: QueryAction
DROP_TABLE: QueryAction
USE_DB: QueryAction
SELECT_TABLE: QueryAction
UPDATE_TABLE: QueryAction
INSERT_INTO_TABLE: QueryAction
DELETE_FROM_TABLE: QueryAction
QueryAction()
-action
0..1
<<Java Class>> UseDatabaseQuery queries
UseDatabaseQuery(QueryBuildUnit)
<<Java Class>> Query queries
databaseName: String
Query(QueryAction)
getAction():QueryAction
getDatabaseName():String
setDatabaseName(String):void
<<Java Class>> TableQuery queries
tableName: String
TableQuery(QueryAction)
getTableName():String
setTableName(String):void
<<Java Class>> UpdateQuery queries
columns: List<String>
fields: List<String>
fieldsType: List<Datatype>
condition: Condition
UpdateQuery(QueryBuildUnit)
getColumns():List<String>
setColumns(List<String>):void
getFields():List<String>
setFields(List<String>):void
getCondition():Condition
setCondition(Condition):void
getFieldsType():List<Datatype>
setFieldsType(List<Datatype>):void
<<Java Class>> DatabaseDroppingQuery queries
DatabaseDroppingQuery(QueryBuildUnit)
<<Java Class>> DatabaseCreationQuery queries
DatabaseCreationQuery(QueryBuildUnit)
<<Java Class>> TableDroppingQuery queries
TableDroppingQuery(QueryBuildUnit)
<<Java Class>> SelectQuery queries
condition: Condition
SelectQuery(QueryBuildUnit)
getCondition():Condition
setCondition(Condition):void
<<Java Class>> DeleteQuery queries
condition: Condition
DeleteQuery(QueryBuildUnit)
getCondition():Condition
setCondition(Condition):void
<<Java Class>> TableCreationQuery queries
fieldsNames: List<String>
fieldsDataTypes: List<Datatype>
TableCreationQuery(QueryBuildUnit)
getFieldsNames():List<String>
setFieldsNames(List<String>):void
getFieldsDataTypes():List<Datatype>
setFieldsDataTypes(List<Datatype>):void
<<Java Class>> InsertQuery queries
fieldsValues: List<String>
fieldsTypes: List<Datatype>
InsertQuery(QueryBuildUnit)
getFieldsValues():List<String>
setFieldsValues(List<String>):void
getFieldsTypes():List<Datatype>
setFieldsTypes(List<Datatype>):void
<<Java Class>> SelectSpecificColumnsQuery queries
fields: List<String>
SelectSpecificColumnsQuery(QueryBuildUnit)
getFields():List<String>
setFields(List<String>):void
<<Java Class>> InsertIntoSpecificColumnsQuery queries
columnToAddTo: List<String>
InsertIntoSpecificColumnsQuery(QueryBuildUnit)
getColumnToAddTo():List<String>
setColumnToAddTo(List<String>):void



