DBMS & JDBC Assignment

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.

Java Database Connectivity (JDBC) is an application programming interface (API) for the programming language Java, which defines how a client may access a database. It is Java based data access technology and used for Java database connectivity. It is part of the Java Standard Edition platform, from Oracle Corporation. It provides methods to query and update data in a database, and is oriented towards relational databases.

User Guide

First Window :

- A label to write the Database URL that you want to connect with showing two buttons : ‘connect ‘ , ‘disconnect ‘ , notifying when the connection is opened or closed .

- Press ‘Enter Query ‘ button to show another window letting you enter the query u need to operate on the database .

Second Window :

- When the query entered is colored with red , this means the syntax of the query is wrong , vise versa with green colored .
- You can add queries to the batch and execute batch .

Third window :

- After executing the queries a window with the returned data is shown .

Design Patterns

- **MVC**
    - On each project, we were assiduous to apply all MVC rules by separating the block of view from the Model and Control them by the controller
- **Factory**
    - We used it in creating objects from classes that implement the commands
- **Command**
    - We used it to implement different queries

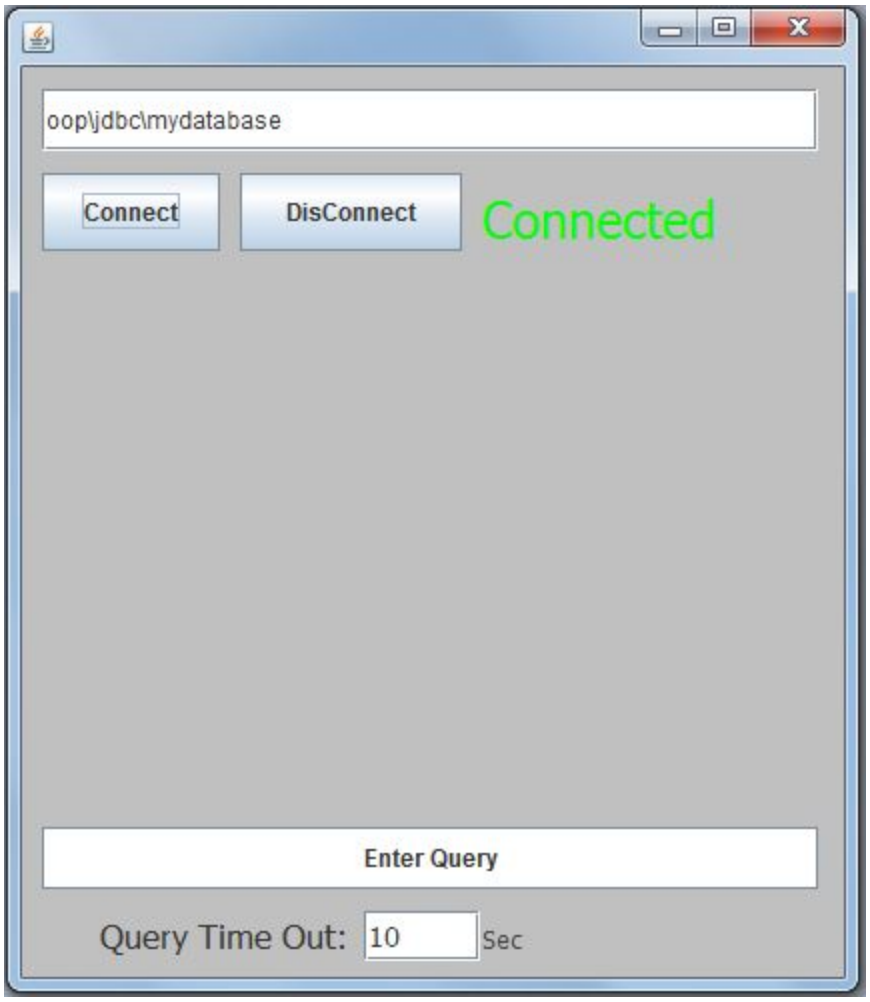
- **Facade**
    - We used the CreateStatement class as the class chooser to make instance for the needed class to operate the wanted command. All classes are extending the Statement class.
- **Iterator**
    - For sure is iterator is automatically used in ResultSet as the user can iterate the resultSet array by calling methods such as getNext(), getPrev() and current().
- **Pool**
    - We used it to avoid repeated instantiation of Connection, Statement, and ResultSet, also to close the object after using it. It increased the performance of the program.
- **Adapter**
    - We used it to implement the required methods only from the interface.
- **Singleton**
    - We used it in dbms , a Singleton to the Object of the Current Database Implementation in order to call it in the controllers of different GUI windows

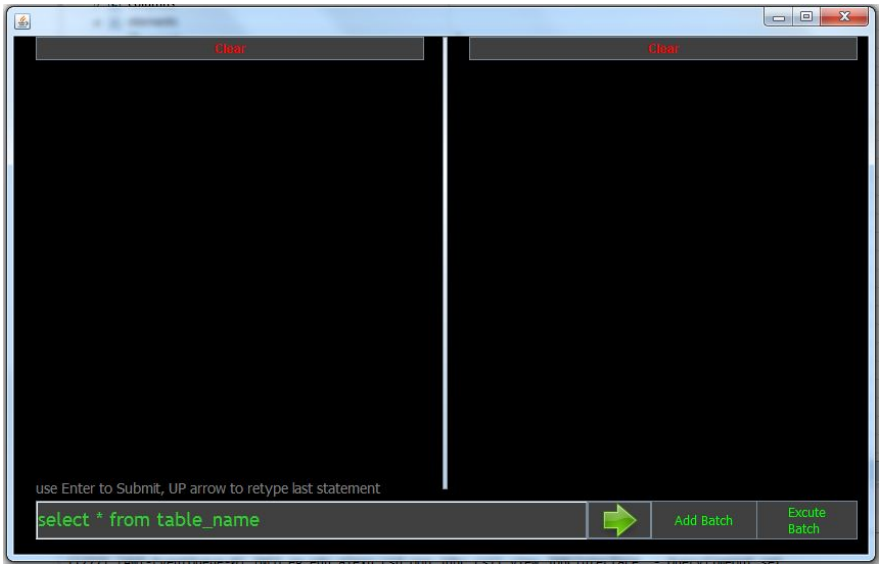
Assumptions

- The user can't pick a name with a single quote between characters.

