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Lab Title: Java Database Connectivity

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Computer and Systems Engineering Department

1 Introduction

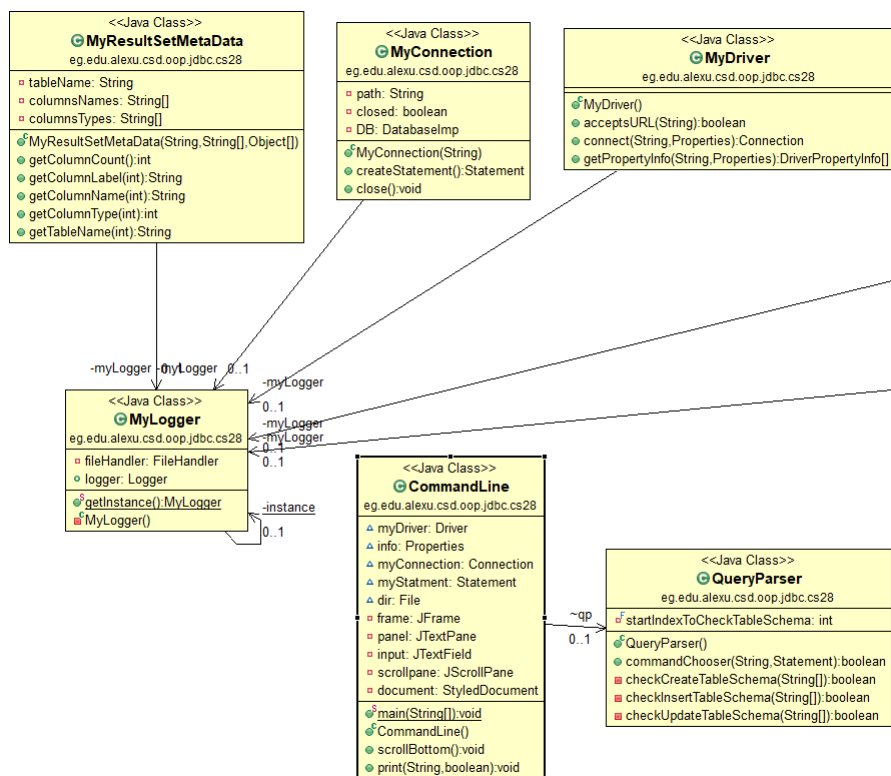
Java Database Connectivity (JDBC) provides Java developers with a standard API that is used to access databases, regardless of the driver and database product. JDBC presents a uniform interface to databases - change vendors and your applications only need to change their driver.

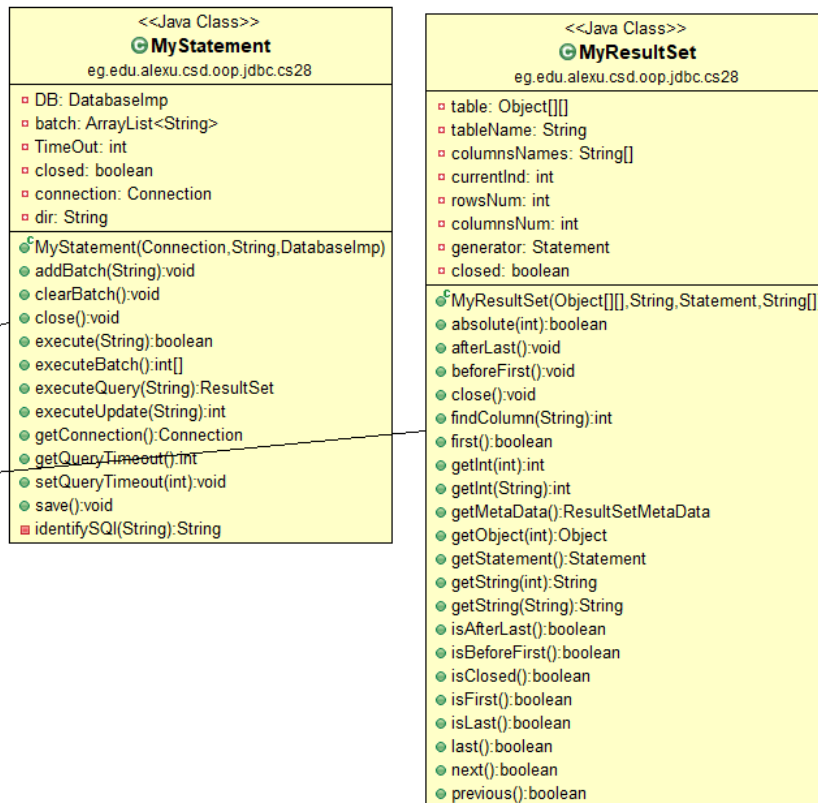
2 UML Diagrams

2.1 Use Case

2.2 State Diagrams

2.3 Detailed Class Diagram





2.4 Sequence Diagram

3 Design

****Design decisions are bold****

Assumptions are italic

3.1 Driver

1. For establishing a connection it needs to check if the URL is acceptable according to the format "jdbc:xmlodb://localhost" and that properties contains valid path.
2. It collects the property info through the key set of Properties.

3.2 Connection

1. Once a successful connection is established it creates an instance of the driver implementation which is sent to the statement for executing queries by create Statement.
2. It contains a Boolean which indicates if the connection is open or closed.

3.3 Taking Queries from User

- SQL queries are sent to class QueryParser which checks the validity of the statement.
- Valid statements are sent to the appropriate method.