IV. User Guide

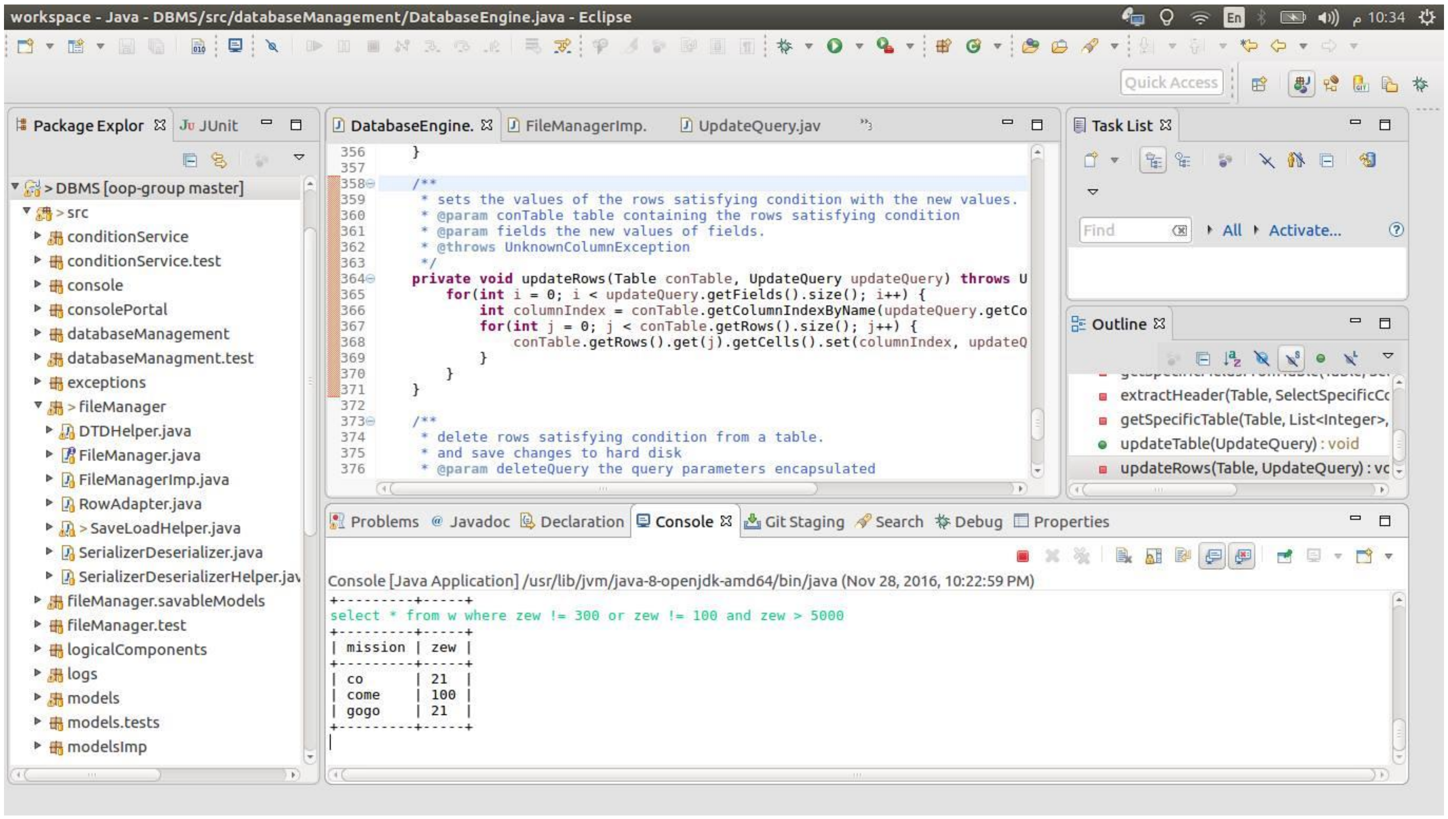
- The user simply run the application and write SQL queries for create database, create table, insert into table, drop table, drop database using the normal sql syntax.
- When choosing varchar don't specify its length.
- When selecting from table the results will appear on the screen formatted as a table.
- The program supports and statements and or statements as complex conditions on selection from a table it also supports >= , != and <= operations.



```
     * table wanted to be printed.
     * @throws UnknownColumnException
```

Console [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (Nov 28, 2016, 2:12:31 PM)

```
*             *  *********  *          *********  *********  *        *  *********
 *     *     *   *          *          *          *       *  *  *   * *  *
  *   * *   *    *********  *          *          *       *  *    *   *  *********
   * *   * *     *          *          *          *       *  *        *  *
    *     *      *********  *********  *********  *********  *        *  *********
     Amr                       Bishoy                Marc                  Michael
use marc
select * from w
+---------+-----+
| mission | zew |
+---------+-----+
| come"   | 21  |
+---------+-----+
insert into w ( "done" , 200 )
Syntax error : please make sure you followed sql command syntax
```


workspace - Java - DBMS/src/databaseManagement/DatabaseEngine.java - Eclipse
En 10:34
Quick Access
Package Explor JUnit
> DBMS [oop-group master]
> src
conditionService
conditionService.test
console
consolePortal
databaseManagement
databaseManagment.test
exceptions
> fileManager
DTDHelper.java
FileManager.java
FileManagerImp.java
RowAdapter.java
> SaveLoadHelper.java
SerializerDeserializer.java
SerializerDeserializerHelper.jav
fileManager.savableModels
fileManager.test
logicalComponents
logs
models
models.tests
modelsImp
DatabaseEngine. FileManagerImp. UpdateQuery.jav
Task List
Find All Activate...
Outline
extractHeader(Table, SelectSpecificC
getSpecificTable(Table, List<Integer>,
updateTable(UpdateQuery) : void
updateRows(Table, UpdateQuery) : vc
Problems Javadoc Declaration Console Git Staging Search Debug Properties