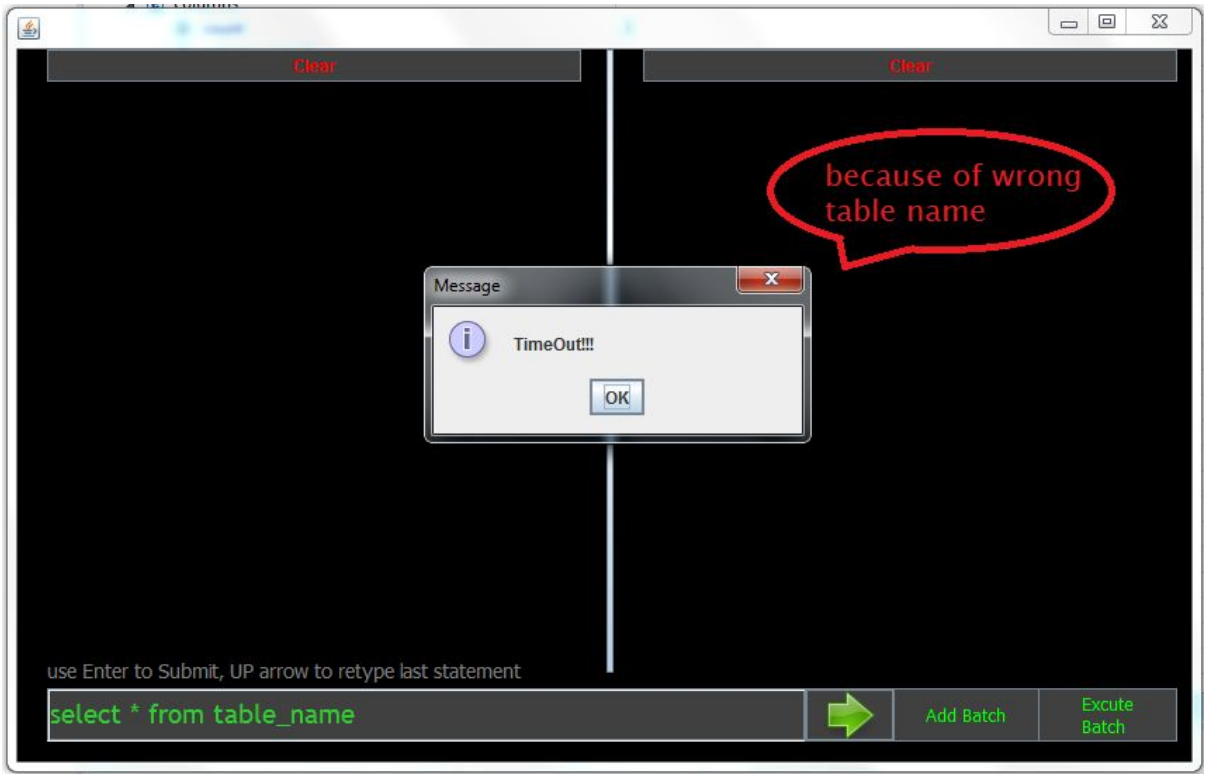
- The thread an exception when the execution of the query is timeout.
- You must leave space after the command word (‘insert’ , ‘select’, etc).