3.4 SQL Statements Execution

- Execute Structure Queries:
 1. Send the SQL statement to the method responsible for structure queries in the DBMS.
- Execute Select Queries:
 1. Send the SQL statement to the method responsible for select queries in the DBMS.
- Execute Update Queries:
 1. Send the SQL statement to the method responsible for update queries in the DBMS.

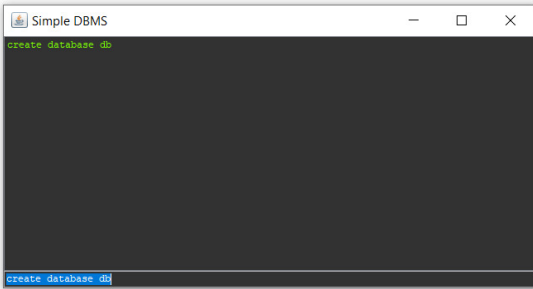
3.5 Result Set

- After executing a select query successfully and the return is not null.
- A result set object is created with these information send to the constructor:
 1. A 2D array of objects which contain the table data.
 2. The table name.
 3. An array of the columns' names.
- One of the methods of the result set class creates an object of result set meta data and these information are passed to the constructor:
 1. The table name.
 2. An array of the columns' names.
 3. A row from the table itself.

4 Sample Runs

Name

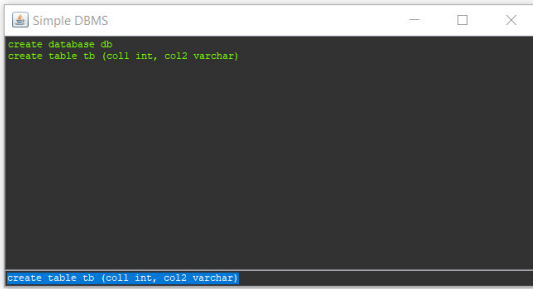
db



```
Simple DBMS
create database db
create database db
```

Name

tb.dtd
tb.xml

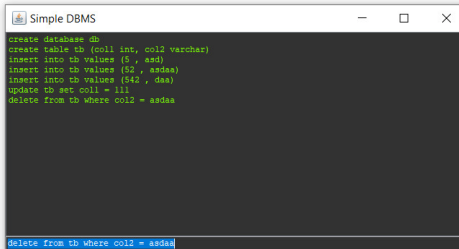


```
Simple DBMS
create database db
create table tb (col1 int, col2 varchar)
create table tb (col1 int, col2 varchar)
```

tb.xml - Notepad

File Edit Format View Help

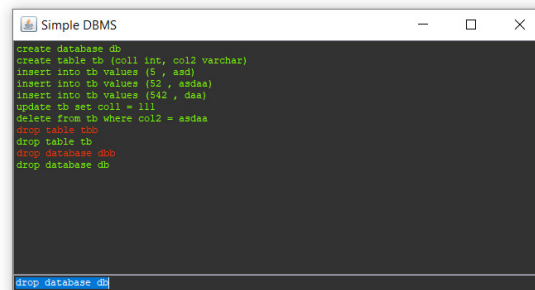
```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE table SYSTEM "tb.dtd">
<table col1="int" col2="varchar">
  <row>
    <col1>111</col1>
    <col2>asd</col2>
  </row>
  <row>
    <col1>111</col1>
    <col2>daa</col2>
  </row>
</table>
```



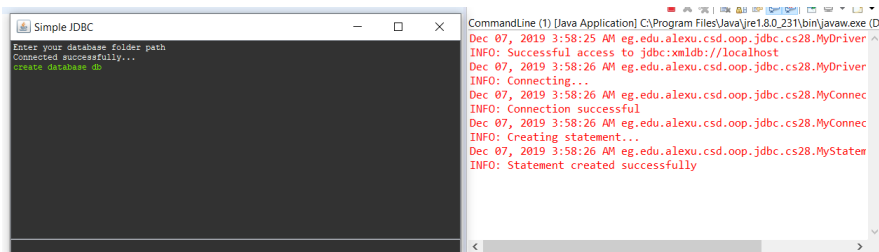
```
Simple DBMS
create database db
create table tb (col1 int, col2 varchar)
insert into tb values (1 , asd)
insert into tb values (12 , asdaa)
insert into tb values (142 , daa)
update tb set col1 = 111
delete from tb where col2 = asdaa
delete from tb where col2 = asdaa
```

Name

This folder is empty.



```
create database db
create table tb (col1 int, col2 varchar)
insert into tb values (5, asd)
insert into tb values (52, asdas)
insert into tb values (542, das)
update tb set col1 = 111
delete from tb where col2 = asdas
drop table tbo
drop table tb
drop database dbb
drop database db
drop database db
```



```
Simple JDBC
Enter your database folder path
Connected successfully...
create database db

CommandLine (1) [Java Application] C:\Program Files\Java\jre1.8.0_231\bin\javaw.exe (D
Dec 07, 2019 3:58:25 AM eg.edu.alexu.csd.oop.jdbc.cs28.MyDriver
INFO: Successful access to jdbc:xml:db://localhost
Dec 07, 2019 3:58:26 AM eg.edu.alexu.csd.oop.jdbc.cs28.MyDriver
INFO: Connecting...
Dec 07, 2019 3:58:26 AM eg.edu.alexu.csd.oop.jdbc.cs28.MyConnec
INFO: Connection successful
Dec 07, 2019 3:58:26 AM eg.edu.alexu.csd.oop.jdbc.cs28.MyConnec
INFO: Creating statement...
Dec 07, 2019 3:58:26 AM eg.edu.alexu.csd.oop.jdbc.cs28.MyStatem
INFO: Statement created successfully
```