CIS611
Summer Session 2016
Individual Programming Assignment: PA06

Due: Thursday, July 07, 2016 by 11:59 pm

Total Points: 20

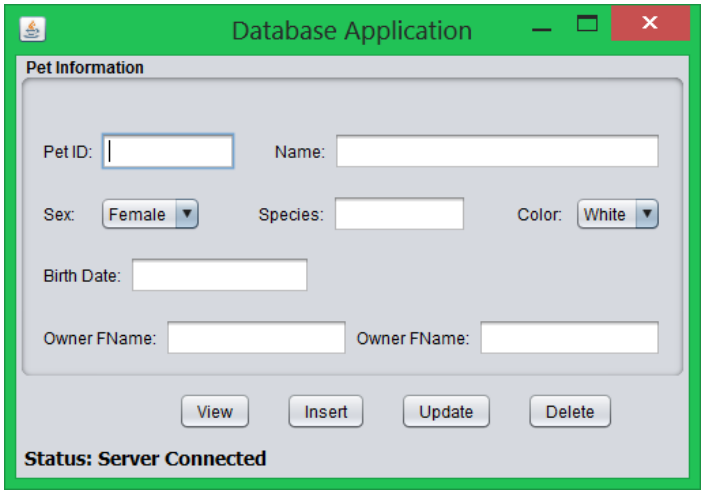
Week 07: Java Client-Server Database Programming:

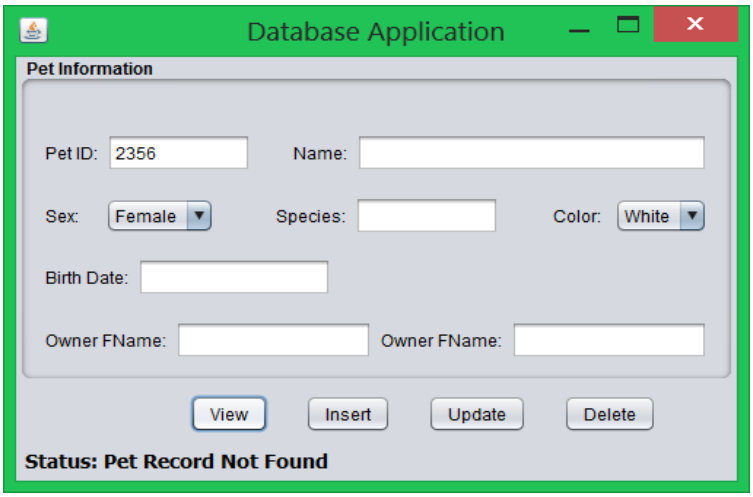
Q1 (20 points)**:**
This assignment has two parts:

Part I: The *localhost* MySQL Database installation and instantiation.

- Download WAMP Server (http://www.wampserver.com/) for Windows, or LAMP Server (https://bitnami.com/stack/lamp/installer) for Linux, in order to create a *localhost* MySQL database server in your personal machine. You can create/manage your MySQL database and tables by opening the phpMyAdmin page from the W/LAMP server in the IE or Chrome browser. Alternatively, download a free MySQL Workbench visual tool (https://www.mysql.com/products/workbench/) to create your MySQL database and tables. MySQL Workbench is a visual tool that provides data modeling, SQL development, and comprehensive administration tools for server configuration, user administration, and much more. MySQL Workbench tool is available on Windows, Linux and Mac OS X.
- For using the free MySQL Workbench visual tool for database architects, developers, and DBAs:
    - Use the following tutorial link to creating a new MySQL Connection: https://dev.mysql.com/doc/workbench/en/wb-getting-started-tutorial-create-connection.html
    - Use the following tutorial link to create a new scheme model (your assignment database and tables, you must name your scheme model (in your local MySQL database as **"MyDatabase"**): https://dev.mysql.com/doc/workbench/en/wb-getting-started-tutorial-creating-a-model.html

Part II: Develop a Java Client/Server application to manipulate data in your local MySQL database. The program applies the 3-tier database application architecture. With the 3-tier model, the client interacts with the database server via the server application. The Java client program displays Swing GUI with four buttons to perform view, insert, update, and delete pet information stored locally in MySQL database named **"MyDatabase".** The client GUI layout is presented below. The view button displays a pet record based on the pet ID specified in the GUI textfield component. Once a user clicks on a button, the client program sends the pet data along with the operation type to the server as a serializable message object. User input format must be validated before being sent to the server program.