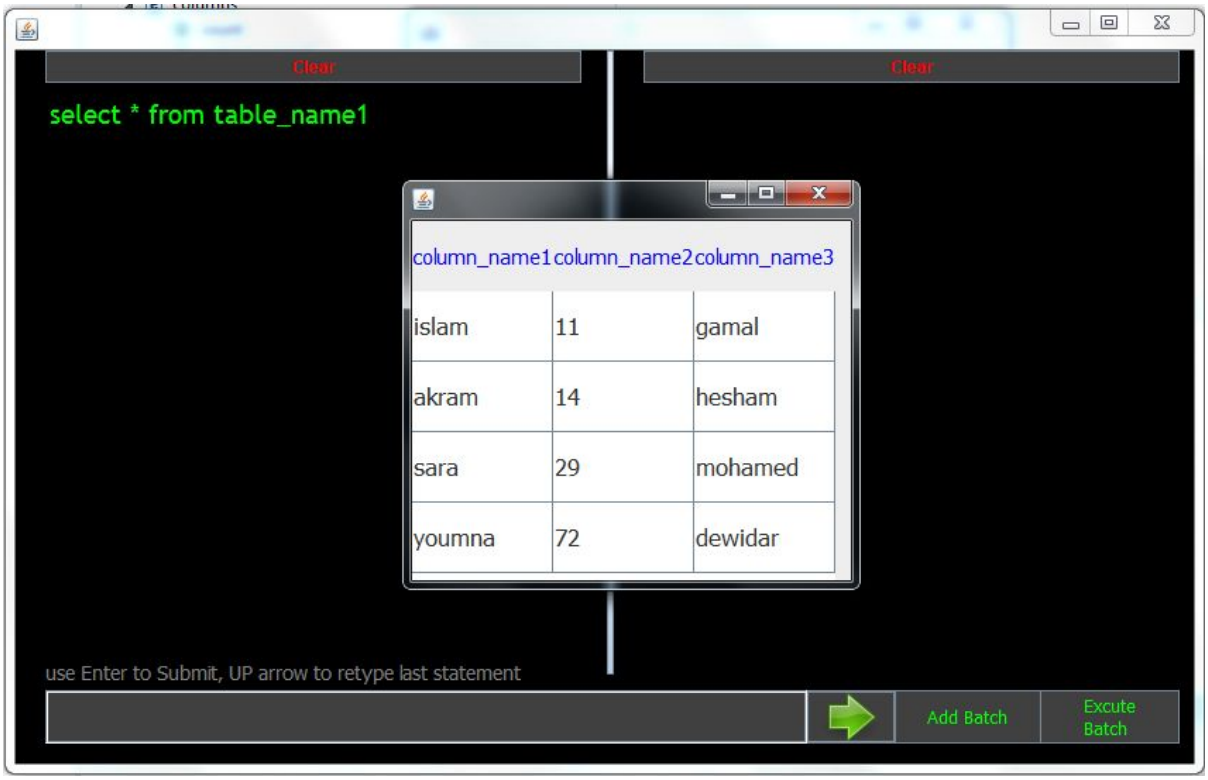
Screenshots



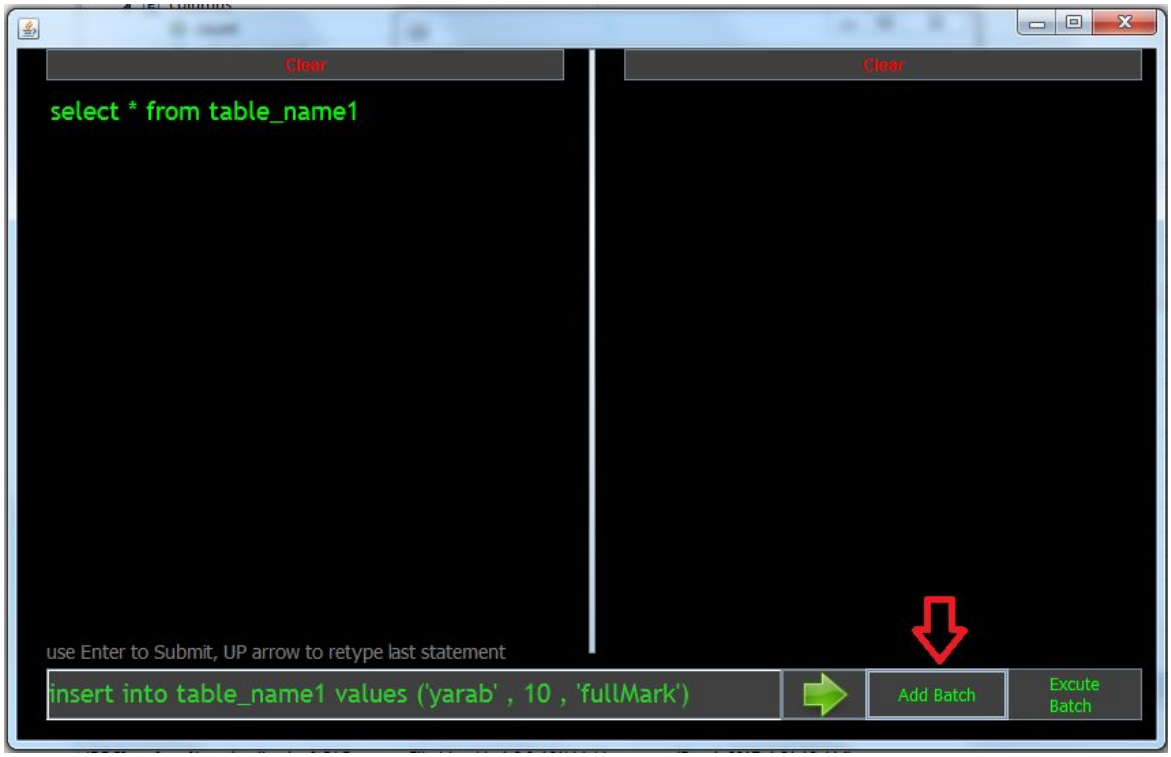


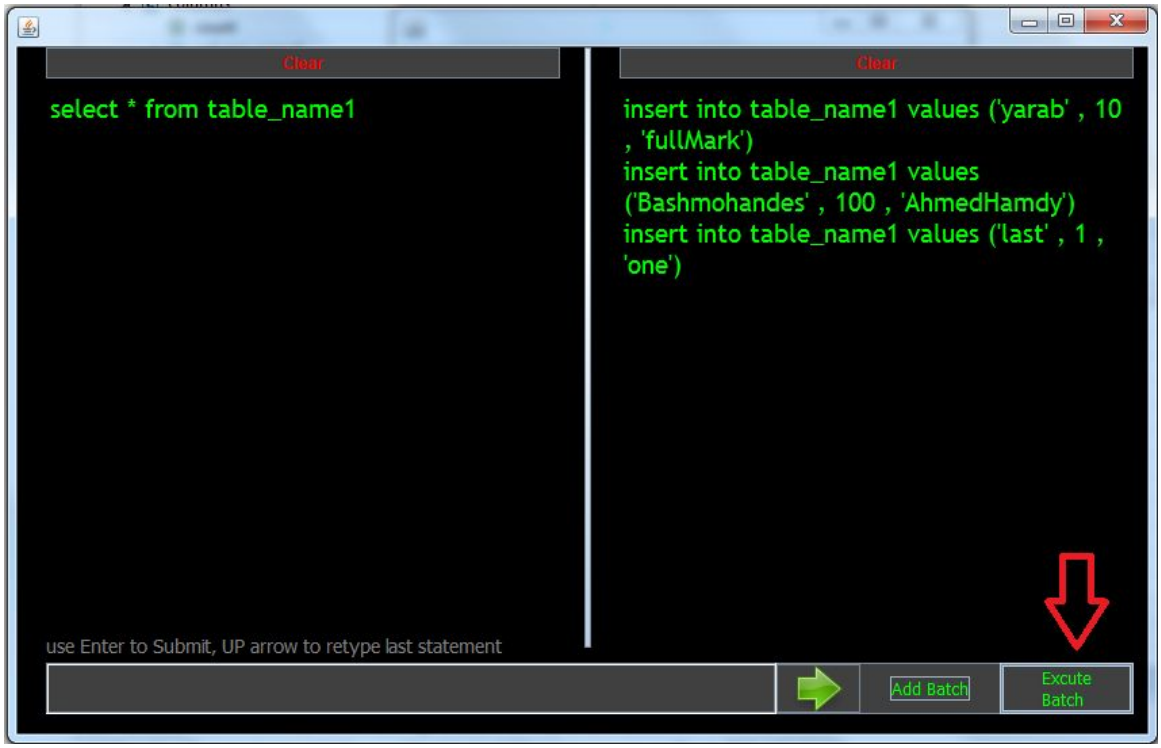
Node	Content
?-? xml	version="1.0" encoding="ISO-8859-1"
◢ e table_name1	
◢ e columns	
ⓐ count	3
◢ e column_name1	
ⓐ type	varchar
◢ e column_name2	
ⓐ type	int
◢ e column_name3	
ⓐ type	varchar
◢ e elements	
ⓐ count	3
◢ e element	
e column_name1	'islam'
e column_name2	11
e column_name3	'gamal'
◢ e element	
e column_name1	'akram'
e column_name2	14
e column_name3	'hesham'
◢ e element	
e column_name1	'sara'
e column_name2	29
e column_name3	'mohamed'
◢ e element	
e column_name1	'youmna'
e column_name2	72
e column_name3	'dewidar'