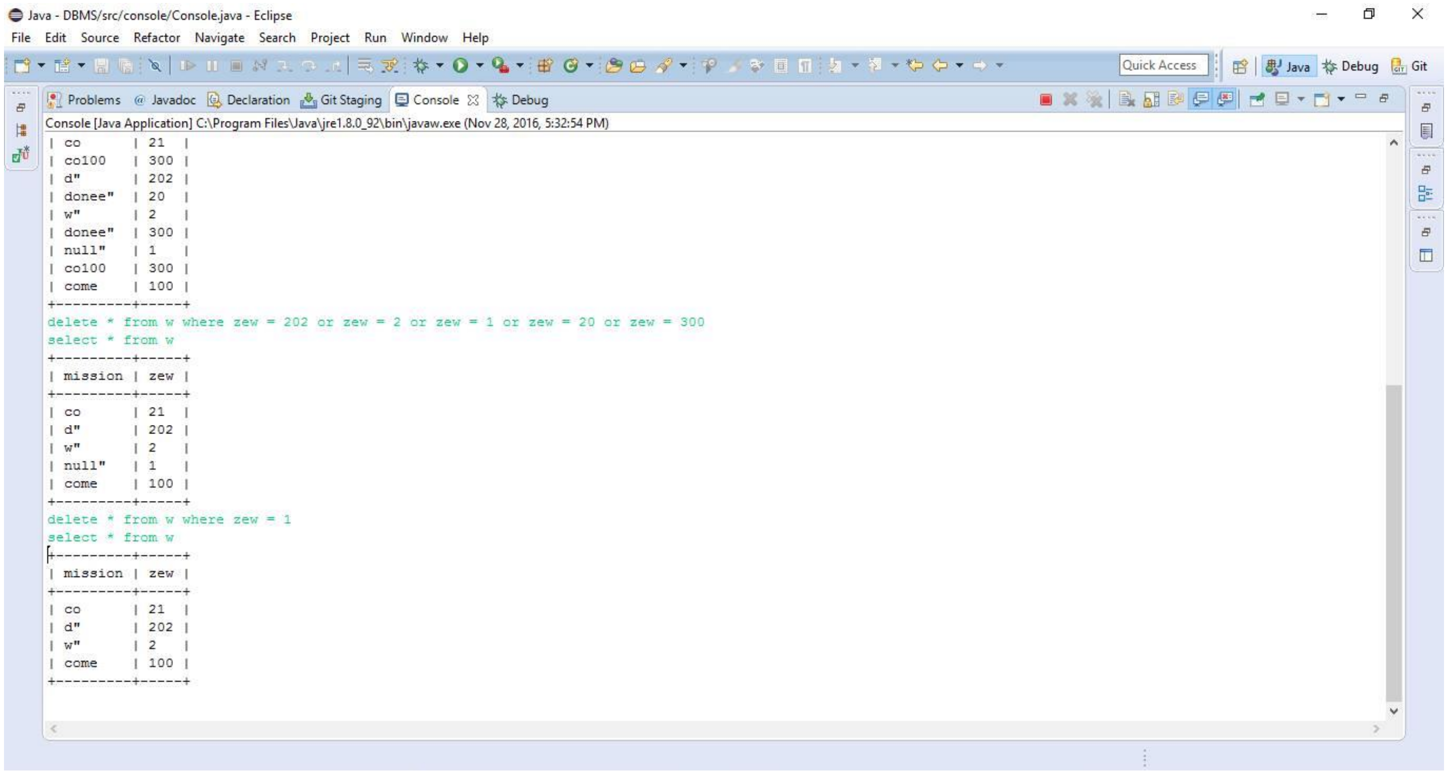
```java
    }

    /**
     * sets the values of the rows satisfying condition with the new values.
     * @param conTable table containing the rows satisfying condition
     * @param fields the new values of fields.
     * @throws UnknownColumnException
     */
    private void updateRows(Table conTable, UpdateQuery updateQuery) throws U
        for(int i = 0; i < updateQuery.getFields().size(); i++) {
            int columnIndex = conTable.getColumnIndexByName(updateQuery.getCo
            for(int j = 0; j < conTable.getRows().size(); j++) {
                conTable.getRows().get(j).getCells().set(columnIndex, updateQ
            }
        }
    }

    /**
     * delete rows satisfying condition from a table.
     * and save changes to hard disk
     * @param deleteQuery the query parameters encapsulated
```

Console [Java Application] /usr/lib/jvm/java-8-openjdk-amd64/bin/java (Nov 28, 2016, 10:22:59 PM)

```
+---------+-----+
select * from w where zew != 300 or zew != 100 and zew > 5000
+---------+-----+
| mission | zew |
+---------+-----+
| co      | 21  |
| come    | 100 |
| gogo    | 21  |
+---------+-----+
```


Java - DBMS/src/console/Console.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Java
Debug
Git
Problems
@ Javadoc
Declaration
Git Staging
Console
Debug

Console [Java Application] C:\Program Files\Java\jre1.8.0_92\bin\javaw.exe (Nov 28, 2016, 5:32:54 PM)

```
| co       | 21  |
| co100    | 300 |
| d"       | 202 |
| donee"   | 20  |
| w"       | 2   |
| donee"   | 300 |
| null"    | 1   |
| co100    | 300 |
| come     | 100 |
+---------+-----+
delete * from w where zew = 202 or zew = 2 or zew = 1 or zew = 20 or zew = 300
select * from w
+---------+-----+
| mission | zew |
+---------+-----+
| co      | 21  |
| d"      | 202 |
| w"      | 2   |
| null"   | 1   |
| come    | 100 |
+---------+-----+
delete * from w where zew = 1
select * from w
+---------+-----+
| mission | zew |
+---------+-----+
| co      | 21  |
| d"      | 202 |
| w"      | 2   |
| come    | 100 |
+---------+-----+
```