The Pet table is created in the MySQL database server as follows:

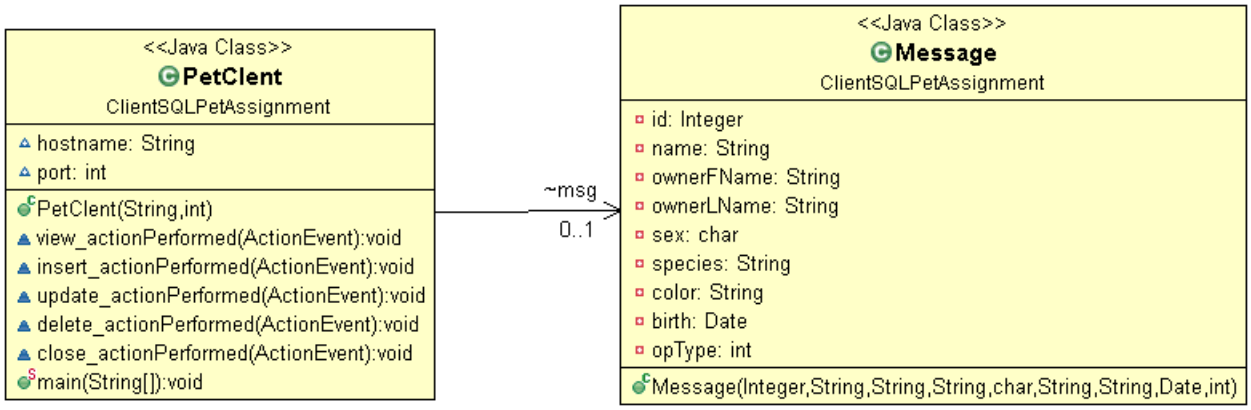
```
create table Pet (
  id int not null,
  name varchar(20) not null,
  owner_firstName varchar(15) not null,
  owner_lasttName varchar(15) not null,
  sex char(1) not null,
  species varchar(20),
  birth Date not null,
  color char(15) not null,
  primary key (id)
);
```

The server application program is a multithreaded server (can open socket connections with multiple clients simultaneously) receives serializable message objects from a client program and performs the view, insert, update, and delete operations on the MySQL database server. In order to connect your server program to your "localhost" MySQL database server, you must configure the class path in your project to point to the External JARs Connecter/J file: mysql-connector-java-5.1.24-bin.jar, which is given in the week 07 practice examples folder. In the server program, you must load the MySQL driver and establish a connection to your **"MyDatabase"** database in the "localhost" MySQL server as follows:

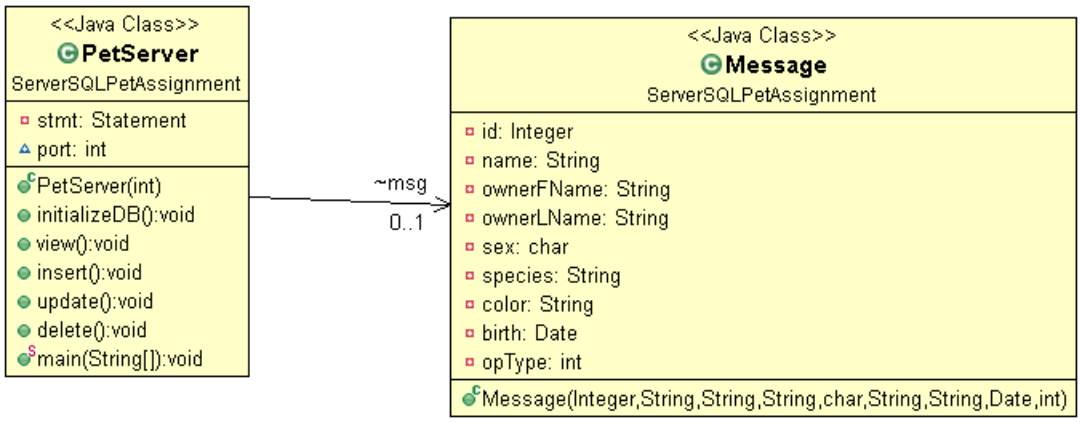
```
  // Load the JDBC driver
     Class.forName("com.mysql.jdbc.Driver");
     System.out.println("Driver loaded");

// Establish a connection
    Connection connection = DriverManager.getConnection
    ("jdbc:mysql://localhost/mydatabase", "root", "");
     System.out.println("Database connected\n");
```

The program must be impended with exact classes and methods (names and signatures) as shown in the following class diagrams (A) and (B):



(A) UML Classdiagram for the Client Side Programs



(B) UML Classdiagram for the Server Side Programs

Hint: *Review the provided practice code examples for week 06, such as the Java source files in the database and MySQL Database Project folders. Also, review the provided MySQL links in the Java Resources page in Canvas in order to write SQL statements (Select, Insert, Update, and Delete) for manipulating Pet table in your "MyDatabase" defined in the localhost MySQL server.*

Evaluation Criteria:

1. You must use the class template in your program classes
2. The program must not have any compilation or runtime errors
3. You must use the 3-Tier application database model
4. You must implement the service-oriented model employing a request-response protocol
5. You must use java.net.* package

6. All tasks must be completed to receive a complete credit for this assignment
7. The program must perform all the requirements correctly, including the read and output of data from a user
8. The program must handle incorrect data format and required inputs
9. The program must have a correct logical order and produce the anticipated results
10. The sequence, selection, and iteration structures must constitute correct program logic solutions to the assignment problem
11. The program must terminate gracefully
12. The program must not abnormally abort
13. You must follow the correct submissions format as described in this document

Submission: (This is an individual Assignment!)

Copy the .java source files from the *src* folder in your *work space* to another folder that should be named following the provided naming format in this course, then zip and upload the file under this assignment answer in Canvas.

File Name: *FFFFLLLLPA06.zip (FFFF = your first name and LLLL = your last name)*