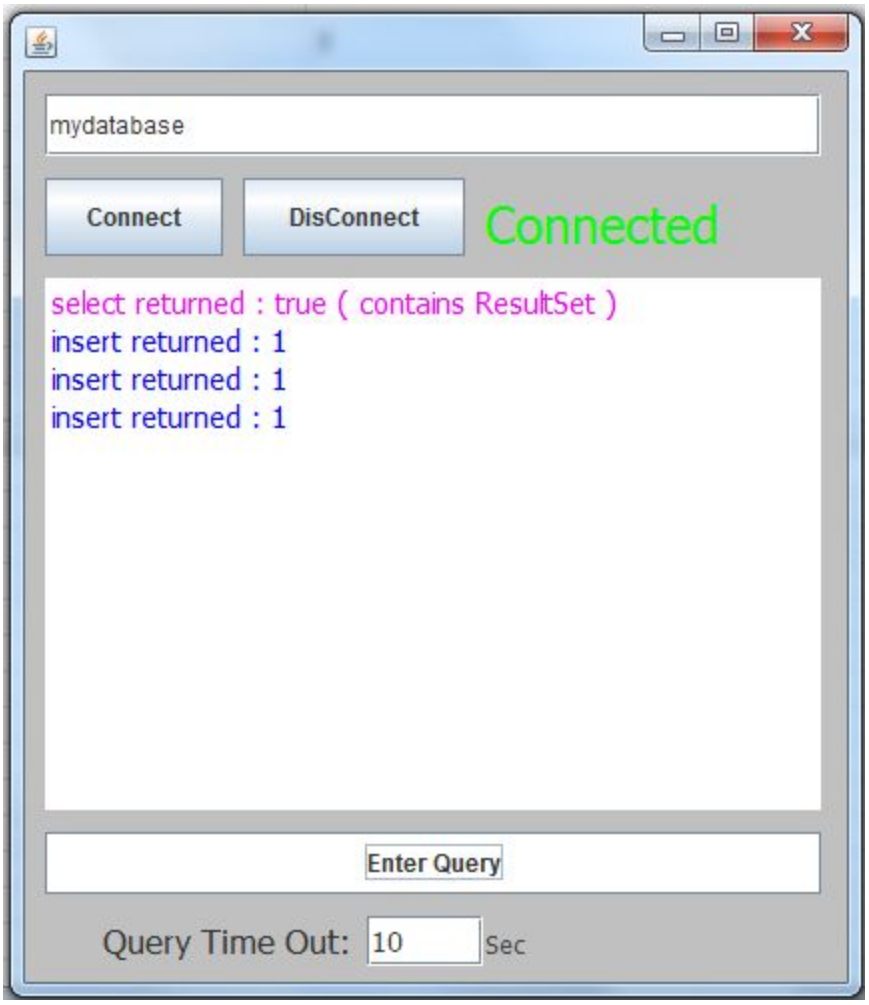

Clear
Clear
because of wrong table name
Message
TimeOut!!!
OK
use Enter to Submit, UP arrow to retype last statement
select * from table_name
Add Batch
Excute Batch


Clear
Clear
select * from table_name1
column_name1 column_name2 column_name3
islam 11 gamal
akram 14 hesham
sara 29 mohamed
youmna 72 dewidar
use Enter to Submit, UP arrow to retype last statement
Add Batch
Excute Batch

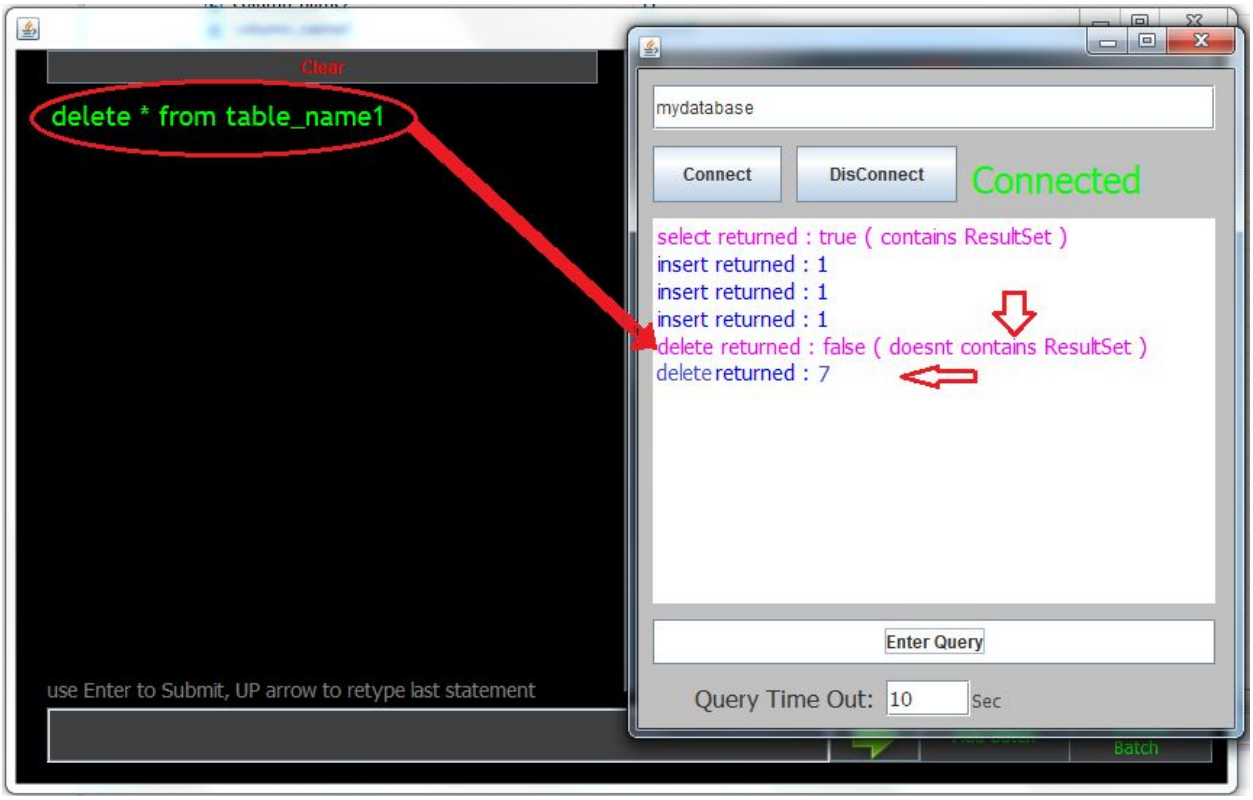

mydatabase
Connect
DisConnect
Connected
select returned : true (contains ResultSet)
Enter Query
Query Time Out:
10
Sec


Clear
Clear
select * from table_name1
use Enter to Submit, UP arrow to retype last statement
insert into table_name1 values ('yarab' , 10 , 'fullMark')
Add Batch
Excute Batch

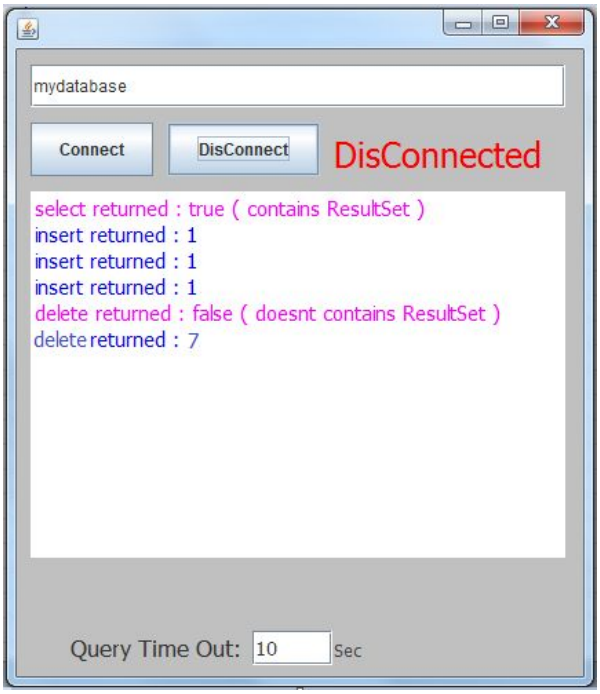

Clear
Clear
select * from table_name1
insert into table_name1 values ('yarab' , 10 , 'fullMark')
insert into table_name1 values ('Bashmohandes' , 100 , 'AhmedHamdy')
insert into table_name1 values ('last' , 1 , 'one')
use Enter to Submit, UP arrow to retype last statement
Add Batch
Excute Batch


mydatabase
Connect
DisConnect
Connected
select returned : true (contains ResultSet)
insert returned : 1
insert returned : 1
insert returned : 1
Enter Query
Query Time Out:
10
Sec

Node	Content
element	
column_name1	'islam'
column_name2	11
column_name3	'gamal'
element	
column_name1	'akram'
column_name2	14
column_name3	'hesham'
element	
column_name1	'sara'
column_name2	29
column_name3	'mohamed'
element	
column_name1	'youmna'
column_name2	72
column_name3	'dewidar'
element	
column_name1	'yarab'
column_name2	10
column_name3	'fullmark'
element	
column_name1	'bashmohandes'
column_name2	100
column_name3	'ahmedhamdy'
element	
column_name1	'last'
column_name2	1
column_name3	'one'



Node	Content
?-? xml	version="1.0" encoding="ISO-8859-1"
table_name1	
columns	
count	3
column_name1	
column_name2	
column_name3	
elements	
count	0




```
106 2017-12-04 00:26:50 INFO  JDBCInterface:131 - Excute Statement
107 2017-12-04 00:26:50 INFO  JDBCInterface:370 - Thread started
108 2017-12-04 00:26:50 INFO  JDBCInterface:252 - Excute Query
109 2017-12-04 00:27:15 INFO  JDBCInterface:79 - Connection created
110 2017-12-04 00:27:17 INFO  JDBCInterface:44 - Satement created
111 2017-12-04 00:27:17 INFO  JDBCInterface:351 - QueryTimeout set
112 2017-12-04 00:27:17 INFO  JDBCInterface:44 - Satement created
113 2017-12-04 00:27:17 INFO  JDBCInterface:351 - QueryTimeout set
114 2017-12-04 00:27:37 INFO  JDBCInterface:131 - Excute Statement
115 2017-12-04 00:27:37 INFO  JDBCInterface:370 - Thread started
116 2017-12-04 00:27:37 INFO  JDBCInterface:289 - Excute Update
117 2017-12-04 00:27:37 INFO  JDBCInterface:155 - Thread ended
118 2017-12-04 00:28:13 INFO  JDBCInterface:66 - addBatch
119 2017-12-04 00:28:14 INFO  JDBCInterface:208 - Excute Batch
120 2017-12-04 00:28:14 INFO  JDBCInterface:370 - Thread started
121 2017-12-04 00:28:14 INFO  JDBCInterface:289 - Excute Update
122 2017-12-04 00:28:14 INFO  JDBCInterface:216 - Thread ended
123 2017-12-04 00:28:14 INFO  JDBCInterface:100 - Statement closed
124 2017-12-04 00:30:32 INFO  JDBCInterface:67 - info
125 2017-12-04 00:30:32 WARN  JDBCInterface:68 - warn
126 2017-12-04 00:30:36 INFO  JDBCInterface:79 - Connection created
127 2017-12-04 00:30:37 INFO  JDBCInterface:44 - Satement created
128 2017-12-04 00:30:37 INFO  JDBCInterface:351 - QueryTimeout set
129 2017-12-04 00:30:37 INFO  JDBCInterface:44 - Satement created
130 2017-12-04 00:30:37 INFO  JDBCInterface:351 - QueryTimeout set
131 2017-12-04 00:30:51 INFO  JDBCInterface:131 - Excute Statement
132 2017-12-04 00:30:51 INFO  JDBCInterface:289 - Excute Update
133 2017-12-04 00:30:51 INFO  JDBCInterface:370 - Thread started
134 2017-12-04 00:30:51 INFO  JDBCInterface:294 - Thread ended
135 2017-12-04 00:31:03 INFO  JDBCInterface:66 - addBatch
136 2017-12-04 00:31:04 INFO  JDBCInterface:208 - Excute Batch
137 2017-12-04 00:31:04 INFO  JDBCInterface:370 - Thread started
138 2017-12-04 00:31:04 INFO  JDBCInterface:289 - Excute Update
139 2017-12-04 00:31:04 INFO  JDBCInterface:370 - Thread started
140 2017-12-04 00:31:04 INFO  JDBCInterface:294 - Thread ended
141 2017-12-04 00:31:04 INFO  JDBCInterface:216 - Thread ended
142 2017-12-04 00:31:04 INFO  JDBCInterface:100 - Statement closed
143 2017-12-04 00:31:38 INFO  JDBCInterface:44 - Satement created
144 2017-12-04 00:31:38 INFO  JDBCInterface:351 - QueryTimeout set
145 2017-12-04 00:31:38 INFO  JDBCInterface:44 - Satement created
146 2017-12-04 00:31:38 INFO  JDBCInterface:351 - QueryTimeout set
147 2017-12-04 00:31:41 INFO  JDBCInterface:66 - addBatch
```

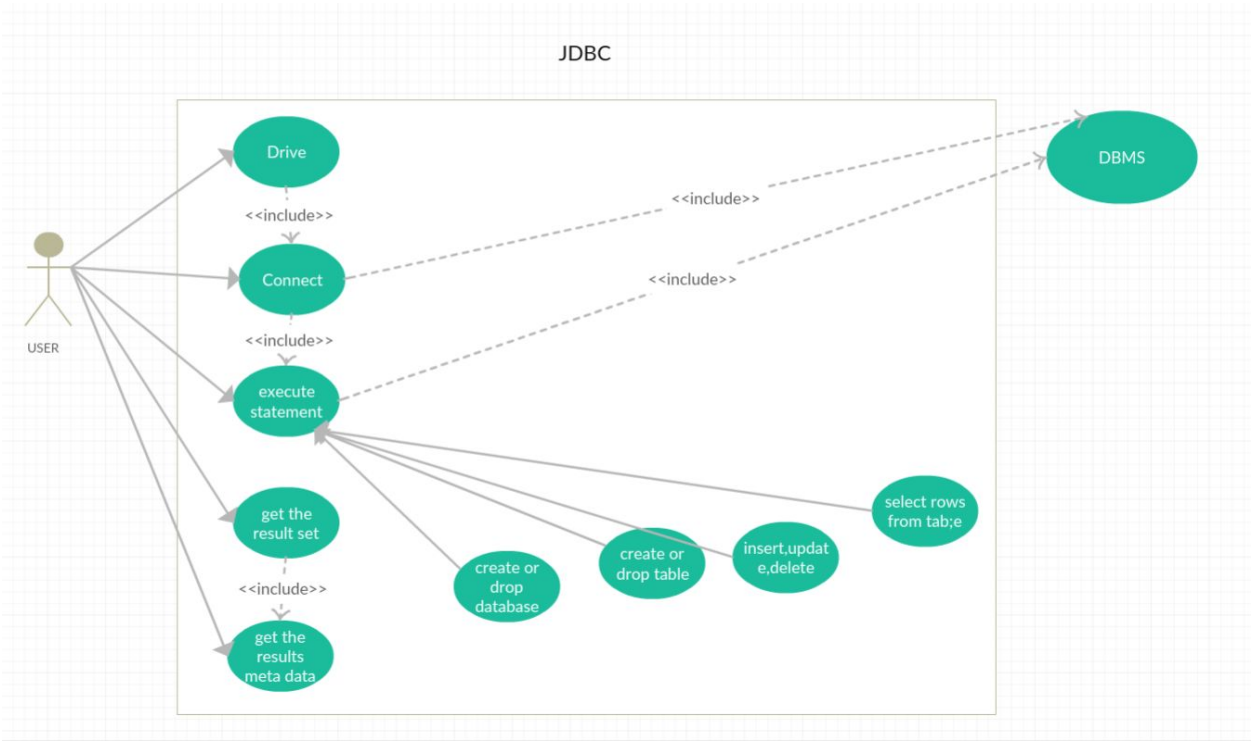
Sample of Process Log

UML Class Diagram

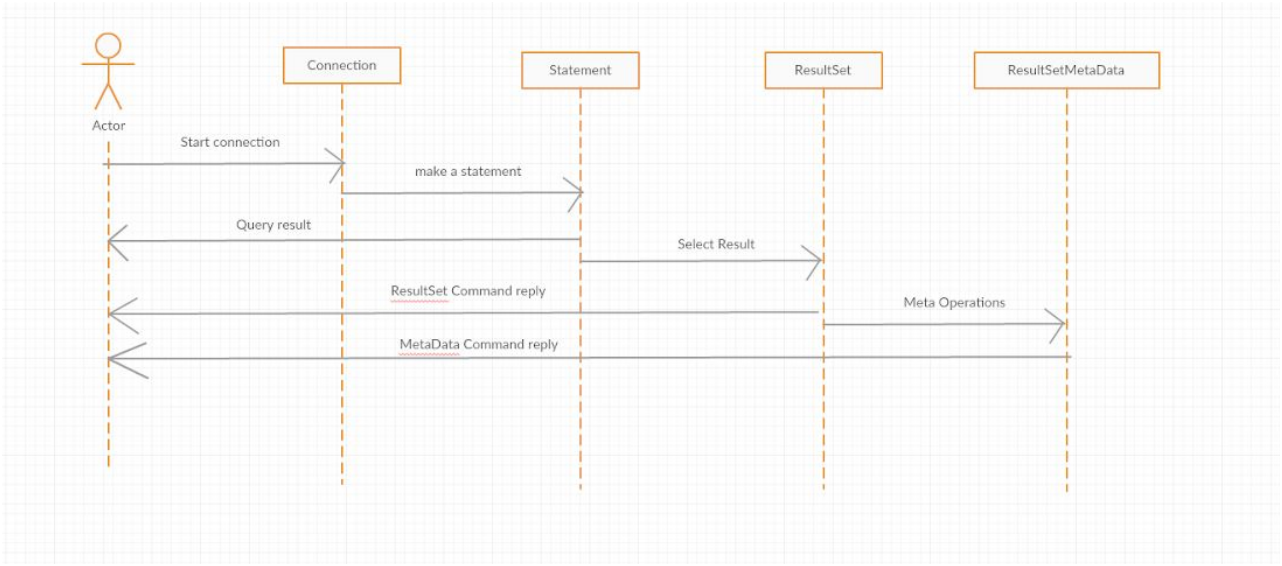
DBMS Link : https://drive.google.com/open?id=1dHHFO14nvdaNH6Z9IkwBCb_ZZpqUy0Bv

JDBC Link : https://drive.google.com/open?id=1slfsQRJebtQxMK6QLh8_EPH9KUmppW-T

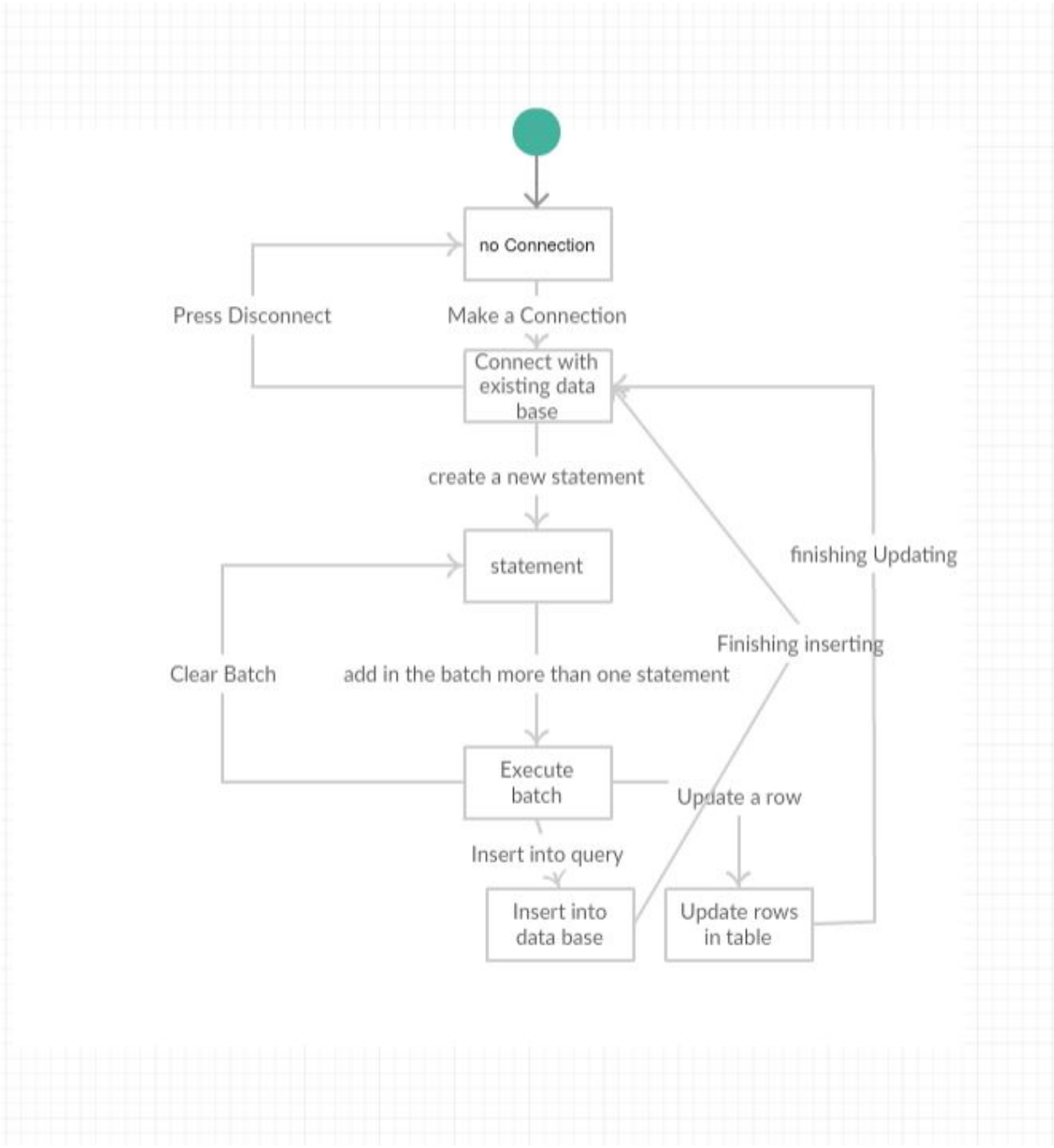
UML Use Case

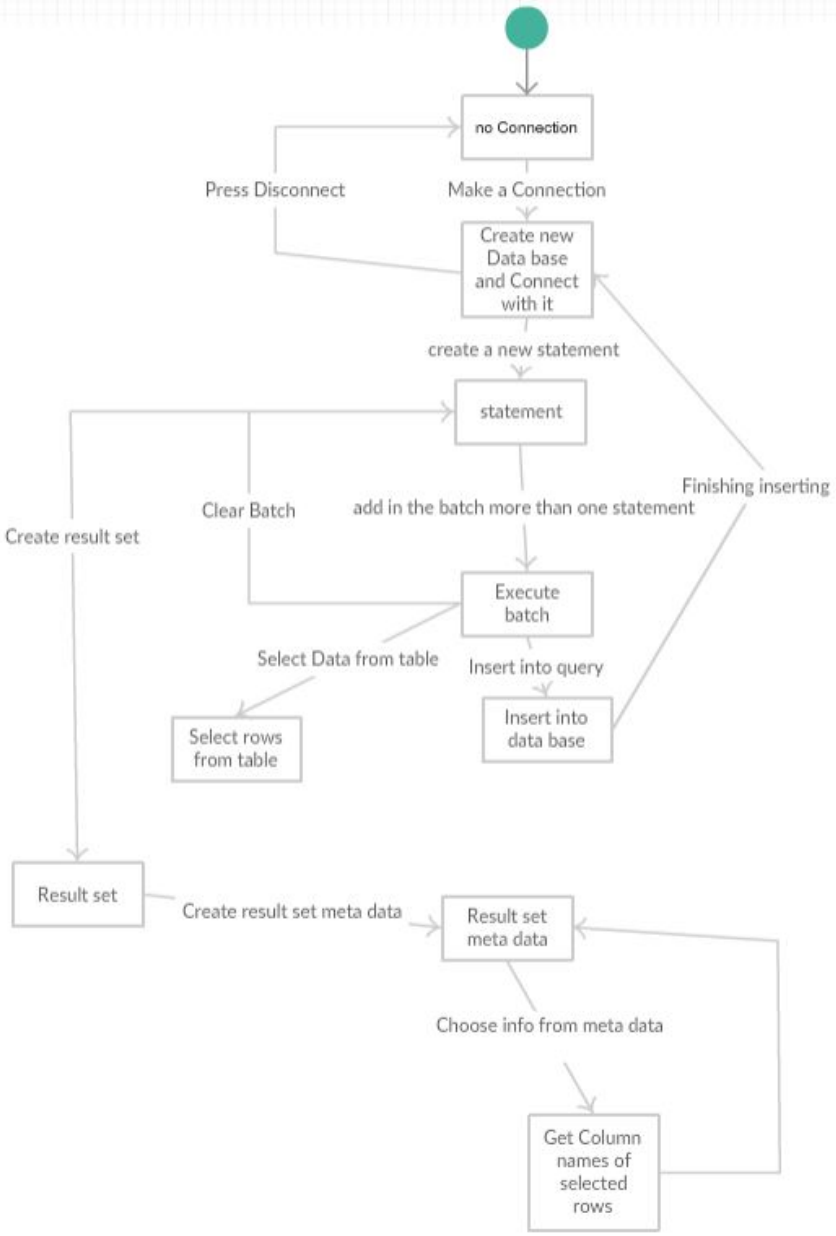


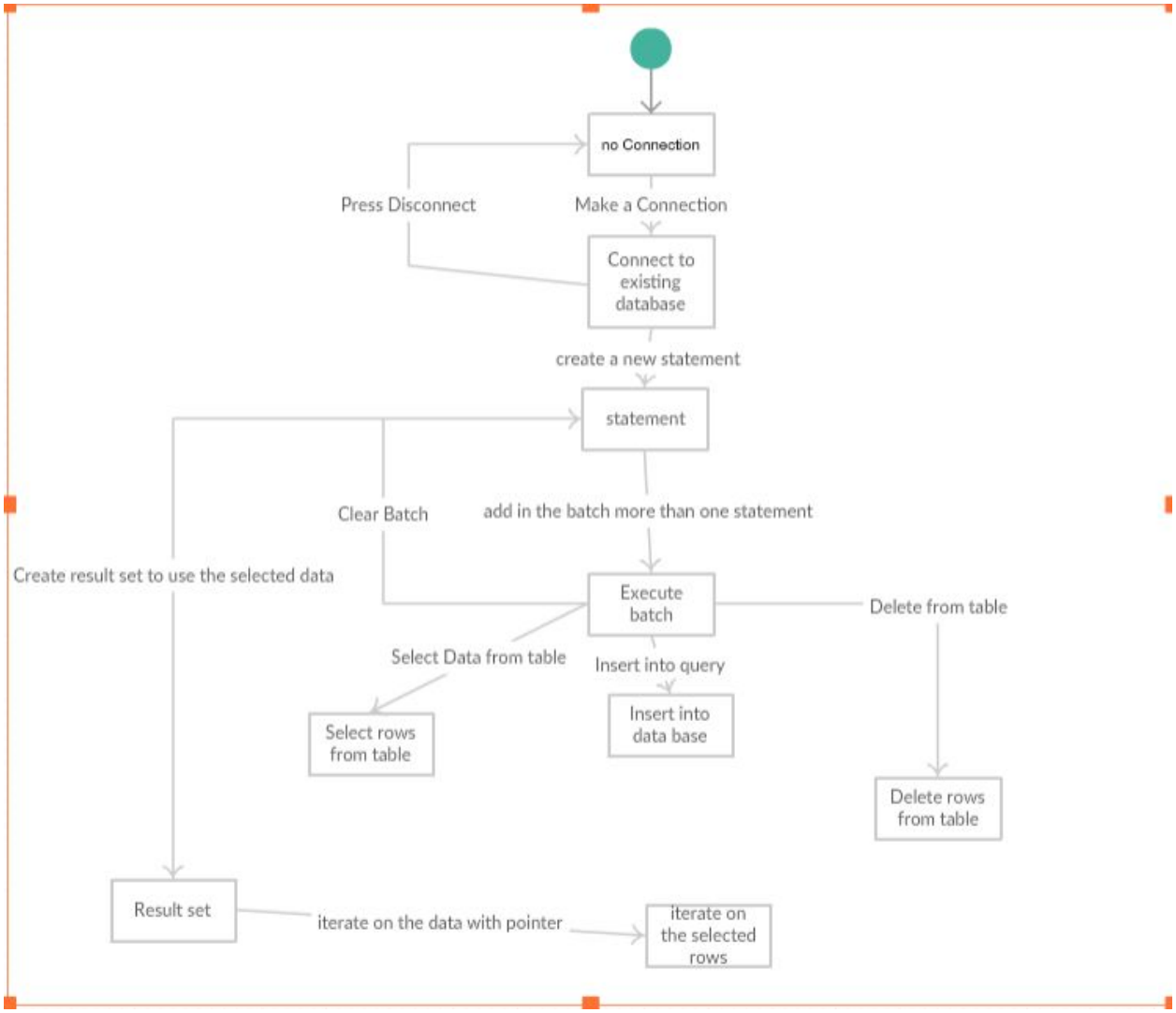
UML Sequence Diagram



UML State Diagram:




no Connection
Press Disconnect
Make a Connection
Create new Data base and Connect with it
create a new statement
statement
Finishing inserting
Clear Batch
add in the batch more than one statement
Create result set
Execute batch
Select Data from table
Insert into query
Select rows from table
Insert into data base
Result set
Create result set meta data
Result set meta data
Choose info from meta data
Get Column names of selected rows



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